MINISTRY OF RURAL DEVELOPMENT AND FOOD
DIRECTORATE GENERAL FOR FISHERIES
HELLENIC AGRICULTURAL ORGANISATION-DIMITRA

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 27 April 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 27 April 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) 2022/39 of 12 January 2022

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

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

2022

Version 3

Athens, 31 May 2023

CONTENTS

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.

Outline the general framework of the national data collection programme in relation to the relevant sections of the EU MAP. If applicable, indicate major methodological changes in approach compared to previous year(s), and to which section(s) they apply.

The Data Collection Programme is co-ordinated by the Directorate General for Fisheries, Ministry of Rural Development and Food, under the national correspondent Mr. Kostas Katsafaros. His substitute, in case of absence, is Dr. Michael Chatziefstathiou **(**mchatzief@minagric.gr)**,** head of the Department of Common Fisheries Policy & Common Market Organisation.

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The Data Collection Programme for Greece is carried out by two partners, the Hellenic Agricultural Organisation – DIMITRA (ELGO DIMITRA) which is the project Co-ordinator and the Hellenic Centre for Marine Research (H.C.M.R.). From the ELGO DIMITRA, a semi state research organisation, participate the Fisheries Research Institute (F.R.I) that is the project's Scientific Co-ordinator, and the Agricultural Economics Research Institute (AGR.E.R. I) (see Table 1). The FRI, is a research istitution responsible for collecting scientific data on the fisheries sector in the North and Central Aegean Sea, on eel, on processing and on the aquaculture industry. The AGR.E.R.I is responsible for collecting and analysing economic and social data on the fisheries sector. From H.C.M.R. participate the Institute of Marine Biological Resources and Inland Waters (I.M.B.R.I.W.) based in Athens and Crete. The I.M.B.R.I.W is a semi state marine research institution responsible for the collection of scientific data on the fisheries sector in South Aegean Sea, Ionian Sea and Cretan Sea. All data are stored in local databases and feed the National Data Base.

Give full name, acronym and contact details of all institutes that contribute to the data collection activities, and describe briefly their role in the work plan.

The contact details of the participating institutes are:

HELLENIC AGRICULTURAL ORGANIZATION – DIMITRA
Co-ordinating organization
Address: 56-58 Kourtidou & Nirvana Aven., 11145 Athens, GREECE
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E-mail : gendiresearch@elgo.gr

FISHERIES RESEARCH INSTITUTE (F.R.I)-ELGO DIMITRA
Scientific Co-ordinator
Address: 64007 N. Peramos, Kavala, GREECE
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E-mail: inale@elgo.gr, manosk@inale.gr;
web-site: http://www.inale.gr
Scientific Responsible: Dr. Manos Koutrakis

AGRICULTURAL ECONOMICS RESEARCH INSTITUTE (AGR.E.R.I)-ELGO DIMITRA
Address: Terma Alkmanos, str,
115 28, Ilisia, Athens, GREECE
Tel. +30-210-2756596
Email: tzouramani@elgo.gr
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Scientific Responsible: Dr. EiriniTzouramani

HELLENIC CENTRE FOR MARINE RESEARCH (H.C.M.R.)
Scientific Responsible: Dr. Giorgos Tserpes
Email: gtserpes@hcmr.gr

Institute of Marine Biological Resources& Inland Waters (I.M.B.R.I.W)-Athens
Address: 46.7 km Athens-Sounio, P.O Box 712,
190 13 Anavissos Attica Greece
Tel.: +30 210 9856702

Provide a link to the national data collection website, if there is one.

A web page on Data Collection Programme for Greece, has been developed under the premises of the Ministry of Rural Development & Food. Web link is: http://www.alieia.minagric.gr/node/20

Table 1. National data collection organization	
SECTIONS	**RESPONSIBLE INSTITUTES**
SECTION 1: GENERAL INFORMATION	
Data collection framework at national level	**FRI - HCMR-AGR.E.R.I**
1.1: Data availability	**FRI - HCMR-AGR.E.R.I**
1.2: International coordination	**FRI - HCMR-AGR.E.R.I**
Other data collection activities	**FRI - HCMR-AGR.E.R.I**
Section 2: Biological Data	
2.1: List of required stocks	**FRI - HCMR**
2.2: Planning of sampling for biological variables	**FRI - HCMR**
2.3: Diadromous species data collection in freshwater	**FRI**
2.4: Recreational fisheries	**FRI - HCMR**
2.5: Sampling plan description for biological data	**FRI - HCMR**
2.6: Research surveys at sea MEDITS	**FRI - HCMR**
2.6: Research surveys at sea MEDIAS	**HCMR**
Section 3: Fishing Activity Data	
3.1: Fishing activity variables data collection strategy	**FRI - HCMR-AGR.E.R.I**
3.2: Fishing activity variables data collection strategy (inland eel commercial fisheries)	**FRI**
Section 4: Impact of fisheries on marine biological resources	
4.1: Stomach sampling and analysis	**FRI - HCMR**
4.2: Incidental catches of sensitive species	**FRI – HCMR**
4.3: Fisheries iImpact on marine habitats	**FRI - HCMR**
Section 5: Economic and Social Data in fisheries	
5.1: Fleet total population and clustering	**AGR.E.R.I**
5.2: Economic and social variables for fisheries data collection strategy	**AGR.E.R.I**
Section 6: Economic and Social Data in aquaculture	
6.1: Economic and social variables for aquaculture data collection	**FRI**
Section 6: Economic and Social Data in fish processing	
7.1: Economic and social variables for fish processing data collection	**FRI**
Data Quality	
ANNEX 1.1 - Quality report for biological data sampling scheme	**FRI - HCMR**
ANNEX 1.2 - Quality report for socioeconomic data sampling scheme	**AGR.E.R.I-FRI**

(max. 1000 words)

Text Box 1a: Test studies description

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.

Name of the study: 1XXXXX

1. Aim of the test study

2. Duration of the test study

3. Methodology and expected outcomes of the test study

(max 900 words per study)

Name of the study: 1XXXXX

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

Achievement of the original expected outcomes of the study and justification if this was not the case.

Incorporation of study results into regular sampling by the Member State.

(max. 900 words per study)

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.

Name of the study: 2XXXXX

1. Aim of the test study

2. Duration of the test study

3. Methodology and expected outcomes of the test study

(max 900 words per study)

Name of the study: 2XXXXX

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

Achievement of the original expected outcomes of the study and justification if this was not the case.

Incorporation of study results into regular sampling by the Member State.

(max. 900 words per study)

Text Box 1b: Other data collection activities

General comment: 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.

Background

The project SecWeb (MARE2020-08) was setup with the aim of developing mechanisms to support the planning and execution of administrative tasks and the branding and online visibility of the Regional Coordination Groups (RCGs), with the aim to establish a long-term supportive structure (the RCGs' Secretariat). This was identified as a clear identified need in previous projects such as FishPi² and STREAM as well by all RCGs.

The activities committed by SecWeb are organised in four work packages:

- WP 1: **Setting up the secretariat in support to RCGs and ISSGs** (and running it as a pilot for at least NANSEA & Baltic RCGs for identifying insights that can strengthen the work of the broader network of RCGs)
- WP2: **Developing an operating a website** as a common entry point for all the stakeholders to better understand the role and structure of the RCGs, to enhance the use of the outcomes from their activities.
- WP3: **Ensuring future operation and funding** by analysing the past experiences and developing suitable business models for the long-term implementation of the secretariat service for the RCGs.
- WP4: **Communication and dissemination activities** to be progressively integrated into the RCGs strategy as a mean for promoting the visibility of the RCGs participants and experts and the engagement of all the relevant stakeholders.

Under the same funding framework, the EC also granted support and funding to the FISHN'CO project. FISHN'CO is addressing the needs to develop Regional Work Plans for RCGs NANSEA & Baltic, RCG Large Pelagics and RCG on Economics Issues. Synergy with SecWeb activities has been harnessed, on the one hand to guarantee consistency in dissemination and communication, but also in the way administrative support is provided to the RCGs and ISSGs' network.

1. Aim of the data collection activity

While the activities covered by the SECWEB project funds are for setting the basis for a long-term the RCG's Secretariat (including administrative support, communication and dissemination, and web maintenance) a continuity approach to this supporting structure implementation is essential for efficiency and for strengthening the regional cooperation in the context of the DCF.

The activity proposed is to ensure that a full-scale operation is adopted for the secretariat activities, without interruption, after the end of the implementation period of the SECWEB initiative

2. Duration of the data collection activity

01/01/2020 – 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 activities will be carried out consistently with the business models and scenarios found most suitable and acceptable by the Member States and the European Commission, as developed under SecWeb WP3. Consistently, the work of the RCGs' Secretariat beyond SecWeb implementation period should be built upon the outcomes from SecWeb and the services should reach all the RCGs. Given the different background and context of the RCGs, the working methodology for the Secretariat should enable some flexibility to adapt the service to the needs and specificities of each RCG, although in general terms the service lines and protocols will be shared and defined in common.

Overarching, the service lines to be consolidated will cover:

1. Maintenance and update of the RCGs website and of the shared virtual working area (including documents repository management).
2. Maintenance and implementation of a Dissemination and Communication Plan (the DCP needs to be yearly updated and validated by the RCG chairs).
3. Maintenance of the RCGs stakeholders' database.
4. Help-desk orientation for the RCG expert's network and for the stakeholders.
5. Direct support for the organisation of meetings and stakeholder events. Especially the annual RCG meetings, including preparation, administrative support during the meetings and for the corresponding reporting process. This includes also the Liaison Meeting (LM)
6. Follow-up of the intersessional work.
7. Track-record of activity, reporting and yearly fine tuning of the work plan for the Secretariat. (Internal and to guarantee accountability of the service)

Expected outcomes:

1. The provision of dedicated Secretariat support for the RCGs. A consistent approach to administering RCG activities, facilitating communication, helping to drive intersessional work and supporting the work of sub-groups would significantly improve the performance of the RCGs.

2. A dynamic and permanently updated website including as features:

✓ Integration –allow seamless synchronization with third-party applications.
✓ Responsive – to serve content across multiple screens and platforms.

- ✓ User experience- maintain a consistently good user experience throughout the website.
- ✓ Accessibility – All levels of society and end-users need to be able to access in a friendly used way the website.
- ✓ Retention- keep visitors coming back to the website.
- ✓ Links to protected part outside the website as repository for confidential documents

3. Consolidated and Visual identity for RCGs and enhanced visibility and understanding of the work by the RCGs at least by the relevant stakeholder groups, enhancing the pathways for interaction with them.

4. Regular updated Stakeholders' database useful for the RCG experts and for the stakeholders' community.

5. Internal communication protocols and help-desk in place making it easier for any new comer to efficiently join, adopt responsibilities, and contribute to the RCGs objectives and work commitments.

6. A detailed description of the secretariat functions, operational working protocols and the business model for the provision of Secretariat role.

(max 900 words per activity)

Name of the study: SecWeb

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).
Achievement of the original expected outcomes of the study and justification if this was not the case.
Incorporation of study results into regular sampling by the Member State.

During 2022 the activities of the RCGs Secretariat still developed in the context of the SecWeb Project, which was extended to last until the end of February 2023. The RCG experts and the Member States' NCs engaged in several discussions about the long-term stabilization of the Secretariat services, given the value added by the project to the RCGs networks, and agreed on a short-term solution for continuity in 2023 which was incorporated with a statement in "Text Box 1b: Other data collection activities" of the Annual Work Plans of the Member States. The longer-term perspective will build upon the outcomes from SECWEB and dealt with intersessionally and pan-regionally by ISSG NCs in 2023 and beyond.

(max. 900 words per study)

Text Box 2.1: List of required species/stocks

Region: Mediterranean and Black Sea

RFMO: GFCM

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 2.1(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.1.

Deviations from the work plan

List the deviations (if any) in the achieved data collection (lengths only) compared to what was planned. The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.1.

There were no deviations in the achieved data collection for lengths compared to what was planned. All species/stocks that were planned to be sampled for length under a commercial sampling plan were achieved. For the species selected also for sampling of the biological variables, more emphasis was placed on sampling and more samples were taken. In addition, species for which length sampling was not planned but was required by the GFCM or for national reasons were also recorded. Finally, the PET species whose length was recorded during the on-board sampling are inserted as additional rows with grey background at the end of the table.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Not applicable

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

RFMO: ICCAT

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 2.1(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.1.

Deviations from the work plan

List the deviations (if any) in the achieved data collection (lengths only) compared to what was planned. The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.1.

There were no deviations in the achieved data collection for lengths compared to what was planned. All species/stocks that were planned to be sampled for length under a commercial sampling plan were achieved.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Not applicable

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

Text Box 2.2: Planning of sampling for biological variables

Region: Mediterranean and Black Sea

RFMO: GFCM

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 2.1(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

List the deviations (if any) in the achieved collection of biological data (other than lengths), compared to what was planned. The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.2.

According to the sampling plan described in the NWP 2022-24, quota sampling was used to collect data on biological variables (age, weight, sex ratio, maturity). The aim was to collect 5-10 specimens (depending on species) for each size class. Data were taken from the commercial fisheries, through on-board and on-shore sampling in each GSA. Samples were also taken from the MEDITS scientific survey, mainly for the non-marketable fraction of the stocks. The two data sources are complementary.

There were no deviations in the achieved collection of biological data compared to what was planned. All species/stocks for which sampling of biological variables was planned were recorded. In addition, species for which sampling of biological variables was required by GFCM (species of Appendix A.3 of GFCM DCRF, according to Recommendation 10 of RCG MED & BS 2021) were also recorded and are inserted as additional rows with grey background at the end of the table.

Actions to avoid deviations.

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Not applicable

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

RFMO: ICCAT

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 2.1(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

List the deviations (if any) in the achieved collection of biological data (other than lengths), compared to what was planned. The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.2.

There were no deviations in the achieved collection of biological data compared to what was planned. All species/stocks for which sampling of biological variables was planned were recorded.

Actions to avoid deviations.

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Not applicable

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

Text Box 2.3: Diadromous species data collection in freshwater

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 2.1(b) and point 2.3 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used to collect data from freshwater and inland commercial and recreational fisheries for salmon, sea trout and eel. Also include overview of data to be collected from research surveys on salmon, sea trout and eel in freshwater, and on eel in any relevant habitat including coastal waters.

Method selected for collecting data.

Describe briefly the method for collecting the variables presented in Table 2.3. Detailed descriptions are to be included in Annex 1.1. If variables are not directly collected but estimated the method of estimation should be described here.

For the three EMUs, where eel populations exist in Greece (EMU 1, EMU 2 and EMU 3), biological data (length, weight, sex determination and age estimation) on silver eels (*Anguilla anguilla*) populations will be collected. The silver eels' samples are collected from the permanent installed fishing devises in the channel connecting the lagoons with the sea that are operated by Fishing co-operatives. These devices catch all the migrating silver eels, 30% of which are released in order to start their migration, which is an obligation set by the Hellenic Eel Management Plan.

For the period 2022 – 2024 the sampling scheme adapted during the period 2020-21, will be implemented. This methodology is spatially stratified based on the assessment of all EMUs', where eels are present, in a three years period.

For silver eels (descending eels), data on length and weight will be collected on site in different EMU every year (Fisheries dependent sampling). Further samples will be collected for gathering biological variables, such as age and sex.

For the non-commercial part of the population (yellow eels) (Fisheries independent sampling), the abundance of the standing population (yellow and silver eels) will be performed by fyke nets. The data for the yellow eels (number and age classes) will be used to calibrate the Eel Population Dynamics Model (Aschonitis et al. 2015), which in return will provide data on stock (yellow eels and silver eels), recruitment of glass eels in the lagoons and survival rates.

The sampling scheme includes the use of fyke nets placed consecutively (20 sets of fyke nets, 100 m total length). The fyke nets will be placed in random stations in the lagoon and their position will be changed every week (except the migrating period) trying to cover the whole area of the lagoon.

Due to the inability to capture glass eels during the previous years, no father attempts will be performed. All the important variables for glass eels will be obtained with the use of Eel Population Dynamics Model, after its calibration.

REFERENCE

Aschonitis V.G., Castaldelli G., Lanzoni M., Merighi M., Gelli F., Giari L., Rossi R., Fano E.A., 2015. A size-age model based on bootstrapping and Bayesian approaches to assess population dynamics of *Anguilla anguilla* L. in semi-closed lagoons. Ecology of Freshwater Fish, 26: 217–232.

(max 250 words per species and area)

Were the planned numbers achieved? Yes/ No   **YES**
If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

Fisheries Dependent data

Silver eels: according to the Greek National Working Plan 2022-24, the biological data collection and variables estimation for silver eels were designed to be collected from a different EMU every year. The implementation of the WP for 2022 performed in Western Greece (EMU1). The samplings took place during their reproductive migration, 368 silver eels were measured for length. A sub-sample of hundred (100) silver eels were used for the estimation of the other biological parameters (weight, sex ratio, age) and the rest were released.

Fisheries Independent data

Yellow eels: the samplings for yellow eels were performed in the estuarine systems of Agrilos Lagoon and Tholi Lagoon in EMU1, during December 2022. The samplings were carried out using 10 fyke nets in each lagoon, with a total length of 50 m. A total of 188 yellow eels were measured for length. A sub-sample of fifty (50) yellow eels were used for the estimation of the other biological parameters (weight, sex ratio, age) and the rest were released.

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

Region: Mediterranean and Black Sea

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

Greece has the obligation to report data for marine recreational fisheries (MRF) from the relevant GFCM geographical areas. The proposed survey will be conducted during the period 2022-2024 and the aim is to collect data with primary objectives: a) to record the marine recreational fishers practices and activity and b) to collect biological and quantitative data of their catches. The study aims to cover all three types of MRF in Greece namely boat, coast and spearfishing.

The survey is multispecies. Greece has the obligation to report data for eel, elasmobranchs and highly migratory species (ICCAT Convention) included in Table 4 of the EU MAP Delegated Decision annex However, the recreational fisheries of eel, bluefin tuna, albacore, swordfish and a certain number of elasmobranch species is prohibited for recreational fisheries. Data on Table 4 species will be collected through the proposed plan.

The survey is multispecies and therefore it is possible to estimate the total catch of recreational fisheries in terms of species for both caught and released fish. Results from the pilot study indicate that the practice of releasing is not common in Greece, especially for species with high commercial value. The biological parameters that are planned to be collected concern the species caught, the individual total length or weight and as a minimum the total weight of the catch per species. There is no threshold for any stock subject to recreational fisheries in Greece.

The sampling scheme for the period 2022-2024, combines off-site and on-site surveys, since a licensing system for recreational fisheries does not exist in the country.

The off-site survey consists of a tri-annual telephone survey (**GR_REC_OfS**), conducted by a market research and opinion polls agency. The survey's main purposes will mainly be the estimation of the number of MRF in Greece and additionally the recording of their demographic characteristics such as (sex, age, education level etc.), their fishing practices and catch of the most frequent species. As MRF will be considered anyone older than 15 years of age who had been engaged at least once in recreational fishing for the past 12 months prior to the survey. The telephone survey will be conducted during 2022. The survey will also explore the recreational fishermen interest in participating in a more detailed data collection by introducing to recreational fishers the already in place off-site self-reporting tools of a dedicated relevant internet site (https://erasitexniki.inale.gr) and a mobile application. These tools provide potential users with a more modern, easy and immediate tool of self-sampling at sea and on shore, depending on the mode of fishing, in order to record at any time during the day the necessary data and make them instantly available to the researchers. The self-

reporting tools will be continuously promoted to all available contacts, media and press in order to maximize the number of participants. According to their success will be incorporated in the regular sampling in the future.

The on-site survey (**GR_REC_OnS**) will be carried out quarterly. Fisheries Research Institute's (FRI) & Hellenic Center for Marine Research's (HCMR) observers will record biological data on shore, in randomly selected sites in certain geographical areas, in an effort to cover a representative part of the country. Sites will include, piers, ports, beaches and remote sites, to record in situ all fishing modes (boat, coast and spear fishing) and catches (species, length and/or weight) in an effort to collect primary data.

Integration of self-reporting tools with independent monitoring tools (such on-site sampling programs) allows for cross-checking self-reported data and also increases incentives within the recreational fishery community to provide accurate self-reported data. Moreover, upon completion of the pilot study (end 2021), critical qualitative and quantitative data on recreational fishing in Greece will be identified and evaluated providing the necessary input for relevant estimations regarding the recreational fishing activity in the country.

The sampling design as well as the protocols used follow the recommendations of FAO regarding data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021). Moreover, the sampling scheme takes in consideration the recommendations of the latest Regional Co-ordination Group for the Mediterranean and Black Sea (RCG Med & BS 2021).

REFERENCE
Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO. https://doi.org/10.4060/cb5403en.

(max 900 words per region)

Deviations from the work plan

List the deviations (if any) in the achieved data collection, compared to what was planned in the work plan and explain the reasons for the deviations.

Recreational fishery is now part of the regular monitoring. Recreational fishery monitoring for 2022 was carried out taking into account the results and conclusions of the pilot study. The two complementary sampling schemes namely the off-site and on-site surveys remained, as the most appropriate approach for a comprehensive regular monitoring scheme. It applies to all fishing methods recorded and remains multi-species. There were no deviations compared to what was planned in the work plan.

Regarding the off-site survey, a national survey begun in December 2022 and it is going to be concluded in March 2023. The data collected will be analysed and discussed in 2023. In addition, the website dedicated to recreational fishing at https://erasitexniki.inale.gr/, as well as the mobile application (named GRecFish) were introduced and further promoted to the fishers for self-reporting, however the participation is still quite low. Efforts to increase

participation in the self-reporting tools, included informing and engaging recreational fishers during the face-to-face interviews and promoting the self-reporting scheme via the telephone survey. Further actions will be taken towards that direction to try and engage more recreational fishers in the future.

Regarding the on-site survey during 2022, four seasonal sampling trips for on-site monitoring, with the duration of four days in each area, were conducted by trained collaborators using a specially designed protocol/questionnaire for this purpose. The protocol remains the same as the one used during the Pilot Study and it records details of fishing method, species caught and released, biological data and expenses.

Scheduled seasonal on-site sampling trips at certain regions (Thracian Sea, Ionian Sea, Saronikos Gulf) were conducted as planned during the year.

A technical document titled 'Methodology and Data Quality Assurance Framework for Recreational Fishing' is now publicly available describing the methodologies used for handling recreational fisheries data under the Greek DCF in: **https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf**

Action to avoid deviations

Describe the actions that will be considered/have been taken to avoid the deviations in the future and when these actions are expected to produce results.

There were no deviations

(max 900 words per region)

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) of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

This text box is complementary to information on the sampling schemes provided in the quality document (Annex 1.1). It serves to highlight additional information on sampling schemes and sampling frames that the Member State considers useful to understand the sampling design planned for the region and the implementation year(s).

Additional information on sampling schemes

You may add specific contextual information related to a region and the implementation year(s), for instance highlighting new developments not yet detailed in the quality document, regional adaptation and/or perspectives for the future. Insert the information under the same sampling scheme identifier as in Table 2.5.

SeaComTripallsp - ShoreComTripallsp
For Bottom otter trawls, purse seines and beach and boat seine the 100 % of the trips are conducted on board (SciObsAtSea). For the small-scale fishery métiers, the 70% of the trips are conducted on board (with the sampling scheme SciObsAtSea) and 30% of the total number of sampling trips are conducted on shore (with the sampling scheme SciObsOnShore). In any case, to facilitate species identification, when necessary, molecular techniques (DNA barcoding) are applied to identify species quickly and accurately, corroborating morphological identification of field-collected individuals.

SeaComTripallsp
For SciObsAtSea sampling scheme, all hauls are selected (no stratification), and within each haul, samples are taken from all catch fractions (landings, discards, unwanted catches). **A** random sample of 50-100 individuals are recorded for lengths, along with Total Weight and Sample Weight per catch fraction. Regarding discards, whenever the total volume is very high, which is common in bottom otter trawls, at least the 10% of the volume in each haul is used for sampling.

For the sampling of biological variables, the selected species are listed in table 2.2 of Greek WP. The stratification of stocks in Groups (Group 1,2,3) and the frequency of sampling for length and other biological variables proposed by GFCM-DCRF has been adopted following recommendation 10 of RCG Med& BS 2021. A sample from the catch fraction of each target species (the species included in Table 2.2 of Greek WP), is selected randomly during on board sampling and transferred to laboratory to obtain all the necessary biological information.

ShoreComTripallsp
For SciObsOnShore sampling scheme, only the landings are recorded from all hauls combined. All the individuals per species are recorded and whenever the number of individuals is high, a random sample of 50-100 individuals is recorded for lengths, along with Total Weight and Sample Weight.

Additional description of sampling frames

You may add a complementary description to what includes the 'Sampling frame description' column of Table 2.5. Insert the information under the same identifier and name as in the columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

NA

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

Sampling scheme name (or identifier): SciObsAtSea (identifier SeaComTripallsp)

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

In most cases, the deviations were related to the delay in the start of the project in 2022. Due to this, sampling intensity was affected in certain sampling frames/metiers, but to varying degrees.

- OTB_DEF

Sampling intensity in the trawl fishery was the most affected because, in addition to the late project start, there is a closed season for the trawl fishery from 23 May to 1 October. Consequently, sampling was limited to almost five months.

- LLS_DEF, GNS _DEF, GTR_DEF

Sampling intensity in some sampling frames/metiers of the small-scale fishery, namely: GNS _DEF and GTR_DEF in GSA 22 and LLS_DEF, GNS _DEF and GTR_DEF in GSA 20, was also affected but to a lesser extent, as the achievement was > 70% for all of them. The reduction in fishing effort in the net fishery in GSAs 20 and 22 also had a negative impact on implementation.

- LLD_LPF

For drifting longlines, most vessels undertake multi-day trips and due to their size (< 12m) are reluctant to accept observers on board because of lack of space and for safety reasons. Therefore, sampling intensity was low. More on-shore trips were made to compensate.

- SB-SV_DEF

For boat seines no sampling trip was realised during 2022 as the relevant fishery did not operate due to administrative issues.

It should be mentioned that in Greece very few vessels (if any) use PETS mitigation device. Therefore, no trip was sampled with PETS mitigation device.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

During 2023 the project has started without delay, so we expect the planed trips to be achieved.

Regarding LLD_LPF, we have had the time to make all the necessary arrangement with vessels >12m in order to accept observers on board and with vessels <12m that undertake one-day fishing trips, so we expect better coverage in 2023.

Regarding SB-SV_DEF_0_0_0 the sampling will be adjusted according to any future change of the decision on the operation of the gear.

Sampling scheme name (or identifier): SciObsOnShore (identifier SeaComTripallsp)

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The delayed start of the project affected the planned sampling also in the onshore sampling.

- LLS_DEF, GNS _DEF, GTR_DEF

Sampling intensity in certain sampling frames/metiers of the small-scale fisheries, namely: GTR_DEF in GSA 23, GTR_DEF and LLS_DEF in GSA 22, and LLS_DEF, GNS _DEF, GTR_DEF in GSA 20, was affected by the late start of the project, yet achievement was > 70% for most of them. The reduction in fishing effort in the net fisheries in GSA 20 and 22 also had a negative impact on implementation.

- LLD_LPF

For drifting longlines more trips were made on-shore to compensate for the lower intensity of on-board sampling and to maximise coverage of biological variables for key species.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

During 2023 the project has started without delay, so we expect the planed trips to be achieved.

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

Text Box 2.6: Research surveys at sea

Region: Mediterranean and Black Sea

(Research survey: MEDITS)

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey: **International Bottom Trawl Survey in the Mediterranean - MEDITS**

1. Objectives of the survey
For mandatory surveys: list the full list of target species/ecosystem components set by the coordinating group (as opposed to the target species provided in Table 1 of the EU MAP Implementing Decision) and the international, and additional national objectives.
For non-mandatory surveys: describe the purpose of the survey including sampling activities and target species/ecosystem components, the end user and how the data are used.

The primary goal of the MEDITS survey is to evaluate stocks' abundance, biomass and distribution and to monitor changes on them, to describe the demographic structure of the demersal megafauna community and to collect biological data of certain species, as well as abiotic parameters. In addition, voluntary collection of data on Marine Litters, in agreements with the requirements of the Marine Strategy Directive Framework (Directive 2008/56/EC) takes place, as well as stomach samples from the species *Merluccius merluccius* for stomach contents analysis.

The full lists of target species and ecosystem components are described in
http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf.

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.
Indicate the time period for the survey (same as in Table 2.6). If documentation of the survey design and methods used is available online in English, you can refer to that documentation.

The MEDITS survey is carried out annually in three GSAs: Aegean Sea (GSA 22), Ionian Sea (GSA 20) and Cretan Sea (GSA 23) from June to September. Sampling is based on depth stratified scheme including 184 sampling stations (hauls) distributed in five depth zones (referred also as depth strata): 10-50 m, 50-100 m, 100-200 m, 200-500 m, and 500-800 m. A bottom trawl made of four panels is used, designed by IFREMER (reference GOC73) for experimental fishing. The doors (Otter Boards) are of type MorgereWH S and sensors to control the trawl geometry (vertical and horizontal openings, contact with the bottom) are also positioned on the net.
Standard formats are defined for the storage and to facilitate the exchange of the data produced by the MEDITS surveys. Five file types are defined in order to store and exchange

the data: TA (haul characteristics), TB (catch by haul), TC (biological parameters at aggregated level), TE (biological parameters at individual level), TL (litter categories)
More details about the survey design and the methods used are described by detail in the MEDITS manual:

http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf
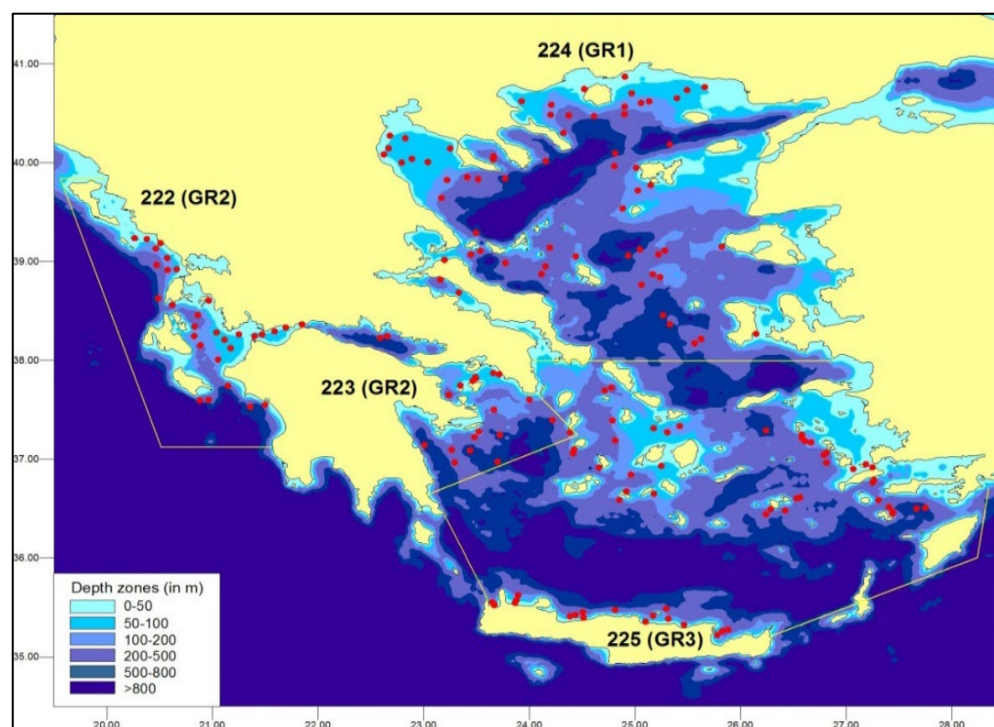
Fig. 2.6.1 Map of the sampling areas and sampling stations in the GSAs 20,22,23. Red spots represent the sampling stations.

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

MEDITS Steering Committee is in charge of planning the Survey.
Participating EU member states are Greece, Spain, Italy, France, Cyprus, Croatia, Slovenia and Malta. Details for the vessels used for the surveys by member state are described in the MEDITS manual. Each MS is responsible for the activities conducted on its national part of the international survey. There is no cost sharing agreement for this survey.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.
For Type of participation other than 'Financial' describe the type of participation, and/or the background of the type of participation in more detail.

NA
(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

MEDITS data are commonly used for demersal species stock assessments (GFCM, STECF stock assessment groups) and also for indicators estimations used for the evaluation of demersal megafauna communities and of the marine environment. Additionally, the data contribute to the estimation of descriptive indicators mandatory for the Marine Strategy Framework Directive (MSFD) and in numerous European Research Projects, McS, PhDs and scientific publications in national and international level.

7. Extended comments
Extended AR comments can be placed under this section.

All the planned sampling activities (186 hauls) were achieved within the official survey areas (GSAs 20,22,23). With regard to the temporal coverage 160 out of 186 hauls (86%) were carried out in June-July 2022 (work plan: June-September). On July 14, 2022 one of the three chartered bottom trawlers (the one in N. Aegean, GSA 22) experienced engine failure during survey and the engine had to be replaced. The rest of the hauls (26) were realized in the first fortnight of October 2022.

(max. 450 words per survey)

(Research survey: MEDIAS)

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey: **MEDIAS**

1. Objectives of the survey
For mandatory surveys: list the full list of target species/ecosystem components set by the coordinating group (as opposed to the target species provided in Table 1 of the EU MAP Implementing Decision) and the international, and additional national objectives.
For non-mandatory surveys: describe the purpose of the survey including sampling activities and target species/ecosystem components, the end user and how the data are used.

The objectives of the MEDIAS carried out in the Greek part of GSAs 22 during May and June and 20 during September and October are:

- Assess total pelagic fish echo abundance per EDSU.

- Assess Abundance and Biomass indices estimation of the target species anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) in the surveyed area by means of acoustics.
- Collect biological information for the population of the target species in the surveyed area by means of midwater trawl hauls.
- Estimate Age and length structure of the population of the target species.
- Collect biological information for all pelagic species represented in the catch composition of the midwater trawl hauls (i.e., Length frequency distribution and Length – Weight relationships).
- Collect environmental information based on CTD sampling in predefined sampling stations

Assess ecosystem indicators derived from acoustic surveys as described in the MEDIAS handbook (2021) upon request.

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.
Indicate the time period for the survey (same as in Table 2.6). If documentation of the survey design and methods used is available online in English, you can refer to that documentation.
The methodology applied in the Pan-Mediterranean International Acoustic Survey (MEDIAS) carried out in the Greek part of GSAs 22 and 20 is the one described in the MEDIAS manual (see MEDIAS Handbook 2021, http://www.medias-project.eu/medias/website/handbooks-menu/handbooks/MEDIAS-Handbook-(April-2021)/).

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

The Mediterranean International Acoustic Survey (MEDIAS) in Greek waters (GSAs 22 and 20) is carried out with the R/V PHILIA owened by the Hellenic Centre for Marine Research. The Institute of Marine Resources and Inland Waters of the Hellenic Centre for Marine Research is the body that carries out MEDIAS in Greek waters. The MEDIAS steering committee is the relevant international group in charge of planning the survey.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.
For Type of participation other than 'Financial' describe the type of participation, and/or the background of the type of participation in more detail.

NA

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The survey is part of the MEDIAS Coordination Group, reports can be found at http://www.medias-project.eu/medias/website/meetingrep.html

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context. *If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.*

The survey results (i.e., abundance estimates, biomass index) are routinely used in the GFCM Stock Assessment Working for Small Pelagics (WGSASP) as tuning index for the stock assessment of anchovy and sardine stocks in GSA20 and GSA22. In national context they are used for estimates the fleet report. Moreover, in the national context input is provided also for the MSFD descriptors D3 and D4.

7. Extended comments
Extended AR comments can be placed under this section.

The reduced number of days at sea in 2022 survey did not affect the survey performance. The higher number of days at sea that were initially foreseen aimed to anticipate bad weather and poor biological sampling.

The size and the geographic distribution of anchovy (Engraulis encrasicolus) and sardine (Sardina pilchardus) stocks in Northern Aegean Sea (GSA22) and eastern Ionian Sea (GSA 20) were estimated with the acoustic methodology. The methodology of the acoustic survey follows the protocol of MEDIAS so that results are harmonized and comparable to the other Mediterranean areas.

In GSA22, acoustic echoes were registered continuously along 60 pre-defined transects in the northern Aegean Sea during June-July 2022 (Fig. 1 in Appendix MEDIAS maps) with a Simrad ES38-7, 38 kHz split-beam echo sounder transducer. Acoustic survey covered a total area of 27835 Km2 in the northern Aegean Sea. In order to estimate anchovy's and sardine's biomass, the weight-length relationship is required as well as species length frequency distribution per area. Therefore, 29 pelagic trawls were held along transects in the positions of high fish concentrations.

Hydrographic parameters were recorded over a grid of 129 sampling stations in northern Aegean Sea (Fig 2 in Appendix MEDIAS maps). At each station of the sampling grid vertical profiles of temperature and salinity were obtained by a Temperature-Salinity-Depth (CTD) system SBE-19 of Seabird Electronics. Plankton sampling took place at a grid of 173 sampling stations in northern Aegean Sea (Fig 2 in Appendix MEDIAS maps).

In GSA20, acoustic echoes were registered continuously along 46 pre-defined transects in the eastern Ionian Sea during September 2022 (Fig. 9 in Appendix MEDIAS maps) with a Simrad ES38-7, 38 kHz split-beam echo sounder transducer. Acoustic survey covered a total area of 10525 Km2 in eastern Ionian Sea. In order to estimate anchovy's and sardine's biomass, the weight-length relationship is required as well as species length frequency distribution per area. Therefore, 21 pelagic trawls were held along transects in the positions of high fish concentrations.

Hydrographic parameters were recorded over a grid of 80 sampling stations in eastern Ionian Sea (Fig 2 in Appendix MEDIAS maps). At each station of the sampling grid vertical profiles of temperature and salinity were obtained by a Temperature-Salinity-Depth (CTD) system SBE-19 of Seabird Electronics. Plankton sampling took place at a grid of 80 sampling stations in eastern Ionian Sea (Fig 9 in Appendix MEDIAS maps).

See file "Appendix MEDIAS maps" for resulted maps.

28

(max. 450 words per survey)

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

Explain the reasons for implementing complementary data collection.

In the case of Greece, control regulation is not applied to all fishing vessels. More specifically, vessel with length less than 10 metres are not obliged to report Data on Electronic Report System (ERS)* and/or to install a satellite-based Vessel Monitoring System (VMS) device (e.g., fishing vessels less than 6 meters, without a special licence). Therefore, for the fleet segments that include those vessels, the estimation of effort and landings is done via a complementary data collection (probability random sampling), using face to face interviews with structured questionnaires and data from biological sampling, as also proposed by MARE/2014/19.

In addition, for specific variables and fleet segments, the control regulation data is going to be validated through the sample survey. The validation process is considered as necessary as the obligational reporting of data on ERS for a part of the fleet is recent and fishers are not yet familiar with it. Therefore, potential errors and non-responses that may significantly affect control data may occur. The validation process refers to variables Weight of landings, Days at sea, Number of trips, Value of landings per species, Average price per species and to the following segments: Demersal trawlers and/or demersal seiners 18-24m and 24-40m; Purse seiners 12-18m, 18-24m and 24-40m; Vessels using hooks 12-18m; Vessels using drift and/or fixed netters 12-18m.

Complementary survey is also necessary to identify inactive vessels in the length classes 0-6m and 6-12m, and to estimate the corresponding capacity variables**. As control regulation is yet not applied to all fishing vessels, the capacity variables for the segments: "Inactive vessels 0-6m" and "Inactive vessels 6-12m" are estimated through the sample survey. The first step is the identification of inactive vessels in the sample of each stratum with length class 0-6m or 6-12m (for more details on the stratum used, see Annex 2.1). Then, the inactivity level of each stratum is used to estimate the capacity variables of the inactive part of its population (assuming that the distribution of the capacity variables is equal for both active and inactive vessels in each stratum) and to adjust the capacity variables for the active part of the population. This is done for each of the relevant strata and then the aggregation of all relevant strata (or the weighted average in the case of "average age" and "average length") are used to estimate the capacity variables for the segments "Inactive vessels 0-6m" and "inactive vessels 6-12m".

 * ERS data are coming from the Integrated Monitoring System of Fisheries Activities (OSPA) of the Ministry of Rural Development and Food.

** in the case of the segments "Inactive vessels 12-18m", "Inactive vessels 18-24m" and "Inactive vessels 24-40m", vessels that are included in the Fleet Registry and report ERS data can be considered as active, while the rest that have no records in ERS can be considered as inactive.

Information on the sampling schemes is available in the quality document (Annex 1.2). However, the Member State is invited to highlight additional information here on sampling schemes and sampling frames deemed necessary to understand the actual sampling design planned for the implementation year(s).

The planning design is adequately described in Annex 2.1 as well as in the methodology report document of AGRERI, available at: https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf .

(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

As Table 3.1. demonstrates, there is one deviation related to the clustering of "dredges 0-6 (DRH)" with "dredges 6-12 (DRH)", which is based on the fact that there are less than 10 vessels in the former segment (based on the suggested clustering procedure, see also point 1 of TextBox 5.2). Another deviation refers to the cease of boat seines ("Demersal trawlers and/or demersal seiners 6-< 12 m*" and "Demersal trawlers and/or demersal seiners 12-< 18 m*"). The operation of boat seines during 2021 was suspended by ministerial decision (145/296596/2020). The vessels included in this category have been allocated to different fishing segments based on their updated primal fishing gear (if any).
Finally, there are some low-response segments. In the case of "Dredges 6-12* (DRH)", low response rates in those cases are explained in the comments column in Table 3.1. The rest cases, refer to Large-Scale Fisheries segments where fishers where reluctant to participate in the survey, as they already report their effort and landings in the ERS system.

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Regarding clustering and beach seines, this is not an unwanted deviation that could be avoided.

Regarding the large scale fisheries segment, MS will try to eliminate low response rates in the next years, by better explain to the fishers the purpose of the survey, why it is useful and how it can benefit the whole sector.

(max. 900 words)

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.

Describe data collection of inland eel commercial fisheries landings, effort and capacity. List or describe, for instance, the number of fishing entities, fishing methods, and the associated units used.

Eel fisheries in Greece is allowed only for commercial purposes in the lagoons, where the fisheries are allowed to be performed only by fishing cooperatives; as well as in some rivers after issuing a special fishing permit by the General Fishery Department. The permitted fishing season corresponds to the period of the spawning migration of the species (December 1st of each year until March 31st of the following year).

In lagoons, fishing effort is estimated by the total number of fishing days which is equivalent to the period of the fisheries allowance. The estimation of the fishing effort for inland waters (rivers) corresponds to fishing days declared by the fishermen, who have the special fishing permit.

At the end of each year, the General Fisheries Department, Ministry of Rural Development and Food, provide all the above data (landings, fishing effort) to be used to fulfil countries obligations derived by the requirements of EU-MAP.

(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

There were no deviations

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

NA
(max. 900 words)

Text Box 4.2: Incidental catches of sensitive species

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.

This text box is complementary to information on the sampling schemes provided in the quality document (Annex 1.1). It serves to highlight information on sampling schemes and sampling frames related to incidental catches of sensitive species.

Incidental bycatch of sensitive (Protected, Endangered and Threatened – PET – species) will be recorded through the SciObsAtSea sampling scheme (see Annex 1.1, Sampling scheme identifier: SeaComTripallsp).

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?
An assessment of the relative risk of bycatch for the different gear types/metiers was not realised yet. According to Recommendation 4 of RCG Med&BS 2021, a joint workshop of RCG Med&BS and STREAMLINE on data needed to assess the impact of fisheries on the marine ecosystem will be realised in 2022 and one of the follow up actions is to identify high risk metiers by group of species for by-catch monitoring, taking into account the results of pilot studies.

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

Based on the outcomes of the tri-annual pilot study on the level of fishing and impact of fisheries on biological resources and marine ecosystem, conducted by Greece from 2018-2020, in GSAs 20, 22 and 23, the selected metiers for which PET data will be recorded are the bottom otter trawls targeting demersal species (OTB_DEF_>=40_0_0), set gillnets for demersal fish (GNS_DEF_>=16_0_0), set trammel nets for demersal fish (GTR_DEF_>=16_0_0), set long lines for demersal fish (LLS_DEF_0_0_0) and drifting long lines for large pelagic fish (LLD_LPF_0_0_0).

- What are the methods to calculate the observation effort?

The PSU is the fishing trip. The on-board observers are instructed to check throughout the whole fishing operation for incidental by-catch of PET species on the recorded fishing trips. As a result, the observation effort is calculated as the ratio between observed trips to total trips (total effort) per métier and GSA

- 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.
The sampling design as well as the protocols used follow the recommendations of Regional Co-ordination Group for the Mediterranean and Black Sea (RCG Med&BS 2021), FAO (2019), the Joint WGBYC-WGCATCH Workshop on sampling of bycatch and PET species (WKPETSAMP, ICES 2019) as well as on the Working Group on Bycatch of Protected

Species (WGBYC, ICES 2020). The sampling will be carried out by the two partners, FRI and HCMR, in their areas of responsibility.

REFERENCES

FAO. 2019. Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 640. Rome, FAO.

ICES. 2020. Working Group on Bycatch of Protected Species (WGBYC).

ICES. 2019. Joint WGBYC-WGCATCH Workshop on sampling of bycatch and PET species (WKPETSAMP), 24–26 April 2018, SLU Aqua, Lysekil, Sweden, ICES CM 2018/EOSG:35. 76 pp.

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?

— 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?

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

The on-board observer protocol contains a check for rare specimens in the catch at the opening of the cod-end. The observers are instructed to indicate if the cod-end was not checked in a haul. In gill nets - and hook-and-line fisheries, 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. In large catches, the protocol instructs to check for rare specimens during sorting of the catch. If not, the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level".

Additionally, to ensure data quality, observers are instructed to take photos of the haul at the opening of the cod-end before the shorting process begins, as well as photos of the specimens of rare species caught.

Additional information on sampling schemes:

You may add specific contextual information related to a region and the implementation year(s), for instance highlighting new developments not yet detailed in the quality document, regional adaptation and/or perspectives for the future. Insert the information under the same sampling scheme identifier as in Table 2.5.

NA

Additional description on sampling frames

You may add a complementary description to what includes the 'Sampling frame description' column of Table 2.5. Insert the information under the same identifier and name as in the columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

NA

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

Results

Provide additional information, if available, in this text box. For example, summary information on the number of individuals recorded as bycaught per species, gear group and monitoring method with information about the state of the animals (i.e. were they released alive, dead, or collected for sampling).

In 2022, Greece recorded the incidental by-catch of Protected Endangered and Threatened (PET) species by on-board observers. in bottom trawlers, longlines and static nets (trammel nets, gillnets). The number of on-board trips recorded for 2022 pre gear and GSA were:

GSA	GNS	GTR	LLS	OTB
GSA 20	43	129	43	20
GSA 22	254	295	149	159
GSA 23	8	23	19	5

In GSAs 20, 22 and 23 one mammal (*Monachus monachus*), two birds (*Phalacrocorax aristotelis* and *P. carbo*) incidental by-catch was recorded in the entire sample. Five incidents of bycaught Sea turtle (*Carreta carreta*) in GSA22 were recorded. The number of PET species specimens found in the three GSAs (regardless of whether the length was recorded or not) were:

GSA	Species	GNS	GTR	LLS	OTB
GSA 20	*Aetomylaeus bovinus*	0	1	0	2
GSA 20	*Alosa fallax*	5	1	0	47
GSA 20	*Dasyatis pastinaca*	0	9	0	0
GSA 20	*Epinephelus marginatus*	0	1	18	0
GSA 20	*Mustelus mustelus*	5	7	0	10
GSA 20	*Raja asterias*	1	0	80	73
GSA 20	*Raja clavata*	5	0	0	58
GSA 20	*Sciaena umbra*	2	79	3	9
GSA 20	*Squalus blainville*	0	0	4	8
GSA 22	*Aetomylaeus bovinus*	0	9	0	5
GSA 22	*Alosa fallax*	2	11	0	74
GSA 22	*Caretta caretta*	0	0	0	5
GSA 22	*Chimaera monstrosa*	0	0	0	58
GSA 22	*Dalatias licha*	0	0	0	2
GSA 22	*Dasyatis pastinaca*	2	67	7	26
GSA 22	*Dasyatis tortonesei*	0	0	1	10
GSA 22	*Dipturus oxyrinchus*	0	0	0	97
GSA 22	*Epinephelus marginatus*	1	2	15	0
GSA 22	*Galeorhinus galeus*	0	1	0	0
GSA 22	*Gymnura altavela*	0	1	1	4
GSA 22	*Hexanchus griseus*	0	0	0	1
GSA 22	*Hippocampus guttulatus*	0	1	0	0
GSA 22	*Hippocampus hippocampus*	0	3	0	0

GSA 22	*Leucoraja naevus*	0	1	0	44
GSA 22	*Monachus monachus*	0	0	1	0
GSA 22	*Mustelus mustelus*	3	26	26	39
GSA 22	*Mustelus punctulatus*	0	0	5	17
GSA 22	*Myliobatis aquila*	1	37	2	3
GSA 22	*Oxynotus centrina*	0	0	0	2
GSA 22	*Phalacrocorax aristotelis*	0	1	0	0
GSA 22	*Phalacrocorax carbo*	0	0	1	0
GSA 22	*Prionace glauca*	0	0	0	1
GSA 22	*Raja asterias*	0	0	0	77
GSA 22	*Raja brachyura*	0	0	0	1
GSA 22	*Raja clavata*	23	29	47	762
GSA 22	*Raja radula*	0	460	18	67
GSA 22	*Rostroraja alba*	0	0	0	1
GSA 22	*Sciaena umbra*	19	109	14	0
GSA 22	*Squalus acanthias*	1	0	0	208
GSA 22	*Squalus blainville*	50	0	105	259
GSA 22	*Umbrina cirrosa*	26	38	10	0
GSA 23	*Dasyatis pastinaca*	5	11	14	2
GSA 23	*Dipturus oxyrinchus*	0	0	0	4
GSA 23	*Epinephelus marginatus*	0	6	25	0
GSA 23	*Leucoraja naevus*	0	2	0	0
GSA 23	*Myliobatis aquila*	0	1	0	0
GSA 23	*Raja clavata*	0	0	24	82
GSA 23	*Sciaena umbra*	2	3	0	0
GSA 23	*Squalus blainville*	0	0	0	25
GSA 23	*Umbrina cirrosa*	0	1	0	0

Species *Caretta caretta, Galeorhinus galeus, Gymnura altavela, Hexanchus griseus, Hippocampus hippocampus, Monachus monachus, Oxynotus centrina Rostroraja alba in GSA 22* were released alive.

Deviations from the work plan

The Member State shall list the deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

There were no deviations from the work plan.

Actions to avoid deviations

The Member State shall describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Not Applicable

(One text box of 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.

1. Aim of the study

In order to evaluate, distribute and extend the impact to seabed from trawling, Vessel Monitoring System (VMS) data will be analysed. The VMS provides accurate detailed information on the position, direction and speed of commercial fishing vessels at regular intervals. Therefore, the fishing effort and intensity of bottom fishing can be assessed reliably in space and time.

2. Duration of the study

2022-2024

3. Methodology and expected outcomes of the study

The primary stage of the analysis of VMS data includes: a) the quality control of the data to eliminate common errors, b) the identification of intermediate signals using interpolation techniques d) the identification of vessel positions as "fishing", "steaming" or "mooring" based on the speed thresholds and fisheries legislation.

The next step of the analysis concerns the estimation of spatio-temporal indicators to estimate the intensity of impact at the seabed by trawling. Specifically, the ratio of the total swept area divided by the spatial cell surface (indicator: Swept Area Ratio) is estimated. Estimates will be made on predefined grids (e.g. 0.05 * 0.05 dd and 0.01 * 0.01 dd) , while estimates can be performed at various space-time scales.

In a later stage, the spatio-temporal results raised from the intensity of seabed impact from trawling can be combined with the type of substrate and the estimated sensitivity of habitat types to disturbance. During the period 2022-2023, substrate-habitat type data will be collected from bibliography, EMODNET and onboard sampling. The last year of the current study (2024), the collected data will be analyzed and modeled.

Concerning the impact of fisheries on seabed from other fishing techniques (static nets, bottom longlines), relevant data sets, habitat mapping and improvement of analysis techniques are required in order to optimally estimate the effects. The study will be carried out by the two partners, FRI and HCMR, in their areas of responsibility. In the current study, a specific effort will be spent to collect as much as possible information from SSF (static nets and bottom longlines) for the impact of fisheries on seabed. If the data is considered relevant and sufficient of supporting the analysis and modelling, this will be done in the next period (2025-2027).

(max 900 words per study)

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

Name of the study: FishImpBenHab

Fishing intensity was estimated using Vessel Monitoring System (VMS) data. All Greek bottom trawlers are equipped with VMS according to Commission Regulation (EC, 1224/2009). For the current work, primary VMS data for the years 2010-2020 were provided by the Ministry of Maritime Affairs & Insular Policy and were analyzed based on the methods and specifications further described in Kavadas et al. (2014) and Maina et al. (2016) followed by the estimation of Swept Area Ratio (SAR), an index that is used for describing fishing intensity.

The primary analysis of the VMS data included:

- quality control of the data to eliminate common errors and outliers,
- the estimation of intermediate signals using spatial interpolation methods,
- the classification of vessel positions as 'fishing', 'steaming' and 'mooring' based on speed thresholds and the incorporation of fisheries legislation to accurately delineate fishing grounds.

Subsequently, the swept area is estimated i.e. the cumulative area contacted by a fishing gear within a grid cell (Eigaard et al., 2017). Then, the SAR is also calculated i.e. the swept area divided by the surface area of the grid cell. The SAR values indicate the theoretical number of times the entire grid cell area would have been swept if effort were evenly distributed within each cell. Estimates of SAR within each grid cell were calculated annually in a regular grid of 0.05×0.05 and in 0.01×0.01 decimal degrees.

Annual SAR estimations can be also spatiotemporally assigned to each habitat type, for performing comparisons. Substrate-habitat type data are mainly based on EMODNET and we are exploring further sources to supplement these datasets from bibliography, and onboard sampling.

Results revealed that the higher the SAR value, the more times the fishing gear has been in contact with the bottom in a specific spatial cell. This analysis was done at the level of grid cell, but also for the different habitat types. The results showed that the highest values of the SAR index are present in the regions of the North Aegean, the North Euvoikos gulf, the Saronikos gulf, in a part of the gulf of Patras, near the islands of the East Aegean (e.g., Lesvos, Samos, Kos) and in areas of Crete. Also, no significant differences are observed between the annual outcomes of the SAR index for the period 2010-2020. For the latter years the average of SAR values is 0.4.

The outcomes also contribute for the purposes of Marine Strategy Framework Directive (MSFD), Descriptor 6 Criterion 2.   No deviations are currently occurred.

Achievement of the original expected outcomes and justification if this was not the case.

The current period the main goals to analyze VMS data from bottom trawlers and estimate SAR were achieved.

Follow-up to the activities (what are the next steps, how the results will be used).
Exploring ways of estimating fishing intensity for Small Scale Fisheries.
Given that methods to estimate the fishing intensity from SSF are not yet standardized, we will focus on exploring the datasets and follow specific groups (e.g. ICES) working to develop methodologies that could be adopted for the needs of the case study.

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Kavadas, S., Carmen, B., Andrea, B., Piera, C., Stefano, C., C Camilla, C., Lorenzo, D-A., Dokos, J., Maina, I., Martinelli, M., Massutí , E., Moranta, J., Parisi , A., Quetglas, A., Russo, T., Santojanni, A., Vasilopoulou V., 2014. Common methodological procedures for analysis of VMS data, including web-based GIS applications related to the spatial extent and intensity of fishing effort. PERSEUS Project. ISBN no: 978-960-9798-14-3
Maina, I., Kavadas, S., Katsanevakis, S., Somarakis, S., Tserpes, G., Georgakarakos, S., 2016. A methodological approach to identify fishing grounds: A case study on Greek trawlers. Fish. Res. 183, 326–339. https://doi.org/10.1016/j.fishres.2016.06.021

(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

In cases where a fleet segment has less than 10 vessels:
   (a) *Clustering may be necessary in order to design the sampling plan and to report economic variables;*
   (b) *Member States shall report which fleet segments have been grouped at the national level and shall justify the clustering on the basis of statistical analysis;*
   (c) *In their annual report, Member States shall report the number of sampled vessels for each fleet segment regardless of any clustering made to collect or provide the data."*

Clustering should be described, and information should be given on the segments that are clustered.
The Member State should distinguish between segments considered for clustering as follows:
   (a) *Important segments with distinct characteristics;*
   (b) *Segments similar to other segments;*
   (c) *Non-important segments with distinct characteristics.*

Importance of fleet segments should be assessed in terms of landings (value and volume) and/or effort. Similarity should be demonstrated using expert knowledge on fishing patterns or on available data on landings and/or effort.

For each of the cases described, the Member State should apply the following approaches for clustering according to the different characteristics of fleet segments:
   (a) *Important segments with distinct characteristics*
   (b) *Such segments should not be clustered unless strictly necessary in data reporting for confidentiality reasons. Data should be separately collected for these segments and included in national totals (unless separate identification is then made possible as a consequence).*
   (c) *Segments similar to other segments*
   (d) *Such segments can be clustered for sampling purposes, as well as for confidentiality reasons. The segments merged should be selected according to criteria that should be fully explained and justified by the Member State. In particular, the approach to determine similarity should be clearly described by the Member State.*
   (e) *Non-important segments with distinct characteristics*
   (f) *Such segments can be clustered for sampling purposes, as well as for confidentiality reasons. These segments can be merged with other non-important segments. Clustering of these segments with other important segments should be avoided. The Member State should explain how the lower importance had been determined and for which reasons the clustered segments have been selected. Clusters should be named after the biggest segment in terms of number of vessels or economic significance.*

Table 5.2.1 and Figure 5.2.1 show the fleet segments with less than ten vessels that are merged with other segments to design the sampling plan and to report economic variables, following the guidelines of STECF (2009). In all cases, the segments merged are very similar to the clustered segments (the case of "*segments similar to other segments*"), as they include the same métiers and only differ in the length class. Moreover, clustering does not affect the aggregated segment, since the number of vessels of the merged segments is very small

compared to the number of vessels of the clustered segments (see the last column of Table 5.2.1).

Table 5.2.1: The clustering scheme of Greek fleet segments (based on the Fleet Registry retrieved from EU on September 29th 2021).

	Merged segment		Clustered segment		No of vessels after clustering
	Length Class	No. of Vessels	Length Class	No. of Vessels	
DFN	VL1824	2	VL1218	177	179 (98.9% DFNVL1218)
DTS	VL0006	3	VL0612	174	177 (98.3% DTS0612)
FPO	VL1218 VL1824	9 1	VL0612	269	279 (96.4% FPOVL0612)
HOK	VL1824	8	VL1218	121	129 (93.8% HOKVL1218)
PS	VL0612	2	VL1218	81	83 (97.6% PSVL1218)

MERGED SEGMENTS   **CLUSTERED SEGMENTS**

DFN VL1824 — 2+177 → DFN VL1218 =179

DTS VL0006 — 3+174 → DTS VL0612 =177

FPO VL1218 FPO VL1824 — 9+1+269 → DFN VL1218 =279

HOK VL1824 — 8+121 → HOK VL1218 =129

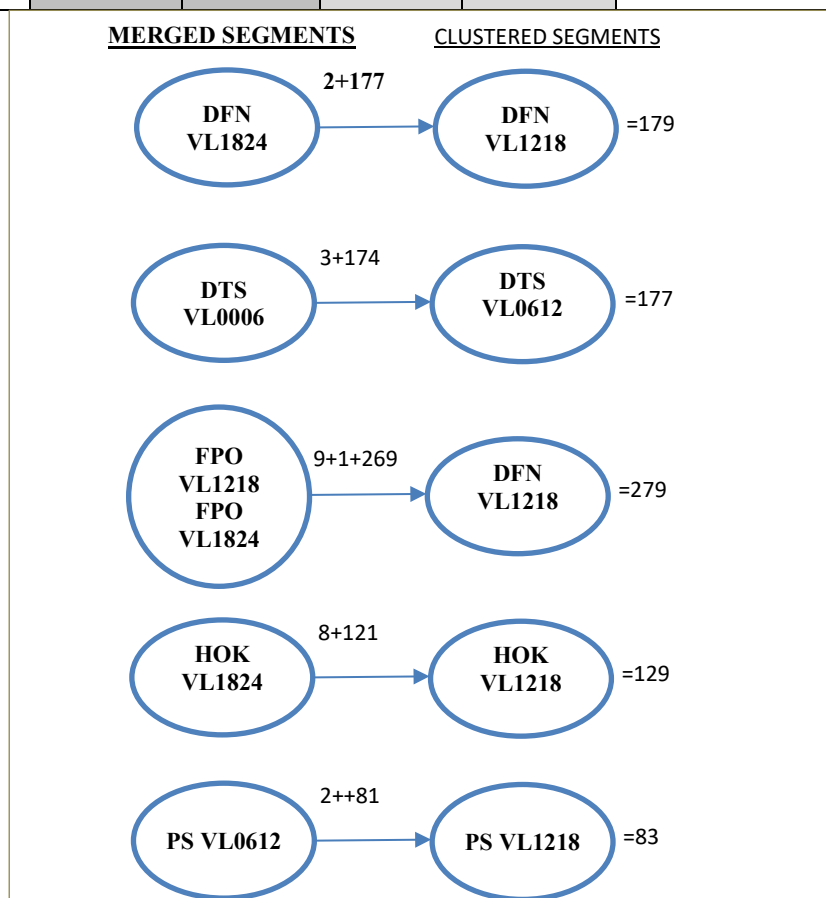PS VL0612 — 2++81 → PS VL1218 =83

Figure 5.2.1: The process of clustering and the corresponding number of vessels per cluster.

This text is retrieved from the section 2 of the Methodology Report for Fleet Socio Economic Variables National Fisheries Data Collection Program, v.4, available at: https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf

2. Description of activity indicator

If the Member State is using an activity indicator to divide the fleet segment into different activity levels, use 'L' for the low activity vessels and 'A' for the normal economic activity vessels. Please provide a description of the activity methodology used.

Not Applicable

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

Describe and justify any deviations from variable definitions as listed in the 'EU MAP Guidance Document' on the DCF website.
In case the PIM is not used, explain and justify the application of alternative methods.

No deviations exist
(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

As Table 5.2. demonstrates, there is one deviation related to the clustering of "dredges 0-6" (DRH) with "dredges 6-12"(DRH), which is based on the fact that there are less than 10 vessels in the former segment *(*based on the suggested clustering procedure*)*.
Another deviation refers to the cease of boat seines ("Demersal trawlers and/or demersal seiners 6-< 12 m*" and "Demersal trawlers and/or demersal seiners 12-< 18 m*". The operation of boat seines during 2021 was suspended by ministerial decision (145/296596/2020). The vessels included in this category have been allocated to different fishing segments based on their updated primal fishing gear (if any).

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Different clustering procedure is not an unwanted deviation that can be avoided. This is also the case for boat seines

(max. 900 words)

SECTION 6: ECONOMIC AND SOCIAL DATA IN AQUACULTURE

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

Please provide a percentage for the Member State's production from the latest EU aquaculture production reported to Eurostat. Describe and justify the applied threshold(s).

According to EUROSTAT, Greece's annual total production for 2019 amounts to11,55% compared to EU total and the data collection will include the following four segments in percentage of the total Greek aquaculture production volume:

Seabass – seabream = 75,15%

Mussels=18,25%

Trout≈2%

Freshwater fish≈2%

Based on the above information, for the seabass-seabream and mussel categories no thresholds will be applied since they are the main aquaculture activities holding the greater percentage of the sector. For trout and freshwater fish aquaculture, despite the fact they are below the threshold, they will be included in the survey due to their importance in regional development, since they consist of very small companies spread throughout the Greek territory, mostly in areas with low employment rates and their contribution to local economies is considered significant in socio-economic terms.

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

Describe and justify any deviations from variable definitions as listed in 'EU MAP Guidance Document' in the DCF website.

NA
(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

There were no deviations

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.
Not applicable
(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.

1. The Member State should provide justification for complementary data collection for fish processing in addition to Eurostat data.

In Greece, the traditionally important, due to its geographical location, fishing industry has led to the development of fisheries processing industry on almost all the coastal areas with intense economic activity. The industry has played a key role in both social and economic sectors. The term fish processing refers to the processing activities associated with fish and fish products from the time fish are caught or harvested from aquaculture to the development of the final product. Activities like freezing, processing (filleting, salting, drying, smoking, marinating, cooking, canning) of fish, and the de-shelling of mussels are included in the Greek fishery processing sector.

The fish processing sector data collection will continue under the new NWP for Greece for the following reasons:

- Greece is interested in collecting fish processing data with wider data disaggregation in terms of employment categories than Eurostat which excludes companies in the <11 employees' sector since, for the fiscal year 2018, the number of companies with 0-10 employees that participated in the survey number was 130 in a total of 168 companies with fish processing activities in Greece (77,4%).
- Regarding the social data, the fisheries processing program will continue to collect, in continuation of the previous pilot studies, a wide aspect of the sector's workforce data including among others education, nationality and age, covering the small companies as well and expanding the established socio-economic time-series data analysis of the sector.

Furthermore, the data collection will gather information on raw material volume and value following under a new categorization: 1) by size of firm (0-10 employees, 11-49 employees, 50-249 employees and over 250 employees), 2) by origin (domestic products, products from EU countries, products from non-EU/EAA countries), 3) wild or farmed products, thus connecting the raw material purchases with fleet and aquaculture sector and 4) by the final form of the product (frozen, tinned, smoked, salted, dried or in brine).

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

NA

Describe and justify any deviations from variable definitions as listed in 'EU MAP Guidance Document' in the DCF website.

(max. 900 words)

Deviations from the work plan
List the changes from work plan (if any) and explain the reasons.

There were no deviations

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Not applicable

(max. 900 words)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries.

Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Provide short descriptions where indicated, even if the documentation can be found in English. 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'.

(Sampling scheme identifier: ScientOBsYell_EMUx)

MS: GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: ScientOBsYell_EMUx
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French in French, Portuguese, and Spanish).*   All data (length, weight, age, sex etc) for yellow eels will be collected from sampling in lagoons in different EMU per year. These samplings be performed by fyke nets, which will placed consecutively in random stations in the lagoon and their position will be changed every week in order to cover the whole area of the lagoon.
Description of the population
Population targeted: *Specify the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area* Yellow eels' samples will be collected by the use of fyke nets. The samplings will be carried out in one river basin within a different EMU annually. **Population sampled***: Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea*

describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys

Samplings will be focused on catching yellow eels in different EMU every year.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction*

This methodology is spatially stratified based on the assessment of all EMUs', where eels are present, in a three-year period. Due to the critical condition of the stock and the already collected data, only 50 samples of the species will be collected as part of the biological sampling, from a different EMU every year, specifically for the 2022 the samples will be collected from EMU 1, for 2023 the samples will be collected from EMU 2 and for 2024 collected from EMU 3. All other biological parameters (weight, sex ratio and age) will be reported at the end of the three years working plan (150 individual from all EMUs).

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

The sampling plan for the yellow eels, which occur in lagoons or lakes, includes the use of fyke nets. These fyke nets, are two cylindrical shape structures with three compartments joined by a leader. The number of fyke nets that will be used depends on the total area covered by each ecosystem. They will be used consecutively and placed in random stations. Their position will be changed every week in order to cover the whole area of the lagoon/lake. The captured yellow eels will be stored in refrigerators and transported to the laboratory for further analysis (measurements of biological variables, abundance, etc.). This methodology will be applied in different EMU every year, in order to have enough data to estimate the standing population in Greece.

Is the sampling design compliant with the 4S principle? *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

For the data collection for yellow eel, the applied sampling scheme follows the sampling plans that already used for yellow eels' samplings by other EU countries.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox*

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators*

Y

Link to sampling protocol documentation*: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox*
http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE_Eel_Methodology-data QAF_2020.pdf

Sampling implementation

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

NA

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

Samplings depend on the availability of the fisherman and the weather. In cases where the sampling cannot be performed, new saplings will be rescheduled for the next available day, without exiting three days period.

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what the means for collecting the data are, e.g. scales, measuring board, dedicated software, etc*

<u>Biological parameters for silver and yellow eel</u>
For each individual, were recorded:
1. the length of the body, using a fish meter specially designed for measurement of the total length of the eels to the nearest 1 mm,
2. body weight, using a digital precision scale (± 0.1 gr)
3. the diameter of the eye, using a precision digital caliper (± 0.01mm)
4. the fin length, using a precision digital caliper (± 0.01mm)
5. the number of the parasites, *A. crassus* in the swim bladder.

<u>Otolith's removal</u>

The otoliths were removed from the head of the eels with scalpel and forceps, cleaned with water and stored dry in Eppendorf tubes until they were processed.

Otolith's procession and age estimation
For the processing of otoliths, were used:
1. a scalpel for otolith breaking,
2. a hotplate, for burning process of the otolith's pieces,
3. a stereoscope connected to a camera and a tablet, for the observation and photography,
4. an image processing software for the annuli observation of otoliths and the age estimation

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox)*

Information provided in the Text box 2.3

Quality checks documentation: *Indicate 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box*

Y

All the biological data are subject to various quality checks, with main purpose to detect missing data, outliers and misprints

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website*

Database of the Fisheries Research Institute (FRI)

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website*

 NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box*

All the biological data are subject to various quality checks, with main purpose to detect missing data, outliers and misprints.

Sample storage

Storage description: *Storage description: Indicate the type of soft tissues and hard parts stored (e.g., age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.*

The otoliths are stored in plastic tubes «Eppendorf» in which the day and the fishing area are written. In Eppendorf, otoliths can be stored for years

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

Sample analysis: otoliths were processed according to the "modified Crack & Burn protocol by FRI", following the steps below:
1. Drying otoliths in an oven.
2. Cracking of the otolith as close as to center of the nucleus.
3. Burn both pieces on a hotplate at 400°C.
4. Let them cool down to room temperature.
5. Cleaning and polishing of the broken face of the otolith using a 1000 and 2000 grit grinding paper.
6. Etching of the broken face with 1-2 drops of 1% HCl
7. Repeat steps 3-6 until the desired result, the emergence of the otoliths annual rings.
8. Observation of the otoliths under stereoscope immersed in glycerine.
9. Photo shooting.

Data processing

Evaluation of data accuracy (bias and precision*): Indicate 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox*

Y
The evaluation of the data is performed every year by WGEEL group of ICES, in the context of the annually data calls.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox*

Y
 Editing and imputation methods for the data concerning eel biological parameters, the general guidelines on data quality methods applied on Greek DCF biological data, are followed according to the

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Sampling%20scheme%20%26%20Data%20Quality%20Assurance%20Framework_2019.pdf

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE_Eel_Methodology-data QAF_2020.pdf

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*

National SQL Database - expert validation

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Description of the population
No deviations from the work plan occurred regarding the population planned and sampled.

Sampling design and protocols
No deviations from the work plan occurred regarding Sampling design and protocols.

Sampling implementation
No deviation from the work plan occurred regarding the sampling implementation.

Data capture
No deviations from the work plan occurred regarding data capture.

Data storage
No deviations from the work plan occurred regarding data storage.

Sample storage
No deviations from the work plan occurred regarding sample storage.

Data processing
No deviations from the work plan occurred regarding data processing.

(Sampling scheme identifier: ScientCommSilv_EMUx)

MS : GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: ScientCommSilv_EMUx
Sampling scheme type: Diadromous (commercial)
Observation type: SciObsOnShore
Time period of validity: from when until when:2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*   All biological data (length, weight, age, sex, parasites) for silver eels come from the commercial fisheries in lagoons. Specifically, silver eel samples will be collected from the permanent installed fishing devises in the channel connecting the lagoons with the sea that are operated by Fishing co-operatives.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.   Silver eel samples will be collected from the permanent installed fishing traps in the channel connecting the lagoons with the sea that are operated by Fishing co-operatives   **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.   Sampling will be focused on catching silver eels in different EMU every year.   **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*   This methodology is spatially stratified based on the assessment of all EMUs', where eels are present, in a three-year period.   Length will be collected from 200 samples per year from each EMU.   Due to the critical condition of the stock and the already collected data, other biological parameters (weight, age, sex ratio, parasites) will be collected from 100 samples, from a different EMU every year. Specifically for the 2022 the samples will be collected from EMU 1, for 2023 the samples will be collected from EMU 2 and for 2024 from EMU 3. All other

biological parameters will be reported at the end of the three years working plan (300 individual from all EMUs).

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

All the data and samples for silver eels will be come from the commercial fisheries in lagoons, from each EMU. As is well known, eel fishery in Greece is only allowed to be performed in lagoons by the local Fishermen Cooperatives, who are responsible for the lagoon exploitation. Fishing in the lagoons is based on the use of fixed barrier traps, concrete constructions, which are installed at the interface between the lagoon and the sea and cover all the width of the connection channel. They are passive, V-shape traps, fixed gears which catch all migrating fish, eels in particular, during their seasonal and reproductive migration. In these traps, all migrating silver eels are caught during their reproductive spawning migration. Then, the captured silver eels are stored live in adequate infrastructure until their sale is complete.

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

For the data collection for each life stage of European eel, the different methodological approach (sampling plan), that will be applied, follow the sampling plans that already used for eel samplings by other EU countries.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE_Eel_Methodology-data QAF_2020.pdf

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE_Eel_Methodology-data QAF_2020.pdf

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

Sampling implementation

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

NA

Monitoring of sampling progress within the sampling year: *Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?*
The samplings of silver eels monitoring depend on the period of fisheries allowance

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

Biological parameters for silver and yellow eel
For each individual, were recorded:
1. the length of the body, using a fish meter specially designed for measurement of the total length of the eels to the nearest 1 mm,
2. body weight, using a digital precision scale (± 0.1 gr)
3. the diameter of the eye, using a precision digital calliper (± 0.01mm)
4. the fin length, using a precision digital calliper (± 0.01mm)
5. the number of the parasites, *A. crassus* in the swim bladder.

Otoliths removal
The otoliths were removed from the head of the eels with scalpel and forceps, cleaned with water and stored dry in Eppendorf tubes until they were processed.

Otoliths procession and age estimation
For the processing of otoliths, were used:
1. a scalpel for otolith breaking,

2. a hotplate, for burning process of the otolith's pieces,

3. a stereoscope connected to a camera and a tablet, for the observation and photography,

4. an image processing software for the annuli observation of otoliths and the age estimation

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

Information provided in the Text box 2.3

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

Y

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

Database of the Fisheries Research Institute (FRI)

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

 NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

All the biological data are subject to various quality checks, with main purpose to detect missing data, outliers and misprints.

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

The otoliths are stored in plastic tubes «Eppendorf» in which the day and the fishing area are written. In Eppendorf, otoliths are stored for many years.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

Sample analysis: otoliths were processed according to the "modified Crack & Burn protocol by FRI", following the steps below:

1. Drying otoliths in an oven.
2. Cracking of the otolith as close as to center of the nucleus.
3. Burn both pieces on a hotplate at 400°C.
4. Let them cool down to room temperature.
5. Cleaning and polishing of the broken face of the otolith using a 1000 and 2000 grit grinding paper.
6. Etching of the broken face with 1-2 drops of 1% HCl
7. Repeat steps 3-6 until the desired result, the emergence of the otoliths annual rings.
8. Observation of the otoliths under stereoscope immersed in glycerine.
9. Photo shooting

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*
Y
The evaluation of the data is performed every year by WGEEL group of ICES, in the context of the annually data calls.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*
Y
Editing and imputation methods for the data concerning eel biological parameters, the general guidelines on data quality methods applied on Greek DCF biological data, are followed according to the
http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Sampling%20scheme%20%26%20Data%20Quality%20Assurance%20Framework_2019.pdf

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE_Eel_Methodology-data QAF_2020.pdf

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*
National SQL Database - expert validation

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.
Description of the population

No deviations from the work plan occurred regarding the population planned and sampled.

Sampling design and protocols
No deviations from the work plan occurred regarding Sampling design and protocols. .

Sampling implementation
No deviation from the work plan occurred regarding the sampling implementation.

Data capture
No deviations from the work plan occurred regarding data capture.

Data storage
No deviations from the work plan occurred regarding data storage.

Sample storage
No deviations from the work plan occurred regarding sample storage.

Data processing
No deviations from the work plan occurred regarding data processing.

(Sampling scheme identifier: GR_REC_OfS)

MS : GRC	
Region: Mediterranean and Black Sea	
Sampling scheme identifier: GR_REC_OfS	
Sampling scheme type: recreational (off site surveys)	
Observation type: SelfOnShore	
Time period of validity: from when until when: 2022-2024	
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* The survey's main purpose will be the estimation of the number of recreational fishers in Greece and additionally the recording of demographic characteristics of the fishers as well as their fishing practices. A telephone survey will be conducted during 2022 by a market research and opinion polls agency. The sample will be geographically stratified, in order to be consistent and accurate for all the regional units and it will be weighted appropriately based on the proximity of the residents to the sea. Furthermore, a more detailed data survey will be conducted as an additive off-site self-reporting tool in a website (https://erasitexniki.inale.gr) and in an app (android and ios).	
Description of the population	

Population targeted: *Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.*

The Target Population are residents of the country, men and women aged 15 years and over in all urban, semi-urban and rural areas of mainland and island Greece. The Primary Sampling Unit (PSU) will be the households of recreational fishers in Greece. Computer Assisted Telephone Interviews (CATI) using a structured questionnaire will be implemented, depending on whether the respondent will be a recreational fisher or no.

Population sampled: *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.*

The method of selecting sample for the telephone statistical survey will be geographically stratified from RDD (Random Digit Dialling) telephone numbers. In order to identify the number of recreational fishers, since a license system is not available in Greece, the telephone survey will play the role of a screening framework in 2022, covering a broad range of the Greek territory, according to the directives of the data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021). The justified concern for the declining trend of landlines and the increasing usage of cellular devices is legitimate (Link et al. 2008), though the telephone survey will include cellular device numbers and the website-app circumvents the potential exclusion problem

REFERENCES

Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO. https://doi.org/10.4060/cb5403en

Link, M.W., Battaglia, M.P., Frankel, M.R., Osborn, L. & Mokdad, A.H. 2008. A comparison of address-based sampling (ABS) versus random-digit dialing (RDD) for general population surveys. Public Opinion Quarterly, 72(1): 6–27.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The selection of the sample is based on stratified random sampling where the 58 prefectural units of the country were used as strata. The spatial stratification takes into account the population of each regional unit and uses a sample frame of fixed and mobile phones with quotas regarding the characteristics of the regional units. The sample of the survey will be weighted based on the proximity of the unit to the sea using three categories: insular regional unit, regional units with access to the sea, landlocked or limited access to the sea. During the research, the sampling distributions based on the gender, age, and educational level of the respondents will be monitored.

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

The research population will consist of individuals aged 15 and over, men and women who can communicate in the Greek language regardless of nationality and were recorded during the latest population census of the Hellenic Statistics Authority.

The selection of the sample will be based on stratified random sampling where the prefectural units were used as strata (The following steps will be followed to find the sample):

• The sample distributions based on gender, age, and educational level of the respondents will be monitored.

• Successful telephone interviews, denials of participation as well as absences occurred during the telephone calls will be recorded

• In case of absence, a second call will be made at a different time and / or day as a second attempt to find the respondent. In case the 2nd call will not be answered then this household will be replaced by another.

• Those households that agreed to participate in the survey will fall into the category "Successful telephone interviews". The whole questionnaire will be conducted in these households depending on whether the respondent is recreational fisher or not.

• From all the successful interviews will emerge households with one or more recreational fishers and households that had no one engaged in recreational fishing. In case there were more than one member of the household engaged in recreational fishing, this information will also be recorded.

• Interest in participating in a more detailed data survey will be recorded. If there will be interest, the contact details of the recreational fisher will be requested and recorded only in the case of an adult and details regarding the site (https://erasitexniki.inale.gr) and app will be provided. During this process, all prescribed rules of personal data protection will be applied.

Is the sampling design compliant with the 4S principle? *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes).*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement. However, the survey follows the general guidelines of the latest handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021)

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

The survey questionnaire consists of numbered questions (and some additional questions in case the respondent expresses interest for using the site and app). Most of the questions will be closed-ended questions and few of them will be open-ended. The average duration of interviews is expected to be about 5 minutes.

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*

The sampling design documentation follows the guidelines of the latest handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021)

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

The sampling protocol consists of questions that answer the main objectives of the survey which are the estimation of the number of recreational fishers in Greece, the recording of their basic demographic characteristics, the recording of their fishing practices and the exploration of their interest (of respondents who declared themselves as recreational fishermen) to participate in a more detailed data collection scheme.

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

The sampling design documentation follows the guidelines of the latest handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021).

Sampling implementation

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

Y

A technical document will (2023) be made publicly available explicitly and analytically describing the methodologies used for handling recreational fisheries data under the Greek

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

The telephone survey has a duration of few months. During the survey, daily inspections will be carried out in order to determine the consistent conduct of the survey by the researchers. The methodology that will be followed will be that of the parallel co-hearing of the interviews

by the supervisors of the Telephone Research department, as a percentage of the work of each interviewer. Also, at regular intervals from the beginning of the project coders receive the completed questionnaire file and check the logical flow of each question, as well as coding open-ended questions. At the end of the survey, 100% of the completed questionnaires will be checked for any inconsistent answers or incorrectly entered values. Maximum sampling error will be calculated at a typical 95% confidence interval.

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

The telephone survey is a quantitative research method, following the Computer Assisted telephone interviews (CATI) approach and using a structured questionnaire.

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

NA
The structure of the telephone survey's questionnaire has not developed yet. The number of questions and the content of closed-ended and open-ended questions will be decided by experienced researchers and technical faculty.

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

Y
A technical document will (2023) be made publicly available explicitly and analytically describing the methodologies used for handling recreational fisheries data under the Greek DCF

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

The telephone survey will be conducted by a market research and opinion polls agency; thus, the results will not be stored in a database The results of the website and app research will be private and not accessible to the public.

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*
NA

Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.

During the survey, daily inspections will be carried out in order to determine the consistent conduct of the survey by the researchers. The current data collection framework follows the latest directives of the Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. More specifically the templates of Annexes 3-5 (Grati et al. 2021, p.55-63), which ensure data quality and validity of the results.

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

NA

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

NA

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*

Y

The sampling errors of the survey for a percentage of p, will be calculated with the assumption of simple random sampling at a confidence level of 95%, with the following formula: Sampling Error = $1.96 * \sqrt{(p * q / n)}$ where p is the estimated percentage, q = 1-p and n the sample size. Statistical controls: Statistical data analysis and statistical tests will be performed using a relevant statistical package. Statistical tests to identify statistically significant differences between socio-demographic categories for each question in the questionnaire will be performed at a significance level of 0.01% (p value <0.01). The X_2 test will be used to compare responses between discrete variables. One-way analysis of variance (ANOVA) will be used to compare discrete and quantitative variables.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

N

The document which describes the general guidelines on data quality methods applied on the Greek Recreational Fisheries will be published (2023), explicitly and analytically describing the methodologies used for handling relevant data under the Greek DCF. Currently the guidelines for data accuracy in recreational fisheries follow the latest directives of FAO in the Mediterranean and the Black Sea (Grati et al. 2021):

http://www.fao.org/3/cb5403en/cb5403en.pdf

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed*?

A technical document will (2023) be made publicly available explicitly and analytically describing the methodologies used for handling recreational fisheries data under the Greek DCF

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*

The final datasets will be subject to various quality checks, with main purpose to detect the structural errors in the provided datasets and possible mistakes by the market research and opinion polls agency.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

There were no deviations for the off-site survey.
A technical document titled '**Methodology and Data Quality Assurance Framework for Recreational Fishing**' **is now** publicly available describing the methodologies used for handling recreational fisheries data under the Greek DCF in: **https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf**

(Sampling scheme identifier: GR_REC_OnS)

MS : GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: GR_REC_OnS
Sampling scheme type: recreational (on site surveys)
Observation type: SciObsOnShore
Time period of validity: from when until when: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* The applied sampling scheme will be carried out in parallel with the off-site surveys (GR_REC_OfS). It is a spatially, temporally, and technically stratified random sampling scheme, recording fishing trips along with socio-economic, catches from randomly selected sites in geographical areas covering the two representative GSAs (20, 22). The locations of the sampling scheme include piers, ports, beaches and remote sites, in order to record in situ all fishing activities (boat, coast and spear fishing), catches (species, numbers) and to validate the reliability of the data reported from the off-site survey.
Description of the population
Population targeted*: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.* The Primary Sampling Unit (PSU) is the fishing trip for recreational fishing. The Target Population is recreational fishers performing all three types of MRF in Greece namely boat, coast and spearfishing per GSA, for the reference years. A licensing system for recreational fisheries does not exist in the country, thus the on-site survey will add and complete the results of the telephone survey, which main purposes are mainly the estimation of the number of recreational fishers in Greece, demographic characteristics (such as sex, age, education level etc.) and fishing practices. **Population sampled:** *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.* The population sampled are the recreational fishers for all three types of MRF namely: boat, coast and spearfishing in the Greek territory. In order to identify the number of recreational fishers, since a license system is not available in Greece, a screening survey should be conducted every three years, covering the whole of the country, according to the directives of the data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021). Since the target population is defined via the telephone survey in 2019, the on-site

sampling scheme will include recreational fishers in randomly selected sites and their fishing trips for the three MRF types of fishing (boat, coast and spearfishing). For the WP 2022-24 the rationale behind on-site sampling is the collection of primary data and validation of the reliability in comparison with the self-reported off-site surveys. A randomized probabilistic design will be followed in order to collect primary data, after the fishing effort has taken place. Furthermore, the on-site survey which is a multispecies survey, will provide additional data, such as catch rate, catch size, taxa composition and efficiency of each MRF type of fishing. However, identification and tracking of spearfishing activities remain a notable problem, so the establishment of solid and credible relationships with MRF federations and associations is a constant and continuous endeavor which continues until today, in order to attain spear fishers' participation.

REFERENCE

Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO. https://doi.org/10.4060/cb5403en

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The applied sampling scheme is spatially, temporally, and technically stratified. The spatial stratification takes into account that MRF activities cover Aegean Sea and Ionian Sea. Furthermore, the sampling scheme is temporally stratified seasonally, by quarter, to conform with seasonal variations of all fishing activities and species' composition. Finally, the technical stratification is related to the different types of MRF (the three major types of fishing as described by the Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021)), along with the relevant fishing gears and techniques

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

The methodological framework facilitates the proposal of an "optimal" sampling plan (in terms of number of trips and individuals to sample) following the process integrated with the outcomes of the first meeting of the Working Group on Small-Scale and Recreational fisheries (WGSSF) (GFCM, 2017) and the documentation of sampling design of the ICES Working Group on Recreational Fisheries Surveys (WGRFS) (ICES, 2013). According to the guidelines, the sampling design targets the whole population of recreational fishers with non-overlapping PSUs and well-defined strata. In principle, the on-site sampling design includes samples that will be chosen randomly in specific fishing sites after the end of the fishing effort. The methodological framework of the on-site survey follows a randomized probabilistic design. Apart from the abovementioned, the sampling design will record non-response rates, whilst diagnostics of reported results will be handled by faculty members in order to enhance the validity of the responses.

REFERENCES:

ICES, 2013. Report of the ICES Working Group on Recreational Fisheries Surveys 2013 (WGRFS), 22–26 April 2013, Esporles, Spain. (Last accessed: 29 September 2021). http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGRFS%20 2013/WGRFS%20Report%202013.pdf

GFCM, 2017. Report of the first meeting of the Working Group on Small-Scale and Recreational fisheries (WGSSF). FAO headquarters, Rome, Italy, 12–13 September 2017. (Last accessed 29 September 2021). http://www.fao.org/gfcm/technical-meetings/detail/en/c/1061844/

Is the sampling design compliant with the 4S principle? *Y/N/NA (NA for e.g., surveys and diadromous and recreational sampling schemes)*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

http://www.fao.org/3/cb5403en/cb5403en.pdf

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*

The sampling design documentation follows the guidelines of the latest handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021)

Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO. https://doi.org/10.4060/cb5403en

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

Regarding the sampling framework, specialized and trained interviewers use dedicated protocols for recording each fishing trip. These protocols are appropriately designed in order to record trip (Trip ID, Info metadata ID, date and time of departure and return, type of fishing, fishing area etc.), gear (gear ID, gear type applied and relevant information, target species,

soaking time, bait used), species (species name, individual number, total weight) and individual related information if available (length of individuals of all species and separate weights). The protocols used are appropriately designed according to the latest directives of FAO and WGRFS.

Link: http://www.fao.org/documents/card/en/c/cb5403en

REFERENCE

Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO.

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

Sampling implementation

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

Y

A technical document will (2023) be made publicly available explicitly and analytically describing the methodologies used for handling recreational fisheries data under the Greek DCF

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

The sampling progress is monitored and checked in a regular basis, to detect possible deviations from the spatial and temporal design of the applied sampling scheme. Furthermore, every sampling period (i.e., each quarter of the sampling season) the interviewers gather more questionnaires than needed, in order to avoid possible data limitations and mistakes

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

Specialized interviewers follow a standardised protocol when introducing themselves to a potential interviewee on-site. At the beginning interviewers tell their name and describe the details of the institutes register. Moreover, the objective of the study is thoroughly explained and the anonymity of the interviewee is ensured. Furthermore, the interviewers request and record general information for each specific fishing trip according to the template for on-site surveys (Annex 6.a) in the Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea (Grati et al. 2021). Finally, the interviewers are specialized

to recognize different species and use standard scales for recording sample per species, while measuring boards are used for recording individual lengths

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

Link: http://www.fao.org/documents/card/en/c/cb5403en

REFERENCE:
Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO.

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

The quality check documentation will be available later in 2023. The current data collection framework follows the latest directives of FAO and WGRFS.

REFERENCE
Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO. http://www.fao.org/documents/card/en/c/cb5403en

ICES, 2013. Report of the ICES Working Group on Recreational Fisheries Surveys 2013 (WGRFS), 22–26 April 2013, Esporles, Spain. (Last accessed: 29 September 2021). http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGRFS%20 2013/WGRFS%20Report%202013.pdf

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

The relevant data are stored in the FRI and HCMR local databases, that feed the National Data Base. These data bases are not accessible through a website

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

All the relevant data are subject to various quality checks, with main purpose to detect outliers, misprinting, species misidentification and discrepancies between gear of fishing and species caught.

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year

NA.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

NA

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*

The document which describes the general guidelines on data quality methods applied on the Greek Recreational Fisheries will soon be published (within 2023), explicitly and analytically describing the methodologies used for handling relevant data under the Greek DCF. Currently the guidelines for data accuracy in recreational fisheries follow the latest directives of FAO in the Mediterranean and the Black Sea (Grati et al. 2021): http://www.fao.org/3/cb5403en/cb5403en.pdf

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

The document which describes the general guidelines on data quality methods applied on the Greek Recreational Fisheries will soon be published (within 2023), explicitly and analytically describing the methodologies used for handling relevant data under the Greek DCF. Currently the guidelines for data accuracy in recreational fisheries follow the latest directives of FAO in the Mediterranean and the Black Sea (Grati et al. 2021): http://www.fao.org/3/cb5403en/cb5403en.pdf

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

A technical document will soon (within 2023) be made publicly available explicitly and analytically describing the methodologies used for handling recreational fisheries data under the Greek DCF.

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user*?

The final datasets are subject to various quality checks, with main purpose to detect the structural errors in the provided datasets and non-sampling errors. Specific control functions are performed as described by *Grati et al.* (2021). Nevertheless, for most purposes the WGRFS quality assurance toolkit is used, in order to assess the quality of recreational fishing data (ICES, 2013, p. 43-45) (Annex 5).

REFERENCE

Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No. 669. Rome, FAO. http://www.fao.org/documents/card/en/c/cb5403en

ICES, 2013. Report of the ICES Working Group on Recreational Fisheries Surveys 2013 (WGRFS), 22–26 April 2013, Esporles, Spain. (Last accessed: 29 September 2021). http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGRFS%20 2013/WGRFS%20Report%202013.pdf

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan**.**

There were no deviations for the on-site survey.

A technical document titled '**Methodology and Data Quality Assurance Framework for Recreational Fishing' is now** publicly available describing the methodologies used for handling recreational fisheries data under the Greek DCF in: **https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf**

(Sampling scheme identifier: SeaComTripallsp)

MS : GRC	
Region: Mediterranean and Black Sea	
Sampling scheme identifier: SeaComTripallsp	
Sampling scheme type: Commercial fishing trip	
Observation type: SciObsAtSea	
Time period of validity: from when until when: 2022-2024	

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

The applied sampling scheme is a spatially, temporally, and technically stratified random sampling scheme recording all catch fractions, aiming to collect length and catch data for all

the species of Table 1 of the EU MAP Delegated Decision annex that are relevant for Greece, and the species of Appendix A.3 of GFCM-DCRF. The species are listed in Table 2.1 of the Greek Work Plan. Additional data are collected on certain biological variables (Age, Weight, Sex ratio and Maturity) for selected species included in table 2.2 of the Greek Work Plan. The Planning of sampling for biological variables follows recommendation 10 of RCG Med & BS 2021. Sampling is performed on-board the fishing vessels of selected metiers, by scientific observers. The sampling scheme is also applied to collect Protected, Endangered and Threatened (PET) species related information in selected metiers.

Description of the population

Population targeted*: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.*

The Primary Sampling Unit (PSU) of the Greek sampling scheme is the fishing trip. The Target Population is all the fishing trips conducted by all commercial vessels of the Greek fishing fleet per GSA, for the reference years. The source of data is the Official National Fleet Registry and the DCF data collection system in the reference years.

Population sampled: *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.*

The population sampled is the fishing trips of the vessels engaged in selected métiers. In order to identify the métiers to be sampled, the ranking system described in Commission Decision 2010/93/EU is used at level 6. The métiers are ranked according to their share in the total commercial landings, total value and total effort in days at sea until a cut-off level of 90 % is reached. All métiers belonging to the top 90% of each variable (effort, landings, value) are selected for sampling, For the WP 2022-24 the ranking was based on average landings, value and effort over the years 2018-2020, resulting in seven métiers: Bottom otter trawls targeting demersal species (OTB_DEF_>=40_0_0), purse seines targeting small pelagic fish (PS_SPF_>=14_0_0), set gillnets for demersal fish (GNS_DEF_>=16_0_0), set trammel nets for demersal fish (GTR_DEF_>=16_0_0), set long lines for demersal fish (LLS_DEF_0_0_0), drifting long lines for large pelagic fish (LLD_LPF_0_0_0), pots and traps for demersal species (FPO_DEF_0_0_0). Additionally, the sampled population includes the beach and boat seine for demersal species métier (SB_SV_DEF_0_0_0), although not picked up by the ranking system, due to its special importance in terms of management.

The part of the population that is excluded from sampling is the fishing trips of the vessels engaged in métiers that were not selected for sampling by the ranking system. However, it has to be stressed that total landings and effort data are recorded for every metier applied by the Greek fishing fleet.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The applied sampling scheme is <u>spatially</u>, <u>technically</u>, and <u>temporally</u> stratified. The spatial stratification takes into account that Greek fishing activities cover **3** GSAs: (a) Aegean Sea (GSA 22), (b) Ionian Sea (GSA 20) and (c) Cretan Sea (GSA 23). Furthermore, in each GSA the technical stratification is related to the **8** <u>different métiers</u> sampled (the selected eight métiers of the target population of the Greek sampling scheme). Finally, the sampling scheme is temporally stratified, by quarter, to conform with seasonal variations of fishing activity, as well as of stock related variables.

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

The estimation of the total sampling effort for biological variables as well as its temporal and spatial distribution are calculated based on a ranking system using the corresponding distribution of fishing effort, number of fishing vessels and total landings and discards between the different strata in the reference years. This process is integrated with the outcomes of the application of the methods delivered under MARE/2014/19Med&BS project (Deliverable 2.5 and 4.2) implementing the Sampling Design tool for optimization of sampling intensity and data quality checks. The methodological framework developed in WP2 of MARE/2014/19 MED&BS is implemented in R scripts built on COSTS tools and it allows the analysis of the evolution of the sampling variability with the number of samples, the assessment of the current plans in terms of over/under-sampling of the fisheries and it facilitates the proposal of an "optimal" sampling plan (in terms of number of trips and individuals to sample) disaggregated over strata (e.g. quarters and métiers).

For the selection of sampling trips within each stratum a Simple Random Sampling with Replacement is applied, using a list of vessels that were operated the previous year in each GSA and in each metier. The order of appearance of the vessels in the list is random and the selection of the vessel follows the order of appearance in the list.

The species for which length and additional biological parameters are collected, are described in the Tables 2.1 and 2.2 of the Greek WP respectively (see also TextBox 2.5) The PET species for which data are collected are those included in the FAO (2019) manual. For these species, all catch fractions – landings, discards, and incidental catches (Protected, Endangered and Threatened, PET species) – are recorded by the on-board observers.

Working group on biological parameters (WGBIOP):

Link:

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGBIOP%202019.pdf

Monitoring incidental catch of vulnerable species in the Mediterranean and the Black Sea: methodology for data collection
Link: http://www.fao.org/documents/card/en/c/ca4991en/

REFERENCE:
FAO. 2019. Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 640. Rome, FAO

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

 Y

The sampling design followed is in compliance with 4S principle, since it has clearly defined target population and sampling frame, clearly identified strata and clearly defined probabilistic methods for sample selection that provide samples as free as possible from selection biases

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*
Y
The sampling design follows the annual recommendations for biological data of the Regional Co-ordination Group for the Mediterranean and Black Sea (RCG Med&BS).

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*
For biological sampling, on-board observers use dedicated protocols for multi-taxa data collection. These protocols are appropriately designed in order to record trip (Trip ID, Vessel ID, date and time of departure and return, number of hauls, landing port etc), haul (Haul ID, type of métier applied and relevant information, depth, coordinates, haul duration, weather conditions, target species), species (species name, catch fraction, total weight, sample weight, sample number) and individual related information (Length of individuals of all species).

Samples for selected species (see Table 2.2 of WP) are taken to the laboratory for recording additional biological data (sex, maturity, weight, and age), The protocols used in laboratory are appropriately designed to link samples to fishing trips (Trip ID and species name is recorded) as well as to record biological data, such as individual weight, sex, maturity stage and otolith extraction indicator (Y or N) and age (after age reading).

For PET sampling, the protocols used are provided by the GFCM report on the Methodology for incidental catch of vulnerable species data collection (FAO, 2019).
Link: http://www.fao.org/documents/card/en/c/ca4991en
REFERENCE
FAO. 2019. Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 640. Rome, FAO

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*

N

Sampling implementation

Recording of refusal rate: *Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.*
N
Documentation will be available till the end of 2024**.**

Monitoring of sampling progress within the sampling year: *Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?*
The sampling progress is monitored and check in a monthly basis, in order to detect possible deviations from the spatial and temporal design of the applied sampling scheme. Whenever the target for sampling within a quarter and for any metier is not reached, the obligation is transferred to the next quarter

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software*, ...

On board observers use standard scales for recording sample and total weight per species and per catch fraction and measuring boards for recording individual lengths. For measuring specimens' individual weight in the laboratory, high accuracy weight scales are used (individual weight is recorded to a precision of two decimal places). Sex and maturity determination is performed macroscopically, following the guidelines from GFCM Data Collection Reference Framework (DCRF- GFCM, 2018) and Follesa & Carbonara (2019). Age reading on otoliths is facilitated by stereomicroscopes fitted with digital cameras of high

resolution connected with external control unit (tablet) as well as by image processing software (Image J). Age reading follows the guidelines from Carbonara & Follesa (2019).

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

- GFCM, 2018. GFCM Data Collection Reference Framework (DCRF).
- Follesa, M.C., Carbonara, P., eds. 2019. Atlas of the maturity stages of Mediterranean fishery resources. Studies and Reviews n. 99. Rome, FAO 268 pp.
- Carbonara, P., Follesa, M.C., eds. 2019. Handbook on fish age determination: a Mediterranean experience. Studies and Reviews. No. 98. Rome, FAO. 2019. 192 pp.

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Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*
Y

- GFCM, 2018. GFCM Data Collection Reference Framework (DCRF).
- Follesa, M.C., Carbonara, P., eds. 2019. Atlas of the maturity stages of Mediterranean fishery resources. Studies and Reviews n. 99. Rome,FAO. 268 pp.
- Carbonara, P., Follesa, M.C., eds. 2019. Handbook on fish age determination: a Mediterranean experience. Studies and Reviews. No. 98. Rome, FAO. 2019. 192 pp

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

The relevant data are stored in the FRI and HCMR local databases, that feed the National Data Base. These data bases are not accessible through a website.

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International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*
NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

Biological data are subject to various quality checks, using dedicated R scripts, with main purpose to detect outliers, misprinting, species misidentification etc.
https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the

auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

For age reading, otoliths extracted by selected species are processed based on GFCM (2018) and Carbonara & Follesa (2019) manuals. The otoliths are stored within dedicated storage units in FRI and HCMR facilities, under the institutes' responsibility. The otoliths are stored indefinitely. The quantities of otoliths per species stored are in compliance with the annually reported number of age-specified individuals in Greek Annual reports.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

- GFCM, 2018. GFCM Data Collection Reference Framework (DCRF).
- Carbonara, P., Follesa, M.C., eds. 2019. Handbook on fish age determination: a Mediterranean experience. Studies and Reviews. No. 98. Rome, FAO. 2019. 192 pp.

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*
Y
Information for the data accuracy can be found in:

https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

This document describes the general guidelines on data quality methods applied on Greek DCF biological data, Analytical information on the methodologies used for handling biological data under the Greek DCF can be found in:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality Assurance of Estimation Methods.pdf

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*
Y
Information for the data accuracy can be found in:

https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

This document describes the general guidelines on data quality methods applied on Greek DCF biological data, Analytical information on the methodologies used for handling biological data under the Greek DCF can be found in:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality Assurance of Estimation Methods.pdf

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed*?

Analytical information on the methodologies used for handling biological data under the Greek DCF can be found in:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality   Assurance   of Estimation Methods.pdf

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*

The final datasets are subject to various quality checks, using dedicated R scripts, with main purpose to detect the structural errors in the provided datasets (such as duplicated or missing information etc.). For most purposes, the Standard Data-Exchange Format for Sampling, Landings, and Effort Data from Commercial Fisheries described in Jansen (2019) is used.

REFERENCE:

Jansen, T. (Ed). 2009. Definition of Standard Data-Exchange Format for Sampling, Landings, and Effort Data from Commercial Fisheries. ICES Cooperative Research Report No. 296. 43 pp.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Description of the population

No deviations from the work plan occurred regarding the population planned and sampled.

Sampling design and protocols

No deviations from the work plan occurred regarding Sampling design and protocols.

Sampling implementation

In most cases, the deviations were related to the delay in the start of the project in 2022. Sampling implementation was affected in certain sampling frames/metiers, but to varying degrees. For boat seines no sampling trip was realised during 2022, as the relevant fishery did not operate due to administrative issues.

Data capture

No deviations from the work plan occurred regarding data capture.

Data storage

No deviations from the work plan occurred regarding data storage.

Sample storage

No deviations from the work plan occurred regarding sample storage.

Data processing

No deviations from the work plan occurred regarding data processing.

MS : GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: ShoreComTripallsp
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: from when until when: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* The applied sampling scheme is a spatially, temporally, and technically stratified random sampling scheme recording all landings fractions, aiming to collect length and quantity data by species for all the species of Table 1 of the EU MAP Delegated Decision annex that are relevant for Greece, and the species of Appendix A.3 of GFCM-DCRF. The species are listed in Table 2.1 of the Greek sampling plan. Sampling is performed on-shore in selected metiers of small-scale fishery using passive gears, by scientific observers.
Description of the population
Population targeted*: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.* The Primary Sampling Unit (PSU) is the fishing trip. The Target Population is all the fishing trips conducted by all commercial vessels of the Greek small scale fishing fleet using passive gears per GSA, for the reference years. The source of data is the Official National Fleet Registry and the DCF data collection system in the reference years **Population sampled:** *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.* The population sampled in the on-shore sampling scheme is the fishing trips of the vessels of small-scale fishing fleet that use passive gears and are engaged in selected métiers. The reason for applying this sampling scheme on the aforementioned métiers, is that these are often applied by small vessels that are not suitable for on-board sampling. As a result, if only the SeaComTripallsp sampling scheme were to be applied on this part of the fleet, a significant part of it would be naturally excluded by the sample, adding bias to the collected data. The métiers included in the on-shore sampling scheme are five (5), the following: set gillnets for demersal fish (GNS_DEF_>=16_0_0), set trammel net for demersal fish (GTR_DEF_>=16_0_0), set long lines for demersal fish (LLS_DEF_0_0_0), drifting long

lines for large pelagic fish (LLD_LPF_0_0_0), pots and traps for demersal species (FPO_DEF_0_0_0).

The part of the population that is excluded from sampling is the fishing trips of the vessels engaged in métier that were not selected for sampling by the ranking system. However, it has to be stressed that total landings and effort data are also recorded for every metier that it was not selected by the ranking process.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The applied sampling scheme is spatially, technically, and temporally stratified. The spatial stratification takes into account that Greek fishing activities cover **3** GSAs: (a) Aegean Sea (GSA 22), (b) Ionian Sea (GSA 20) and (c) Cretan Sea (GSA 23). Furthermore, in each GSA the technical stratification is related to the **5** métiers sampled (the métiers of small-scale fishing fleet that use passive gears). Finally, the sampling scheme is temporally stratified, by quarter, to conform with seasonal variations of fishing activity, as well as of stock related variables.

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

The estimation of the total sampling effort as well as its temporal and spatial distribution are calculated based on a ranking system using the corresponding distribution of fishing effort, number of fishing vessels and total landings and discards between the different strata in the reference years. This process is integrated with the outcomes of the application of the methods delivered under MARE/2014/19Med&BS project (Deliverable 2.5 and 4.2) implementing the Sampling Design tool for optimization of sampling intensity and data quality checks. The methodological framework developed in WP2 of MARE/2014/19 MED&BS is implemented in R scripts built on COSTS tools and it allows the analysis of the evolution of the sampling variability with the number of samples, the assessment of the current plans in terms of over/under-sampling of the fisheries and it facilitates the proposal of an "optimal" sampling plan (in terms of number of trips and individuals to sample) disaggregated over strata (e.g. quarters and métiers).

For the selection of the sampling trips within each stratum a stratified random sample selection with replacement is applied. The species for which length are collected, are described in the table 2.1 of the Greek WP. For these species, all landing fractions are recorded by the on-shore observers.

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

 Y

The sampling design followed in in compliance with 4S principle, since it has clearly defined target population and sampling frame, clearly identified strata and clearly defined probabilistic methods for sample selection that provide samples as free as possible from selection biases.

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*
Y
The sampling design follows the annual recommendations for biological data of the Regional Co-ordination Group for the Mediterranean and Black Sea (RCG Med&BS).

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

On-shore observers use dedicated protocols for multi-taxa data collection. These protocols are appropriately designed in order to record trip (Trip ID, Vessel ID, date and time of departure and return, number of hauls, landing port etc), haul (Haul ID, type of métier applied and relevant information, depth, coordinates, haul duration, weather conditions, target species), species (species name, catch fraction, total weight, sample weight, sample number) and individual related information (Length of individuals of selected species).

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*
Y
The sampling protocol design follows the annual recommendations for biological data of the Regional Co-ordination Group for the Mediterranean and Black Sea (RCG Med&BS).

Sampling implementation

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

N

Documentation will be available till the end of 2024

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

The sampling progress is monitored and check in a monthly basis, in order to detect possible deviations from the spatial and temporal design of the applied sampling scheme. Whenever the target for sampling within a quarter and for any metier is not reached, the obligation is transferred to the next quarter

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

On shore observers use standard scales for recording sample and total weight per landed species and measuring boards for recording individual lengths.

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

GFCM, 2018. GFCM Data Collection Reference Framework (DCRF).

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*
Y
GFCM, 2018. GFCM Data Collection Reference Framework (DCRF).

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*
NA

The relevant data are stored in the FRI and HCMR local databases, that feed the National Data Base. These data bases are not accessible through a website.

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

Biological data are subject to various quality checks, using dedicated R scripts, with main purpose to detect outliers, misprinting, species misidentification etc.
https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

NA

This sampling plan does not include samples to be stored

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

NA

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*
Y
Information for the data accuracy can be found in:
https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf
This document describes the general guidelines on data quality methods applied on Greek DCF biological data, Analytical information on the methodologies used for handling biological data under the Greek DCF can be found in:
http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality Assurance of Estimation Methods.pdf

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

Y

Information for the data accuracy can be found in:

https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf

This document describes the general guidelines on data quality methods applied on Greek DCF biological data, Analytical information on the methodologies used for handling biological data under the Greek DCF can be found in:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality Assurance of Estimation Methods.pdf

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed*?

Analytical information on the methodologies used for handling biological data under the Greek DCF can be found in:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality Assurance of Estimation Methods.pdf

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*

The final datasets are subject to various quality checks, using dedicated R scripts, with main purpose to detect the structural errors in the provided datasets (such as duplicated or missing information etc.). For most purposes, the Standard Data-Exchange Format for Sampling, Landings, and Effort Data from Commercial Fisheries described in Jansen (2019) is used.

REFERENCE:

Jansen, T. (Ed). 2009. Definition of Standard Data-Exchange Format for Sampling, Landings, and Effort Data from Commercial Fisheries. ICES Cooperative Research Report No. 296. 43 pp.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Description of the population

No deviations from the work plan occurred regarding the population planned and sampled.

Sampling design and protocols

No deviations from the work plan occurred regarding Sampling design and protocols. .

Sampling implementation

In most cases, the deviations were related to the delay in the start of the project in 2022. Sampling implementation was affected in certain sampling frames/metiers, but to varying degrees.

Data capture

No deviations from the work plan occurred regarding data capture.

<u>Data storage</u>
No deviations from the work plan occurred regarding data storage.

<u>Sample storage</u>
No deviations from the work plan occurred regarding sample storage.

<u>Data processing</u>
No deviations from the work plan occurred regarding data processing.

(Sampling scheme identifier: MEDIAS)

MS : GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: MEDIAS
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea
Time period of validity: from when until when: 2022-2024

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

The objectives of the MEDIAS survey and the adopted sampling scheme as carried out in the Hellenic part of GSAs 22 and 20 are:
• Assess total pelagic fish echo abundance.
• Assess Abundance and Biomass indices estimation of the target species, anchovy (Engraulis encrasicolus) and sardine (Sardina pilchardus) by means of acoustics.
• Collect biological information for the population of the target species by means of midwater trawl hauls.
• Estimate Age and length structure of the population of the target species.
• Collect biological information for all pelagic species represented in the catch composition of the midwater trawl hauls (i.e. Length frequency distribution and Length – Weight relationships).
• Collect environmental information based on CTD sampling in predefined sampling stations.

Description of the population

Population targeted*: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.*

The MEDIAS survey targets the study of the pelagic component of the ecosystem, focusing on European anchovy (*Engraulis encrasicolus*) and European sardine (*Sardina pilchardus*) in the Greek part of GSA22 and eastern Ionian Sea (GSA20).

Population sampled: *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.*

The MEDIAS survey traditionally takes place from May to July in the Greek part of GSA22 aiming to capture the reproduction period of anchovy population and the recruitment period of sardine. The survey in GSA20 aims to capture the recruitment period of anchovy.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

No stratification is taking place

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

Sampling design and sampling protocols are in accordance to the MEDIAS handbook (http://www.medias-project.eu/medias/website/handbooks-menu.html), adjusted if needed.

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

No regional coordination among MS is taking place. The survey is coordinated by the MEDIAS Steering Committee (see followed protocol in http://www.medias-project.eu/medias/website/handbooks-menu.html), adjusted if needed.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

Sampling design can be found at the MEDIAS site

-MEDIAS map (http://www.medias-project.eu/medias/website/maps/Maps/MEDIAS-SURVEY.jpg/)

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

-MEDIAS meeting reports (http://www.medias-project.eu/medias/website/meetingrep.html)

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

MEDIAS updated handbook can be found at http://www.medias-project.eu/medias/website/handbooks-menu.html

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*

"Y" The survey is in compliance with the MEDIAS handbook and the sampling protocol described therein

Sampling implementation

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

NA

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

NA

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

Acoustic echoes are registered continuously along pre-defined transects with a Simrad 38 kHz split-beam echo sounder transducer and echograms are analyzed with Echoview scientific software in order to identify school marks that characterize anchovy and sardine in conjunction with the target strength of each species. Pelagic trawling operations with a midwater trawl net are regularly held along transects in the positions of high fish concentrations to collect

biological samples. Hydrographic parameters are recorded over a predefined grid of sampling stations by means of a Temperature-Salinity-Depth (CTD) system SBE-19 of Seabird Electronics.

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

MEDIAS handbook at http://www.medias-project.eu/medias/website/handbooks-menu.html
-MEDIAS meeting reports (http://www.medias-project.eu/medias/website/meetingrep.html)

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*
See:
-MEDIAS handbook at http://www.medias-project.eu/medias/website/handbooks-menu.html
-MEDIAS meeting reports (http://www.medias-project.eu/medias/website/meetingrep.html)

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

Acoustic data per Elementary Sampling Unit are stored in HCMR database called "Acoustics". The database is not accessible through a website. Biomass estimates and biological data information such length frequency distribution and ALKs are stored in the National Database also used for data obtained within "onboard" and "biological" sampling.

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

Echogram acoustic estimates per Elementary Sampling Unit are checked for extreme high values and fish schools that are associated with. Biological data are subjected to quality checks mainly regarding the length frequency distribution and age readings.

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the

auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

Acoustic data in raw format (according to international protocols) are stored in hard disks maintained locally due to large file size. Fish samples are stored in the freezer for length frequency distribution and age reading. Samples are analysed within the first year of sampling. Biomass estimates are stored in national database.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided
.

Acoustic data analysis is in accordance to the MEDIAS handbook (MEDIAS handbook at http://www.medias-project.eu/medias/website/handbooks-menu.html) and presented in the MEDIAS meeting reports (http://www.medias-project.eu/medias/website/meetingrep.html)

Concerning biological data obtained within the survey, references again can be found in the MEDIAS updated protocol regarding otolith readings and maturity staging and references therein. Information is providing for each survey year in the MEDIAS meeting reports (http://www.medias-project.eu/medias/website/meetingrep.html).

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*
Y

Based on the MEDIAS protocol (MEDIAS handbook at http://www.medias-project.eu/medias/website/handbooks-menu.html) and the latest MEDIAS meeting report (http://www.medias-project.eu/medias/website/meetingrep.html) the coefficient of variation of the acoustic estimates accuracy to due to survey design ability to capture target species' distribution and abundance, is estimated based on a common script for all MEDIAS members.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

The methodology used is described in the MEDIAS protocol (MEDIAS handbook at http://www.medias-project.eu/medias/website/handbooks-menu.html). Concerning biological data obtained within the survey, references can be found in the updated protocol regarding otolith readings and maturity staging.

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

Not available

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*
Acoustic profiles and acoustic estimates per Elementary Sampling Unit are checked for extreme high values and fish schools that are associated with. The final dataset is validated for quality checks mainly regarding the length frequency distribution, age readings and units of measurements

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan**.**

Description of the population
No deviations from the work plan occurred regarding the population planned and sampled.

Sampling design and protocols
No deviations from the work plan occurred regarding Sampling design and protocols.

Sampling implementation
No deviations from the work plan occurred regarding Sampling implementation

Data capture
No deviations from the work plan occurred regarding data capture..

Data storage
No deviations from the work plan occurred regarding data storage.

Sample storage
No deviations from the work plan occurred regarding sample storage.

Data processing
No deviations from the work plan occurred regarding data processing.

(Sampling scheme identifier: MEDITS)

MS : GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: MEDITS
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea

Time period of validity: from when until when: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* The primary goal of the MEDITS survey is to evaluate stocks' abundance, biomass and distribution and to monitor changes on them, to describe the demographic structure of the demersal megafauna community and to collect biological data of certain species as well as abiotic parameters (more details at: http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf
Description of the population
Population targeted*: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.* PSU: fish haul Main target species: MEDITS reference list of target species that includes 82 demersal species (fishes, crustaceans and cephalopods), 32 of them are elasmobranchs Main survey area: GSAs 20,22,23 (E. Ionian, Aegean and Cretan Seas) **Population sampled:** *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.* MEDITS reference list of target species that includes 82 demersal species, 32 of them are elasmobranchs (Annex VI of MEDITS handbook v.9, 2017) **Stratification:** *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.* Geographic stratification: 3 GSAs (20,22,23) Bathymetric stratification: 5 depth strata (10-50 m, 51-100 m, 101-200 m, 201-500 m and 501-800 m) in each of the sampled GSAs
Sampling design and protocols
Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.* Depth stratified sampling for demersal fish communities **Is the sampling design compliant with the 4S principle?:** *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

MEDITS Steering Committee is in charge of planning the Survey.
Participating EU member states are Greece, Spain, Italy, France, Cyprus, Croatia, Slovenia and Malta. Each MS is responsible for the activities conducted on its national part of the international survey. There is no regional or multi-lateral agreement for this survey

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*
Y

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators*
Y
.

Sampling implementation

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

NA

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

Non applicable

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

A bottom trawl (GOC73) designed especially for experimental fishing, the Otter Boards type MorgereWH S, the sensors to control the trawl geometry (vertical and horizontal openings, contact with the bottom), the CTD for abiotic parameters, several scales, measuring boards and lab equipment
(see relevant section of MEDITS Handbook http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

http://www.sibm.it/MEDITS 2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

Y, RoME software
https://www.sibm.it/MEDITS%202011/new/RoME_April_2019/RoME%201.4%20User%20Manual%20-%202019.pdf

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Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

The relevant data are stored in the FRI and HCMR local databases, that feed the National Data Base.

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*
NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

The ROME software

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

The otoliths are stored within dedicated storage units in FRI and HCMR facilities, under the institutes' responsibility. The otoliths are stored indefinitely. *Merluccius merluccius* stomach samples are kept frozen until their analysis.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

- Follesa, M.C., Carbonara, P., eds. 2019. Atlas of the maturity stages of Mediterranean fishery resources. Studies and Reviews n. 99. Rome,FAO. 268 pp.
- Carbonara, P., Follesa, M.C., eds. 2019. Handbook on fish age determination: a Mediterranean experience. Studies and Reviews. No. 98. Rome, FAO. 2019. 192 pp.
- Amundsen P., Sánchez-Hernández J. (2019). Feeding studies take guts – critical review and recommendations of methods for stomach contents analysis in fish. Journal of Fish Biology, 95: 1364–1373.
- Hyslop E.J. (1980). Stomach contents analysis- a review of methods and their application. Journal of Fish Biology, 17: 411-429

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.*

Not applicable

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox*

 Not applicable

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: *How are datasets validated (quality checked) before providing to end-user?*

By means of the RoME software routine

https://www.sibm.it/MEDITS%202011/new/RoME_April_2019/RoME%201.4%20User%20Manual%20-%202019.pdf

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan**.**

Description of the population
No deviations from the work plan occurred regarding the population planned and sampled in GSAs 20, 22, 23

Sampling design and protocols
No deviations from the work plan occurred regarding Sampling design and protocols in GSAs 20, 22, 23

Sampling implementation
No deviation in GSAs 20 and 23. In GSA 22 there was a small deviation in the temporal coverage of the survey (work plan time period: June-September). One of the three chartered bottom trawlers (the one in N. Aegean) experienced engine failure during the survey and the engine had to be replaced. Therefore 26 hauls (14%) were realized in the first fortnight of October 2022.

Data capture
No deviations from the work plan occurred regarding data capture in GSAs 20, 22, 23.

Data storage
No deviations from the work plan occurred regarding data storage in GSAs 20, 22, 23.

Sample storage
No deviations from the work plan occurred regarding sample storage in GSAs 20, 22, 23.

Data processing
No deviations from the work plan occurred regarding data processing in GSAs 20, 22, 23.

(Sampling scheme identifier: MEDITS (stomach sampling))

MS : GRC	
Region: Mediterranean and Black Sea	
Sampling scheme identifier: MEDITS	
Sampling scheme type: Research survey at sea	
Observation type: SciObsAtSea	
Time period of validity: from when until when: 2022-2024	

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

Sampling scheme aiming at collecting *Merluccius merluccius* stomach samples during the MEDITS scientific survey for stomach contents analysis, in the framework of the assessment of the impact of fisheries on marine biological resources and ecosystems. The sampling scheme covers GSA 20 (Eastern Ionian Sea) & GSA 22 (Aegean Sea).

Description of the population

Population targeted*: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.*

Merluccius merluccius populations in GSA 20 (Eastern Ionian Sea) & GSA 22 (Aegean Sea) will be targeted for stomach contents analysis, according to Recommendation #13 of the RCG Med&BS Annual Meeting in 2021. European hake was recommended as a target species for stomach contents analysis for the Mediterranean GSAs by the MARE/2014/19 Med&BS project (RCG-Med&BS 2016), the WKSTCON workshop (RCG-Med&BS 2018), and the MARE/2016/22 STREAM project (RCG-Med&BS 2019).

European hake ranks among the commercially most important demersal species in the Greek seas, with 4323.5 t total catches by all types of fishing gear in 2020 (HSA 2021). *Merluccius merluccius* is among the species for which stocks are being assessed in Aegean and Ionian waters (JRC 2020).

REFERENCES:
HSA (2021). Hellenic Statistical Authority: Results of the Sea Fishery Survey by motor-propelled vessels for the year 2020. https://bit.ly/3BcD1YQ

JRC (2020). Scientific, Technical and Economic Committee for Fisheries (STECF) Stock Assessments in the Mediterranean Sea – Adriatic, Ionian and Aegean Seas (STECF-20-15). EUR 28359 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-27168-0, doi:10.2760/877405, JRC122994.

RCG-Med&BS (2016). Strengthening regional cooperation in the area of fisheries data collection in the Mediterranean and Black Sea, D0.2. Final Report: Deliverable 3.3. Protocols and guidelines for sampling, processing and analysing the stomach contents. Agreement number MARE/2014/19 - SI2.705484.

RCG-Med&BS (2018). Workshop on sampling, processing and analysing the stomach contents (WKSTCON). WKSTCON Report 2018. 24-27 April 2018, Palma de Mallorca, Spain.

RCG-Med&BS (2019). Strengthening regional cooperation in the area of fisheries data collection in the Mediterranean and Black Sea (STREAM), D0.3 Final Report: Deliverable D. 4.1. Updated protocols and guidelines for collection, processing and analysis of stomach contents. Agreement number MARE/2016/22 – SI2.770115.

Population sampled: *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.*

Merluccius merluccius populations in GSA 20 (Eastern Ionian Sea) & GSA 22 (Aegean Sea) will be sampled.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The European hake is an eurybathic species, usually found between 70 and 370 m depth, but may also occur within a wider depth range, from inshore waters to 1000 m (Whitehead et al. 1986).

REFERENCES:

Whitehead P.J.P., Bauchot M.-L., Hureau J.-C., Nielsen J., Tortonese E. (1986). Fishes of the North-Eastern Atlantic and the Mediterranean. Volumes I – III. UNESCO.

Sampling design and protocols

Sampling design description: *Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.*

In line with Recommendation #13 of the RCG Med&BS Annual Meeting in 2021, GRC will align the sampling methodology for the *Merluccius merluccius* stomach contents analysis according to the recommendations of the MARE/2016/22 STREAM project (RCG-Med&BS 2019): The samples will be collected once a year during only the annual MEDITS bottom trawl scientific survey (NOT during biological sampling of commercial fisheries). 20 to 40 full stomachs will be sampled for every life stage, i.e., i) juveniles (<20 cm TL); ii) sub-adults (20-35 cm TL) and iii) adults (>35 cm TL). The areas covered during 2022 – 2024 by GRC will be GSA 20 (Eastern Ionian Sea) & GSA 22 (Aegean Sea). GSA 22 will be sampled by FRI, and GSA 20 by HCMR.

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*

NA

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*

Sampling design and protocols were NOT developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference*

(author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

In line with Recommendation #13 of the RCG Med&BS Annual Meeting in 2021, GRC will carry out the *Merluccius merluccius* stomach contents analysis according to the recommendations of the MARE/2016/22 STREAM project (RCG-Med&BS 2019), as detailed above.

Link to the documentation:

 https://inale.gr/wp-content/uploads/2021/10/Stomach_contents_STREAM_Del.4.1.pdf

Compliance with international recommendations: *Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

In line with Recommendation #13 of the RCG Med&BS Annual Meeting in 2021, GRC will carry out the *Merluccius merluccius* stomach contents analysis according to the recommendations of the MARE/2016/22 STREAM project (RCG-Med&BS 2019), as detailed above.

Link to sampling protocol documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.*

https://inale.gr/wp-content/uploads/2021/10/Stomach_contents_STREAM_Del.4.1.pdf

Compliance with international recommendations: *Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.*

Y

In line with Recommendation #13 of the RCG Med&BS Annual Meeting in 2021, GRC will carry out the *Merluccius merluccius* stomach contents analysis according to the recommendations of the MARE/2016/22 STREAM project (RCG-Med&BS 2019), as detailed above.

Sampling implementation

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

NA

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

Sampling will be carried out during the annual MEDITS scientific survey only.

Data capture

Means of data capture: *short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...*

TL of the individuals will be measured on board to the nearest mm with a measuring board. Prey items will be weighted with a scale with a precision of 0.001 g. Fish prey otolith-based identification will be carried out with the automatic classification system of otoliths available at the AFORO web site at http://aforo.cmima.csic.es/index.jsp.

Data capture documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.*

The scoreboard for stomach content sampling proposed by the MARE/2016/22 STREAM project (RCG-Med&BS 2019) will be used for data capture.

Link to the documentation:
https://inale.gr/wp-content/uploads/2021/10/Stomach_contents_STREAM_Del.4.1.pdf

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

N

Documentation on data validation will be available in 2024 at the earliest.

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

The data will be stored at the FRI & HCMR local databases, which are maintained at the Fisheries Research Institute, and the Hellenic Center for Marine Rersearch, respectively.

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

NA

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

Documentation on data validation will be available in 2024 at the earliest.

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

Merluccius merluccius stomach samples will be kept frozen until their analysis. A minimum of 60 full stomachs per GSA and per year will be stored.

Link to the documentation:

https://inale.gr/wp-content/uploads/2021/10/Stomach_contents_STREAM_Del.4.1.pdf

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

The processing of samples will be carried out according to the sampling protocol described in section 3.2 of MARE/2016/22 STREAM project (RCG-Med&BS 2019) and only the gravimetric method (Hyslop 1980; Amundsen & Sánchez-Hernández 2019) will be applied.

Link to the documentation

https://inale.gr/wp-content/uploads/2021/10/Stomach_contents_STREAM_Del.4.1.pdf

REFERENCES
Amundsen P., Sánchez-Hernández J. (2019). Feeding studies take guts – critical review and recommendations of methods for stomach contents analysis in fish. Journal of Fish Biology, 95: 1364–1373.
Hyslop E.J. (1980). Stomach contents analysis- a review of methods and their application. Journal of Fish Biology, 17: 411-429.

Data processing

Evaluation of data accuracy (bias and precision): *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can*

be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

To evaluate whether the number of fish stomachs examined was adequate for a valid description of the diet of the species, cumulative prey curves (Ferry and Cailliet 1996; Link & Almeida 2000; Morato et al. 2003; Tiralongo et al. 2018) will be computed.

REFERENCES

Ferry LA, Cailliet GM (1996). Sample size and data analysis: are we characterizing and comparing diet properly? In: Shearer KD, MacKinlay DD (eds) (1996) GUTSHOP '96. Feeding Ecology and Nutrition in Fish. International Congress on the Biology of Fishes. San Francisco State University, USA, July 14-18, 1996. American Fisheries Society, USA, pp. 71–80.

Link J.S., Almeida F.P. (2000). An overview and history of the food web dynamics program of the Northeast Fisheries Science Center, Woods Hole, Massachusetts. NOAA Technical Memorandum NMFS-NE-159, 60 pp.

Morato T., Sola E., Gros M.P., Menezes G. (2003). Diets of thornback ray (*Raja clavata*) and tope shark (*Galeorhinus galeus*) in the bottom longline fishery of the Azores, north-eastern Atlantic. Fishery Bulletin 101: 590-602.

Tiralongo F, Messina G, Cazzolla Gatti R, Tibullo D, Lombardo BM (2018). Some biological aspects of juveniles of the rough ray, *Raja radula* Delaroche, 1809 in Eastern Sicily (central Mediterranean Sea). Journal of Sea Research 142: 174–179.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

N

Documentation on data validation will be available in 2024 at the earliest.

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

A publication digital object identifier (DOI) has not been created yet for the quality document associated to the stomach contents dataset.

Documentation on data validation will be available in 2024 at the earliest.

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*

Documentation on data validation will be available in 2024 at the earliest.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan**.**

Description of the population
No deviations from the work plan occurred regarding the population planned and sampled in GSAs 20 and 22

Sampling design and protocols
No deviations from the work plan occurred regarding Sampling design and protocols in GSAs 20 and 22

Sampling implementation
No deviations from the work plan occurred in GSA 20 regarding sampling implementation
In GSA 22 a total of 237 stomach samples were collected during MEDITS 2022. The full stomachs collected were 145, which were distributed to the life stage/body size classes as follows: i) 44 stomachs of juveniles (<20 cm TL); ii) 79 stomachs of sub-adults (20-35 cm TL) and iii) 22 stomachs of adults (>35 cm TL). More than the provisioned number of stomachs (work plan: 120) were collected (237) to further improve data reliability and to ensure that enough full stomachs (work plan: at least 20) would be collected for the adults (>35 cm TL) class.
Concerning the temporal coverage of the stomachs sampling, 108 stomachs were collected in the survey carried out in June-July 2022 (work plan time period: June-September). On July 14, 2022 the chartered bottom trawler experienced engine failure and the engine had to be replaced. It became possible to resume and complete MEDITS field work in October 2022 when the rest of the stomachs (129) were collected.

Data capture
No deviations from the work plan occurred regarding data capture in GSAs 20 and 22.

Data storage
No deviations from the work plan occurred regarding data storage in GSAs 20 and 22.
Sample storage
No deviations from the work plan occurred regarding sample storage in GSAs 20 and 22.
Data processing
No deviations from the work plan occurred regarding data processing in GSAs 20 and 22.
The analysis of cumulative prey curves revealed that the number of full fish stomachs examined was adequate for a valid description of the diet of the species.

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.

Provide information under each point in all sections. Do not delete any text from the template.

(Sampling scheme identifier: Fishing activity PSS)

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.   *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.*   *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): complementary data collection of fishing activity
Sampling scheme: PSS
Variables: • **Days at sea**   • **Hours fished**   • **Fishing days**   • **kW * Days at sea**   • **GT * Days at sea**   • **kW * Fishing Days**   • **GT * Fishing days**   • **Number of trips**   • **Number of fishing operations**   • **Number of nets(m) * soak time (days)**   • **Number of nets / Length**   • **Number of hooks, Number of lines**   • **Numbers of pots, traps**   • **Number of FADs/buoys**   • **Number of support vessels**   • **Value of landings total and per commercial species**   • **Live Weight of landings total and per species**   • **Average prices per species**
Supra region(s): Mediterranean Sea and Black Sea

Survey planning

Provide a short description of the population the sampling scheme applies to; e.g. 'less active vessels using passive gears'.

The sampling scheme applies to **the total vessel population**. The sample unit is the vessel and it is selected from the Greek National Fleet Register that corresponds to December 31th of the reference year. Moreover, the sample unit and, therefore, the sampling frame are common for the economic and effort variables following the Commission Decision 2010/93/EU (European Commission, 2010 - section A.1.1).

In the case of segments with

- vessels longer than 12 meters,
- vessels acquire licenses for specific fisheries (Bluefin tuna and swordfish) and
- Beach seines,

the survey described here is complementary to the control regulation. In the rest segments, this survey can be considered as the main, given the fact that the control regulation is not yet implemented properly to all vessels and therefore it cannot provide reliable information for this module.

Survey design and strategy
List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc.
Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc.

For the complementary data collection, a sampling scheme of stratified random sampling is chosen. The sample unit is the vessel and it is selected randomly from each stratum as is described below. The stratified random sampling of the Greek fishing fleet is considered the most proper sampling technique due to the high heterogeneity of the population.

The data collection is based on the probability sample survey using structured questionnaires, filled out by face-to-face interviews with fishermen. The interviewers are fisheries scientists who receive the appropriate yearly training for the correct completion of the questionnaires.

Target and Frame Population

The target population is the total number of registered vessels in the Greek fishing fleet. The fishing gears are divided into active, passive and polyvalent gears (utilization of both active and passive gears), as Table 1 presents. Table 1 also presents the métiers (fishing activity level 6) that correspond to each fishing gear. In addition, table 1 shows the total number of fishing vessels by main fishing gear (and métier) groups and length class, features that determine the segments of the fishing fleet. Finally, it should be noted that the number of inactive vessels is not taken into account *a priori* as no information is available. Thus, the target population is equal to the frame population. Table 2 and 3 present the Greek fishing fleet's clustering scheme and the final number of vessels per (clustered) segments, respectively.

Table 1. The segmentation of the Greek fleet according to the European Union Multi-Annual Program (EU-MAP) and the national fleet register was retrieved from EU on September 29th 2021

	Gears	métiers (Activ. level 6)	Length Class				
			VL0006	VL0612	VL1218	VL1824	VL2440
Active Gears	Beam trawlers (**TBB**)	NA in Greece	-	-	-	-	-
	Demersal trawlers and/or demersal seiners (**DTS**)	SB-SV_DEF_0_0_0 * OTB_DEF_>=40_0_0*	3	174	38	101	144
	Pelagic trawlers (**TM**)	- NA in Greece	-	-	-	-	-
	Purse seiners (**PS**)	PS_SPF_>=14_0_0	-	2	81	130	29
	Dredgers (**DRB/DRH**) **	DRB_MOL_0_0_0	11	24	-	-	-
	Vessels using other active gears (**MGO**)	NA in Greece	-	-	-	-	-
	Vessels using Polyvalent 'active' gears only (**MGP**)	NA in Greece	-	-	-	-	-
Passive Gears	Vessels using hooks (**HOK**)	LHP-LHM_FIF_0_0_0 LLD_LPF_0_0_0 LLS_DEF_0_0_0 LTL_LPF_0_0_0	1759	2688	121	8	-
	Drift and/or fixed netters (**DFN**)	GNS_DEF_>=16_0_0 GTR_DEF_>=16_0_0 GTN_DEF_>16_0_0 GNC***	3194	5541	177	2	-
	Vessels using Pots and/or traps (**FPO**)	FPO_DEF_0_0_0	57	269	9	1	-
	Vessels using other Passive gears (**PGO**)	NA in Greece	-	-	-	-	-
	Vessels using Polyvalent 'passive' gears only (**PGP**)	NA in Greece	-	-	-	-	-
Vessels using active and passive gears (PMP)		NA in Greece	-	-	-	-	-

* SB-SV_DEF_0_0_0 corresponds to the length classes: VL0612 and VL1218, while OTB_DEF_>=40_0_0 corresponds to the length classes: VL1824 and VL244

** As far the DRB gear is concerned, General Directorate of Fisheries is in the process of changing the gear type from DRB to DRH as the DRB gear does not match the fishing technique which is actually used, which matches the DRH gear. The DRB gear will remain only for vessels that target sponges, and are not allowed to target any other stock.

*** There are only four vessels in the Greek National Fleet Register that report this gear as their main gear. For this reason, this metier is considered as not significant and is incorporated in the GTR_DEF_>=16_0_0, for reasons of similarity.

Table 2: The clustering scheme of Greek fleet segments (based on the Greek National Fleet Register retrieved from EU on September 29th 2021).

Gear	Merged segment		Clustered segment		No of vessels after clustering
	Length Class	No. of Vessels	Length Class	No. of Vessels	
DFN	VL1824	2	VL1218	177	**179** (98.9% DFNVL1218)
DTS	VL0006	3	VL0612	174	**177** (98.3% DTS0612)
FPO	VL1218 VL1824	9 1	VL0612	269	**279** (96.4% FPOVL0612)
HOK	VL1824	8	VL1218	121	**129** (93.8% HOKVL1218)
PS	VL0612	2	VL1218	81	**83** (97.6% PSVL1218)

Table 3: The total number of vessels of the Greek fleet after the clustering of segments (based on the Greek National Fleet Register retrieved from the EU on September 29th 2021).

Gear	VL0006	VL0612	VL1218	VL1824	VL2440	Total
DFN	3194	5541	179	-	-	**8914**
DRH	11	24	-	-	-	**35**
DTS		177	33	106	144	**460**
FPO	57	279	-	-	-	**336**
HOK	1759	2688	129	-	-	**4576**
PS	-	-	83	130	29	**242**

Stratification

The sampling design is based on the stratification of the Greek fishing fleet based on métiers (fishing activity level 6) and vessel length classes, as indicated in Table 4.

Table 4. Strata developed and connection with metier and fleet segments

Strata	Metier	Fleet Segments
SB_0612	SB-SV_DEF_0_0_0	Demersal trawlers and/or demersal seiners (**DTS.**) VL0612
SB_1218		Demersal trawlers and/or demersal seiners (**DTS.**) VL1218
OTB_1824	OTB_DEF_>=40_0_0	Demersal trawlers and/or demersal seiners (**DTS.**) VL1824
OTB_2440		Demersal trawlers and/or demersal seiners (**DTS.**) VL2440
PS_1218		Purse seiners (**PS**) VL1218
PS_1824	PS_SPF_>=14_0_0	Purse seiners (**PS**) VL1824
PS_2440		Purse seiners (**PS**) VL2440
DRH_0006	DRH_MOL_0_0_0	Dredgers (**DRB/DRH**) VL006*
DRH_0612		Dredgers (**DRB/DRH**) VL0612*
LHP-LHM_0006	LHP-LHM_FIF_0_0_0	
LLD_0006	LLD_LPF_0_0_0	Vessels using hooks (**HOK**) VL0006
LLS_0006	LLS_DEF_0_0_0	
LTL_0006	LTL_LPF_60_0_0	
LHP-LHM_0612	LHP-LHM_FIF_0_0_0	
LLD_0612	LLD_LPF_0_0_0	Vessels using hooks (**HOK**) VL0612
LLS_0612	LLS_DEF_0_0_0	
LTL_0612	LTL_LPF_0_0_0	
LHP-LHM_1218	LHP-LHM_FIF_0_0_0	
LLD_1218	LLD_LPF_0_0_0	Vessels using hooks (**HOK**) VL1218
LLS_1218	LLS_DEF_0_0_0	
LTL_1218	LTL_LPF_0_0_0	
GNS_0006	GNS_DEF_>=16_0_0	
GTR_0006	GTR_DEF_>=16_0_0	Drift and/or fixed netters (**DFN**) VL0006
GTN_0006	GTN_DEF_>16_0_0	
GNS_0612	GNS_DEF_>=16_0_0	
GTR_0612	GTR_DEF_>=16_0_0	Drift and/or fixed netters (**DFN**) VL0612
GTN_0612	GTN_DEF_>16_0_0	
GNS_1218	GNS_DEF_>=16_0_0	
GTR_1218	GTR_DEF_>=16_0_0	Drift and/or fixed netters (**DFN**) VL1218
GTN_1218	GTN_DEF_>16_0_0	
FPO_0006	FPO_DEF_0_0_0	Vessels using Pots and/or traps (**FPO**) VL0006
FPO_0612		Vessels using Pots and/or traps (**FPO**) VL0612

*As far the DRB gear is concerned, General Directorate of Fisheries is in the process of changing the gear type from DRB to DRH as the DRB gear does not match the fishing technique which is actually used, which matches the DRH gear. The DRB gear will remain only for vessels that target sponges, and are not allowed to target any other stock.

Furthermore, 12 major (geographical) areas are used for a proportional (geographical) allocation of the sample (for proportional allocation, see also Deliverable 2.1 from

MARE/2016/22 SECFISH study). These areas are the following (see also Figure 1): Argosaronikos (ARGSAR), Chios - Mytilene (CH-MIT), Central Ionion (C-ION), Crete (CRETE), Cyclades (CYCL), Dodecanese (DODEC), Evia (EVIA), North Ionion (N-ION), South Ionion (S-ION), Thermaikos Gulf (THERM), Thracian Sea-Limnos (THR-LIM) and Volos-Sporades (VOL-SPOR). The FRI is responsible for the coordination and collection of questionnaires in the regions: Chios - Mytilene, Thermaikos Gulf, Thracian Sea-Limnos and Volos-Sporades. The HCMR is responsible for the remaining areas.

Figure 1. the 12 Greek Major Areas

Describe how the sample sizes were determined.
Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.

The sample size (n) per stratum is estimated as (Dattalo, 2008; Moura, 2016):

$$n = \frac{n_0 \cdot N}{n_0 + (N - 1)} \qquad (1)$$

where N is the population size of each métier and

$$n_0 = \frac{z^2 \cdot s^2}{e^2 \cdot \bar{x}} \qquad (2)$$

where s is the standard deviation και $\bar{x}$ is the average of the <u>auxiliary variable</u> selected as the one that can better represent the stratum variation. According to Deliverable 2.1 from MARE/2016/22 SECFISH study, auxiliary variables can be utilised for efficient sampling design. In this study, the variable "*days at sea*" is selected as an auxiliary variable, as, according to experts' knowledge, effort is one of the most important sources of variation among variables. The level of significance (z) and the margin of error (e) are selected based on the importance of each stratum, taking into consideration effort and landings data, were available, as well as the number of vessels and expert knowledge. Four different groups of strata, that represent four different level of importance (Very Important, Important, Less Important, No important), have been considered using a different combination of values for e and z (for more information see Table 4.2 of the Methodology Report for Fleet Socio Economic Variables, v.4, available at:

The sample size of each stratum, as it was calculated by equation 2, is adjusted according to equation 3 when the population size of a métier is very small and the sample size is relatively large (n/N>0.05) (see e.g., Thomson, 2002).

$$n_{adj} = \frac{n}{1 + n/N} \qquad (3)$$

As mentioned earlier, after the determination of the sample size of the strata, the number of vessels in the sample per major area is determined using the method of proportional allocation (Eurostat, 2008):

$$n_g = \frac{n \cdot N_g}{N} \qquad (4)$$

where n is the sample size per stratum, as it was calculated by equation 3, N_g is the sum of vessels of the major area per stratum and N is the population size of each stratum. Using the proportional allocation, the proportions are respected and, consequently, the share of a geographic area population to the total population will be similar to the share of this stratum to the sample size. Decimal values of sample size are rounded up to the nearest integer. Following this procedure for the vessels included in the Greek National Fleet Register that retrieved from the EU on September 29th 2021, the total sample size for the reference year 2021 is set to 761 vessels (for more information, see Table 4.3 of the Methodology Report for Fleet Socio Economic Variables, v.4, available at https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf).

In conclusion, the determination of sample size and the sample geographical allocation is based on the number of vessels of specific métiers and their importance, the vessel length class and the variability of the strata, by taking into account a representative auxiliary variable (days at sea) and the 12 major geographic areas. Then, the sample size per fleet segment is estimated by merging all the strata that included in each segment (e.g., the sample size in the segment DFN_0006 is the sum of the sample size of the following strata: GTR_0006; GNS_0006 and GTN_0006)

For more information on the planned sample size and sample rate per segment, see Tables 4.5 and 4.6 of the Methodology Report for Fleet Socio Economic Variables, v.4, respectively.

Estimation design

Describe method of calculating population estimate from sample.
Describe method of calculating derived data: e.g. imputed values.
Describe treatment of nonresponse.

The Horvitz-Thompson (HT) estimator (Horvitz and Thompson, 1952) is used to allow correct generalization of the sample statistics to the population parameters per fleet segment:

$$\hat{Y} = \sum_{i=1}^{n} y_i \times \pi_i^{-1}$$

where $\pi_i = n_{act} / N_{act}$ is the inclusion probability for each stratum, n_{act} the number of active vessels in sample per stratum and N_{act} is the number of active vessels in population per stratum.

Using the above formula, the number of inactive vessels of the population per stratum is also estimated, before the estimation of other variables. The estimation is done for the stratums less than 12 meters in length, except for the stratums using the gears SB, LLD and LHM, where inactivity can be based on ERS information.

For the part of the fleet that no VMS data are available (vessels < 10m), effort related variables (Days at sea, Hours fished, Fishing days, kW * Days at sea, GT * Days at sea, kW * Fishing Days, GT * Fishing days, Number of trips, Number of fishing operations, Number of nets(m) * soak time (days), Number of nets / Length, Number of hooks, Number of lines, Numbers of pots, traps) are calculated per month, fishing gear and GSA by raising to the total active fishing vessels population. Measures of spread (Standard deviation, Coefficient of Variation etc) are also calculated based on the methods described by Cochran and William (1977). For vessels > 10m, effort is estimated based on the VMS data.

For landings related variables (Value of landings total and per commercial species, Live Weight of landings total and per species, Average prices per species), ratio estimators (Cochran and William 1977) by using effort (fishing days) as auxiliary variable are used.

Analytical information on the methodologies used for calculating total effort and landings under the Greek DCF can be found in:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Quality Assurance of Estimation Methods.pdf

In order to address the non-response of the sampling unit (vessel), a complementary sample is selected. The complementary sample, as well as the main sample, is drawn randomly. The selection order of the complementary sample is determined in advance to avoid the collection of convenience sample. This action results in the complete non-response rate (CNR) being zero. Also, the partial non-response (PNR) rate of the collected variables is small due to the appropriate training of correspondents and the ability to resolve any questions in close cooperation with the F.R.I. research team.

Error checks

Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc.

The local databases are appropriately designed to prevent and detect possible errors during the data registration process. Specific treatments are integrated in order to prevent misreporting of data, to detect duplicate entries and to detect unrealistic values on specific fields.

-All the fields in each database are masked, preventing the entry of erroneous data types or

preventing blanks.

-Databases have integrated validators with automatic warning alert when a duplicate entry is registered.

-Databases have integrated validators with automatic warning alert when a registered species length or individual weight is not within the allowed species-specific ranges.

Additional data quality checks and verification procedures for the different stages of the sampling scheme, including the data quality checks for data capture and data validation, are applied using appropriately designed scripts within R programming environment (scripts are available at request). These scripts integrate the guidelines

and the tools developed in the MARE/2016/22 – SI2.770115 "Strengthening Regional cooperation in the Area of fisheries biological data collection in the Mediterranean and Black Sea (STREAM)".

Data storage and documentation
Describe how the data is stored. *Provide link to webpage where additional methodological documentation can be found, if any.* The relevant data are stored in the FRI and HCMR local databases and feed the National Database
Revision
Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc. Methodology is updated annually, as the fleet registry is very dynamic and may change drastically in several segments (esp. smaller ones). Moreover, updates also follow recommendations by relevant RCGs and WGs.
Confidentiality
Are procedures for confidential data handling in place and documented?   **YES** *Are protocols to enforce confidentiality between DCF partners in place and documented?*   **YES** *Are protocols to enforce confidentiality with external users in place and documented?*   **YES** *Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.* No issues, as far as confidentially and anonymity are kept.

AR comment: Indicate any deviations. Do not change the text already adopted in the work

plan.

Survey planning: No deviations exist
Survey design and strategy: Deviations only refer to the updated population, as the one reported in the WP was retrieved from Union Fishing Fleet Registry on September 29th 2021
Estimation design: No deviations exist. MS following the STECF comment on 2021 AR updated the quality report on the methodologies used for calculating total effort and landings

under the Greek DCF in order to include the results of the validation of the>12 m part of the fleet. The updated version is available on the following link:

https://inale.gr/wp-content/uploads/2023/06/Est.-Methods_WG_quality_assurance_2023.pdf

Error checks: No deviations exist
Data storage and documentation: No deviations exist
Revision: No deviations exist
Confidentiality: No deviations exist

(Sampling scheme identifier:Fisheries_C)

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.   *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.*   *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fisheries
Sampling scheme: C
Variables: **Gross value of landings (for segments >12m)**   **Number of vessels**   **Number of fishing enterprises/units**   **Subsidies on investments**
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
Provide a short description of the population the sampling scheme applies to; e.g. 'less active vessels using passive gears'.
The sampling scheme applies to **the total vessel population**. The sample unit is the vessel and it is selected from the Greek National Fleet Register that corresponds to December 31th of the reference year.
Survey design and strategy

The survey utilise census data derived from the control regulation. For the variable "subsidies on investment", there is also census data, but only for the subsidies provided by the Greek Fisheries and Maritime Operational Programme. Other possible sources of subsidies on investments are not covered.

Target and Frame Population

See Annex 1.2. for PSS on Fisheries Economic and Social variables on fisheries

Estimation design

NA

There are no nonresponse cases or other cases where imputation methods are useful.

Error checks

There are no need for specific error checks. However, in the case of value of landings, PSS survey is also implemented for validation purposes.

Data storage and documentation

The survey files including case information are created using a specific layout. The survey data can be unequivocally mapped to the internationally required fields, codes and formats if asked. Deviations from the prescribed record format must be reconciled before the data can be integrated for further processing.

All data collected are imported into a database, following specifications in the corresponding operational manuals and national record layouts. All data are verified for structural consistency within and across sources and for agreement with the defined formats and record layouts. It has to be assured that sample design and disposition data are recorded for every case. All adaptations are thoroughly tested prior to the production use of the data integration software.

Data are imported on a regular and incremental basis as the survey progresses. Adaptations to the context are reflected in the record layout before data are imported, based on the corresponding documentation. The verification of the database includes the following: 1) a unique ID check, 2) a valid

value check for nominal/ordinal variables, 3) a valid range check for continuous variables and 4) cross-table consistency checks.

Data delivery is made through secure channels (i.e. the project's SharePoint site or a secured FTP connection), in a folder to which only specific users have access. All data available on web services are accessible only through encrypted connections (HTTPS/SSL) and access control mechanisms. Each user has only a limited set of user rights

Provide link to webpage where additional methodological documentation can be found, if any.

Methodology report v.4 (available at:
https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf).

Revision

Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

The methodology is updated annually, as the fleet registry is dynamic and may change drastically in several segments (especially smaller ones). Moreover, updates also follow recommendations by RCG ECON and the relevant WGs.

Confidentiality

Are procedures for confidential data handling in place and documented?
Are protocols to enforce confidentiality between DCF partners in place and documented?
Are protocols to enforce confidentiality with external users in place and documented?
Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No issues, as far as confidentially and anonymity are kept.

For more details see, Ch. 9 and 10 of the Methodology reports, v.4, available at:
https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf

AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.

Survey planning: No deviations exist

Survey design and strategy: No deviations exist

Estimation design: No deviations exist

Error checks: No deviations exist

Data storage and documentation: No deviations exist

(Sampling scheme identifier:Fisheries_IND)

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fisheries
Sampling scheme: IND
Variables: Consumption of fixed capital and Value of physical capital
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
Provide a short description of the population the sampling scheme applies to; e.g. '*less active vessels using passive gears*'. For the estimation of the above variables the PIM methodology is applied. This methodology demands a combination of sources. More specifically, a census survey to identify the number and the age of the vessels in the segment and a probability sample survey to get a value per capacity unit (in our case LOA). As far as the probability sampling survey is concerned, the sampling scheme applies to **the total vessel population**. The sample unit is the vessel, and it is selected from the Greek National Fleet Register that corresponds to December 31st of the reference year. Moreover, the sample unit and, therefore, the sampling frame are com for the economic and effort variables following the Commission Decision 2010/93/E.U. (European Commission, 2010 - section A.1.1).
Survey design and strategy *List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc.* *Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc.* A sampling scheme of stratified random sampling is chosen for the probability sample survey. The sample unit is the vessel and it is selected randomly from each stratum as is described

below. The stratified random sampling of the Greek fishing fleet is considered the most proper sampling technique due to the high heterogeneity of the population.

The data collection is based on the probability sample survey using structured questionnaires, filled out by face-to-face interviews with fishermen. The interviewers are fisheries scientists who receive the appropriate yearly training for the correct completion of the questionnaires.

Describe how the sample sizes were determined
Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.

See Annex 1.2. for Probability Sample Survey on economic and social variables for fisheries

Estimation design

Describe method of calculating population estimate from sample.

The economic variables: *Consumption of fixed capital* and *Value of physical capital* are estimated using data from both the probability sample survey (replacement value) and the NFR (mean LOA and number of vessels per fleet segment), as is suggested by Perpetual Inventory Methodology (PIM) (European Commission, 2006). More specifically, the "degressive" depreciation function is used for the variable *Consumption of fixed capital* and the capital values are determined assuming that the engine is renovated every 10 years, electronics and other equipment every 5 and 7 years respectively, while the hull is never renovated. The share of each asset item in the total vessel price is:

- o Hull – 60%
- o Engine – 20%
- o Electronics – 10%
- o Other equipment – 10%

For the variable *Value of the physical capital*, the unit price is determined by direct survey. The selling prices of second-hand vessels and their insurance costs are also considered to evaluate/validate the results of the survey. For more information about PIM method, see Report of WS on Capital Value estimation (available at:https://datacollection.jrc.ec.europa.eu/documents/10213/891027/2019_Workshop_PGECON_Capital+value+estimations.pdf/b1d6ee1c-da5a-42c3-8d3f-c9ad73b6f64b?version=1.1&download=true

Describe method of calculating derived data: e.g. imputed values.
Describe treatment of nonresponse.

Regarded the data gathered from census survey, there are no nonresponse cases or other cases where imputation methods are useful. Therefore, this part is only relevant for the probability sample survey, and it is described in the Annex 1.2. for Probability Sample Survey on economic and social variables on fisheries

Error checks

Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc.

Regarded the data gathered from census survey, there are no errors identified. Therefore, this part is only relevant for the probability sample survey, and it is described in the Annex 1.2. for Probability Sample Survey on economic and social variables for fisheries

Data storage and documentation

Describe how the data is stored.

The survey files including case information are created using a specific layout. The survey data can be unequivocally mapped to the internationally required fields, codes and formats if asked. Deviations from the prescribed record format must be reconciled before the data can be integrated for further processing.

All data collected are imported into a database, following specifications in the corresponding operational manuals and national record layouts. All data are verified for structural consistency within and across sources and for agreement with the defined formats and record layouts. It has to be assured that sample design and disposition data are recorded for every case. All adaptations are thoroughly tested prior to the production use of the data integration software.

Data are imported on a regular and incremental basis as the survey progresses. Adaptations to the context are reflected in the record layout before data are imported, based on the corresponding documentation. The verification of the database includes the following: 1) a unique ID check, 2) a valid value check for nominal/ordinal variables, 3) a valid range check for continuous variables and 4) cross-table consistency checks.

Data delivery is made through secure channels (i.e. the project's SharePoint site or a secured FTP connection), in a folder to which only specific users have access. All data available on web services are accessible only through encrypted connections (HTTPS/SSL) and access control mechanisms. Each user has only a limited set of user rights.

Provide link to webpage where additional methodological documentation can be found, if any.

Methodology report v.4 (available at: https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf).

Revision

Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

The methodology is updated annually, as the fleet registry is dynamic and may change drastically in several segments (especially smaller ones). Moreover, updates also follow recommendations by RCG ECON and the relevant WGs

Confidentiality

Are procedures for confidential data handling in place and documented? **YES**
Are protocols to enforce confidentiality between DCF partners in place and documented? **YES**
Are protocols to enforce confidentiality with external users in place and documented? **YES**

Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No issues, as far as confidentially and anonymity are kept.

For more details see, Chapter 9 and 10 of the Methodology reports, v.4, available at:
https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf

AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.

Survey planning: No deviations exist
Survey design and strategy: No deviations exist
Estimation design: No deviations exist
Error checks: No deviations exist
Data storage and documentation: No deviations exist
Revision: No deviations exist
Confidentiality: No deviations exist

(Sampling scheme identifier: Fisheries economic_PSS)

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.   *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.*   *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fisheries
Sampling scheme: PSS
Variables: Days at sea   Employment by age   Employment by employment status   Employment by gender   Employment by level of education   Employment by nationality   Energy consumption   Energy costs   FTEs by gender   Full-time equivalent (FTE)

Gross debt

Gross value of landings

Investments in tangible assets (net purchase of assets)

Operating subsidies

Other income

Other non-variable costs

Other variable costs

Paid labour

Personnel costs

Repair and maintenance costs

Subsidies on investments

Total assets

Total hours worked per year (optional)

Unpaid labour

Unpaid labour by gender

Value of unpaid labour

Supra region(s): Mediterranean Sea and Black Sea

Survey planning

Provide a short description of the population the sampling scheme applies to; e.g. 'less active vessels using passive gears'.

The sampling scheme applies to **the total vessel population**. The sample unit is the vessel, and it is selected from the Greek National Fleet Register that corresponds to December 31st of the reference year. Moreover, the sample unit and, therefore, the sampling frame are com for the economic and effort variables following the Commission Decision 2010/93/E.U. (European Commission, 2010 - section A.1.1).

Survey design and strategy

List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc.
Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc .

For the data collection, a sampling scheme of stratified random sampling is chosen. The sample unit is the vessel, and it is selected randomly from each stratum as is described below. The stratified random sampling of the Greek fishing fleet is considered the most proper sampling technique due to the high heterogeneity of the population.
The data collection is based on the probability sample survey using structured questionnaires, filled out by face-to-face interviews with fishermen. The interviewers are fisheries scientists who receive the appropriate yearly training for the correct completion of the questionnaires.

Target and Frame Population
The target population is the total number of registered vessels in the Greek fishing fleet. The fishing gears are divided into active, passive and polyvalent gears (utilization of both active

and passive gears), as Table 1 presents. Table 1 also presents the métiers (fishing activity level 6) that correspond to each fishing gear. In addition, table 1 shows the total number of fishing vessels by main fishing gear (and métier) groups and length class, features that determine the segments of the fishing fleet. Finally, it should be noted that the number of inactive vessels is not taken into account *a priori* as no information is available. Thus, the target population is equal to the frame population.

Table 2 and 3 present the Greek fishing fleet's clustering scheme and the final number of vessels per (clustered) segments, respectively.

Table 1. The segmentation of the Greek fleet according to the European Union Multi-Annual Program (EU-MAP) and the national fleet register was retrieved from EU on September 29th 2021.

	Gears	métiers (Activity level 6)	Length Class				
			VL0006	VL0612	VL1218	VL1824	VL2440
Active Gears	Beam trawlers (**TBB**)	NA in Greece	-	-	-	-	-
	Demersal trawlers and/or demersal seiners (**DTS**)	SB-SV_DEF_0_0_0* OTB_DEF_>=40_0_0*	3	174	38	101	144
	Pelagic trawlers (**TM.**)	-	-	-	-	-	-
	Purse seiners (**PS**)	PS_SPF_>=14_0_0	-	2	81	130	29
	Dredgers (**DRB/DRH**) **	DRH_MOL_0_0_0	11	24	-	-	-
	Vessels using other active gears (**MGO.**)	NA in Greece	-	-	-	-	-
	Vessels using Polyvalent 'active' gears only (**MGP.**)	NA in Greece	-	-	-	-	-
Passive Gears	Vessels using hooks (**HOK**)	LHP-LHM_FIF_0_0_0 LLD_LPF_0_0_0 LLS_DEF_0_0_0 LTL_LPF_0_0_0	1759	2688	121	8	-
	Drift and/or fixed netters (**DFN**)	GNS_DEF_>=16_0_0 GTR_DEF_>=16_0_0 GTN_DEF_>16_0_0 GNC***	3194	5541	177	2	-
	Vessels using Pots and/or traps (**FPO**)	FPO_DEF_0_0_0	57	269	9	1	-
	Vessels using other Passive gears (**PGO.**)	NA in Greece	-	-	-	-	-
	Vessels using Polyvalent 'passive' gears only (**PGP.**)	NA in Greece	-	-	-	-	-
Vessels using active and passive gears (PMP.)		NA in Greece	-	-	-	-	-

* SB-SV_DEF_0_0_0 corresponds to the length classes: VL0612 and VL1218, while OTB_DEF_>=40_0_0 corresponds to the length classes: VL1824 and VL244

**As far the DRB gear is concerned, General Directorate of Fisheries is in the process of changing the gear type from DRB to DRH as the DRB gear does not match the fishing technique which is actually used, which matches the DRH gear. The DRB gear will remain only for vessels that target sponges, and are not allowed to target any other stock.

*** There are only four vessels in the Greek National Fleet Register that report this gear as their main gear. For this reason, this metier is considered as not significant and is incorporated in the GTR_DEF_>=16_0_0, for reasons of similarity.

Table 2: The clustering scheme of Greek fleet segments (based on the Greek National Fleet Register retrieved from EU on September 29th 2021).

Gear	Merged segment		Clustered segment		No of vessels after clustering
	Length Class	**No. of Vessels**	**Length Class**	**No. of Vessels**	
DFN	VL1824	2	VL1218	177	**179** (98.9% DFNVL1218)
DTS	VL0006	3	VL0612	174	**177** (98.3% DTS0612)
FPO	VL1218 VL1824	9 1	VL0612	269	**279** (96.4% FPOVL0612)
HOK	VL1824	8	VL1218	121	**129** (93.8% HOKVL1218)
PS	VL0612	2	VL1218	81	**83** (97.6% PSVL1218)

Table 3: The total number of vessels of the Greek fleet after the clustering of segments (based on the Greek National Fleet Register retrieved from the EU on September 29th 2021).

Gear	VL0006	VL0612	VL1218	VL1824	VL2440	Total
DFN	3194	5541	179	-	-	**8914**
DRH	11	24	-	-	-	**35**
DTS		177	33	106	144	**460**
FPO	57	279	-	-	-	**336**
HOK	1759	2688	129	-	-	**4576**
PS	-	-	83	130	29	**242**

Stratification

The sampling design is based on the stratification of the Greek fishing fleet based on métiers (fishing activity level 6) and vessel length classes, as indicated in Table 4.

Table 4. Strata developed and connection with metier and fleet segments

Strata	Metier	Fleet Segments
SB_0612	SB-SV_DEF_0_0_0	Demersal trawlers and/or demersal seiners (**DTS.**) VL0612
SB_1218		Demersal trawlers and/or demersal seiners (**DTS.**) VL1218
OTB_1824	OTB_DEF_>=40_0_0	Demersal trawlers and/or demersal seiners (**DTS.**) VL1824
OTB_2440		Demersal trawlers and/or demersal seiners (**DTS.**) VL2440
PS_1218	PS_SPF_>=14_0_0	Purse seiners (**PS**) VL1218
PS_1824		Purse seiners (**PS**) VL1824
PS_2440		Purse seiners (**PS**) VL2440

DRH_0006	DRH_MOL_0_0_0	Dredgers (**DRB/DRH**) VL006*
DRH_0612		Dredgers (**DRB/DRH**) VL0612*
LHP-LHM_0006	LHP-LHM_FIF_0_0_0	Vessels using hooks (**HOK**) VL0006
LLD_0006	LLD_LPF_0_0_0	
LLS_0006	LLS_DEF_0_0_0	
LTL_0006	LTL_LPF_60_0_0	
LHP-LHM_0612	LHP-LHM_FIF_0_0_0	Vessels using hooks (**HOK**) VL0612
LLD_0612	LLD_LPF_0_0_0	
LLS_0612	LLS_DEF_0_0_0	
LTL_0612	LTL_LPF_0_0_0	
LHP-LHM_1218	LHP-LHM_FIF_0_0_0	Vessels using hooks (**HOK**) VL1218
LLD_1218	LLD_LPF_0_0_0	
LLS_1218	LLS_DEF_0_0_0	
LTL_1218	LTL_LPF_0_0_0	
GNS_0006	GNS_DEF_>=16_0_0	Drift and/or fixed netters (**DFN**) VL0006
GTR_0006	GTR_DEF_>=16_0_0	
GTN_0006	GTN_DEF_>16_0_0	
GNS_0612	GNS_DEF_>=16_0_0	Drift and/or fixed netters (**DFN**) VL0612
GTR_0612	GTR_DEF_>=16_0_0	
GTN_0612	GTN_DEF_>16_0_0	
GNS_1218	GNS_DEF_>=16_0_0	Drift and/or fixed netters (**DFN**) VL1218
GTR_1218	GTR_DEF_>=16_0_0	
GTN_1218	GTN_DEF_>16_0_0	
FPO_0006	FPO_DEF_0_0_0	Vessels using Pots and/or traps (**FPO**) VL0006
FPO_0612		Vessels using Pots and/or traps (**FPO**) VL0612

*As far the DRB gear is concerned, General Directorate of Fisheries is in the process of changing the gear type from DRB to DRH as the DRB gear does not match the fishing technique which is actually used, which matches the DRH gear. The DRB gear will remain only for vessels that target sponges, and are not allowed to target any other stock.

Furthermore, 12 major (geographical) areas are used for a proportional (geographical) allocation of the sample (for proportional allocation, see also Deliverable 2.1 from MARE/2016/22 SECFISH study). These areas are the following (see also Figure 1): Argosaronikos (ARGSAR), Chios - Mytilene (CH-MIT), Central Ionion (C-ION), Crete (CRETE), Cyclades (CYCL), Dodecanese (DODEC), Evia (EVIA), North Ionion (N-ION), South Ionion (S-ION), Thermaikos Gulf (THERM), Thracian Sea-Limnos (THR-LIM) and Volos-Sporades (VOL-SPOR). The FRI is responsible for the coordination and collection of questionnaires in the regions: Chios - Mytilene, Thermaikos Gulf, Thracian Sea-Limnos and

Volos-Sporades. The HCMR is responsible for the remaining areas.

Figure 1. the 12 Greek Major Areas

Describe how the sample sizes were determined

Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.

The sample size (n) per stratum is estimated as (Dattalo, 2008; Moura, 2016):

$$n = \frac{n_0 \cdot N}{n_0 + (N - 1)} \tag{1}$$

where N is the population size of each métier and

$$n_0 = \frac{z^2 \cdot s^2}{e^2 \cdot \overline{x}} \tag{2}$$

where s is the standard deviation και $\overline{x}$ is the average of the <u>auxiliary variable</u> selected as the one that can better represent the stratum variation. According to Deliverable 2.1 from MARE/2016/22 SECFISH study, auxiliary variables can be utilised for efficient sampling design. In this study, the variable "*days at sea*" is selected as an auxiliary variable, as, according to experts' knowledge, effort is one of the most important sources of variation among variables. The level of significance (z) and the margin of error (e) are selected based on the importance of each stratum, taking into consideration effort and landings data, were available, as well as the number of vessels and expert knowledge. Four different groups of strata, that represent four different level of importance (Very Important, Important, Less Important, No important), have been considered using a different combination of values for e and z (for more information see Table 4.2 of the Methodology Report for Fleet Socio Economic Variables, v.4, available at:

The sample size of each stratum, as it was calculated by equation 2, is adjusted according to equation 3 when the population size of a métier is very small and the sample size is relatively large (n/N>0.05) (see e.g., Thomson, 2002).

$$n_{adj} = \frac{n}{1 + n/N} \tag{3}$$

As mentioned earlier, after the determination of the sample size of the strata, the number of vessels in the sample per major area is determined using the method of proportional allocation (Eurostat, 2008):

$$n_g = \frac{n \cdot N_g}{N} \tag{4}$$

where n is the sample size per stratum, as it was calculated by equation 3, N_g is the sum of vessels of the major area per stratum and N is the population size of each stratum. Using the proportional allocation, the proportions are respected and, consequently, the share of a geographic area population to the total population will be similar to the share of this stratum to the sample size. Decimal values of sample size are rounded up to the nearest integer. Following this procedure for the vessels included in the Greek National Fleet Register that retrieved from the EU on September 29th 2021, the total sample size for the reference year 2021 is set to 761 vessels (for more information, see Table 4.3 of the Methodology Report for Fleet Socio Economic Variables, v.4, available at https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf).

In conclusion, the determination of sample size and the sample geographical allocation is based on the number of vessels of specific métiers and their importance, the vessel length class and the variability of the strata, by taking into account a representative auxiliary variable (days at sea) and the 12 major geographic areas. Then, the sample size per fleet segment is estimated by merging all the strata that included in each segment (e.g., the sample size in the segment DFN_0006 is the sum of the sample size of the following strata: GTR_0006; GNS_0006 and GTN_0006)

For more information on the planned sample size and sample rate per segment, see Tables 4.5 and 4.6 of the Methodology Report for Fleet Socio Economic Variables, v.4, respectively.

Estimation design

Describe method of calculating population estimate from sample.

Statistical inference of population for the economic and social variables is based on the inference of the sample to the active population of fishing vessels (raising). Following, among others, the Deliverable 2.1 from MARE/2016/22 SECFISH study, the Horvitz-Thompson (HT) estimator (Horvitz and Thompson, 1952) is used to allow correct generalization of the sample statistics to the population parameters per stratum:

$$\hat{Y} = \sum_{i=1}^{n} y_i \, \pi_i^{-1} \qquad (5)$$

where $\pi_i = n_{act}/N_{act}$ is the inclusion probability for each stratum, n_{act} the number of active vessels in sample per stratum and N_{act} is the number of active vessels in population per stratum. Then, the estimation of a variable per fleet segment is done by combining the values of the corresponding strata (e.g., a variable of the segment DFN_006 is calculated by adding up the values of the strata: GNS_006+GTN_0006+GTR_0006).

Using the above formula, the number of inactive vessels of the population in each stratum is also estimated before estimating other variables (see also Annex 1.2 for the activity variables). This estimation is done for the strata with vessels shorter than 12 meters, except for the strata utilising the gears SB, LLD and LHM, where inactivity can be based on ERS information.

Describe method of calculating derived data: e.g. imputed values.

In cases of nonresponses and error detection in the database, and if there is no way to resolve these issues otherwise (e.g., communication with interviewer and/or fisher), derived data is estimated using conditional median imputation. This is a methodology more advanced that the, most popular, mean imputation, and in the same rationale with regression imputation (see Deliverable 2.1 from MARE/2016/22 SECFISH study).

More specifically, to cope with nonresponses and unreasonable or extreme values in specific variables, these values are replaced by an estimated value using the medians of one or more auxiliary parameters that are combined to estimate the variables under question in a specific segment. For example, in a particular segment, the parameters "Gross value of landings per kg of live weight", "Landings per day at sea" and "Days at sea" are auxiliary parameters that used for the calculation of the variable "Gross value of landings" at vessel level. These parameters are used to "homogenize" the data as possible and subtract that portion of the variance caused by the diversification of the fishing effort and landings in a specific segment. By doing so, the estimation become more reliable, than in the simpler case of unconditional estimation. The auxiliary parameters used in this analysis are presented in Table 5.

This process is considered as "conditional mean (or median to be more precisely) imputation". The reason is that the error value is not directly replaced by the universal mean (or median), but with the mean that is estimated taking into consideration specific conditions (e.g., specific segment, specific days at sea, specific landings per day at sea" etc.). The rationale of this method is very close to the regression imputation method, another popular method for data imputation (see also Deliverable 2.1 from MARE/2016/22 SECFISH study).

Table 5: Auxiliary parameters for conditional median imputation

Parameters (at the vessel level)
Days at sea
Crew members
Energy consumption per day (Liters/day)
Landings or Production per day (kg/day)

Price (euros/kg)
Repair and maintenance costs per day (euros/day)
Other Variable costs per day (euros/day)
Energy cost per day (euros/day)
Personnel cost per day (euros/day)
Energy cost / Value of landings (%)
Other Variable costs / Value of landings (%)
Repair and maintenance costs / Value of landings (%)
Fixed costs/ Value of landings (%)
Personnel cost / Value of landings (%)
Total costs / Value of landings (%)

Describe treatment of nonresponse.

To address the nonresponse of the sampling unit (vessel), a complementary sample is selected. The complementary sample, as well as the main sample, is drawn randomly. The selection order of the complementary sample is determined in advance to avoid convenient sampling. This action results in the complete nonresponse rate (CNR) being zero. Also, the partial nonresponse (PNR) rate of the collected variables is small due to the appropriate training of interviewers and the ability to resolve any questions in close cooperation with the AGR.E.R.I research team. During the interview, the interviewers pay special attention to the variables which had high nonresponse rates in previous years. Variables with frequent nonresponse are highlighted before the design of the questionnaire. Finally, the percentage of PNR is calculated for each variable.

The PNR cases as well as the missing values which replace the unreasonable/extreme values resulting from the exploratory data analysis are classified into the following categories: missing completely at random (MCAR), missing at random (MAR) and missing not at random (MNAR). A missing value is classified in MCAR if the probability of missing is independent of the variable or from other variables. A missing value is classified in MAR if the missing is random in the variable but it correlates with other variables. For example, the education level is often missing in vessels with a high number of employers. Finally, the missing values that are correlated with the variable are classified as MNAR. For example, the values of annual revenues are missing for vessels with high revenues. The percentage of the three missing values categories is calculated for each variable per fleet segment.

Only the missing values classified in MCAR and MAR are replaced either by unconditional or conditional imputation. In the first case, the missing values of continuous variables are replaced directly by the median of the non-missing values whereas the missing values of nominal variables are replaced by the respective mode value of the variable in a stratum. If two or more values are missing for a specific variable, all the missing values will be substituted by the same number, a fact that leads to underestimation of the true variance due to the imputation of missing values at the centre of the distribution. For the above reasons, conditional median imputation is used in this analysis (see also section 5.3.4. of Deliverable 2.1 from MARE/2016/22 SECFISH study).

Error checks

Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc.

Before the data analysis, data are checked for completeness, cohesiveness and comparability over time. More specifically, exploratory data analysis is used, to locate measurement and processing errors, through unreasonable and extreme values of the data. An unreasonable value is a value that has no natural meaning of interpretation of the variable (e.g., a negative value of a non-negative by definition variable, e.g., landings weight). An extreme value is a considerably remote value, compared to the majority of the rest values.

To identify the problem related to the unreasonable or extreme values that appear on some vessels in basic technical and economic parameters that are used for the estimation of the data call variables, we construct benchmark tables with control ranges per segment for selected auxiliary parameters. Then, to cope with the unreasonable or extreme value problem, the values that are outside the ranges of the benchmark tables are replaced using conditional median imputation, described in the "estimation design". To determine the control ranges of the benchmark tables, we utilise vessel observations during the period 2012-2018. For more information, see chapter. 3.3.3 of the methodology report, available at:

https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf)

The data utilised to determine the ranges derive from observations per vessel during the period 2012-2016.

To locate possible drawbacks in the questionnaire's design or the interviewer's training, the unreasonable values and the extreme values are segmented into:

- incorrect values due to the questionnaire's design,
- incorrect answers caused by the interviewer and
- incorrect answers of the interviewee

The incorrect values due to the questionnaire's design include the values that are repeated in different segments of the fishing fleet and are located in data coming from different interviewers. The incorrect answers caused by the interviewer consist of the values that are repeated in the data coming from the same interviewer and are related either to guided responses during the interview, incorrect coding or data entry. The incorrect answers of the interviewee contain the values that cannot be classified into the other two categories. It should be noted that the questionnaire does not include questions in free text format

Data storage and documentation

Describe how the data is stored.

The survey files including case information are created using a specific layout. The survey data can be unequivocally mapped to the internationally required fields, codes and formats if asked. Deviations from the prescribed record format must be reconciled before the data can be integrated for further processing.

All data collected are imported into a database, following specifications in the corresponding operational manuals and national record layouts. All data are verified for structural consistency within and across sources and for agreement with the defined formats and record layouts. It has to be assured that sample design and disposition data are recorded for every case. All adaptations are thoroughly tested prior to the production use of the data integration software.

Data are imported on a regular and incremental basis as the survey progresses. Adaptations to the context are reflected in the record layout before data are imported, based on the corresponding documentation. The verification of the database includes the following: 1) a unique ID check, 2) a valid value check for nominal/ordinal variables, 3) a valid range check for continuous variables and 4) cross-table consistency checks.

Data delivery is made through secure channels (i.e. the project's SharePoint site or a secured FTP connection), in a folder to which only specific users have access. All data available on web services are accessible only through encrypted connections (HTTPS/SSL) and access control mechanisms. Each user has only a limited set of user rights.

Provide link to webpage where additional methodological documentation can be found, if any.
Methodology report v.4 (available at:
https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf).

Revision

Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

The methodology is updated annually, as the fleet registry is dynamic and may change drastically in several segments (especially smaller ones). Moreover, updates also follow recommendations by RCG ECON and the relevant WGs.

Confidentiality

Are procedures for confidential data handling in place and documented? **YES**
Are protocols to enforce confidentiality between DCF partners in place and documented? **YES**
Are protocols to enforce confidentiality with external users in place and documented? **YES**
Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No issues, as far as confidentially and anonymity are kept.

For more details see, Ch. 9 and 10 of the Methodology reports, v.4, available at:
https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v4.pdf

AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.

Survey planning: No deviations exist
Survey design and strategy: Deviations only refer to the updated population, as the one reported in the WP was retrieved from Union Fishing Fleet Registry on September 29th 2021
Estimation design: No deviations exist
Error checks: No deviations exist
Data storage and documentation: No deviations exist
Revision: No deviations exist
Confidentiality: No deviations exist

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Aquaculture
Sampling scheme: NPS (Non-Probability Sample Survey)
Variables: All Economic and Social variables
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
1.   Provide a short description of the population to which the sampling scheme applies, *e.g. 'less active vessels using passive gears'.* In Greece, the seabass and seabream segment constitute the largest part of aquaculture production, followed by the mussel, trout, and other freshwater fish. In Greece, 20% of the aquaculture companies are SA and Ltd enterprises that demonstrate over 80% of the total sector's yearly sales. The largest companies operate in the Seabass & Seabream sector. In Greece, most aquaculture units are not economically autonomous units and there are cases where a single company may own or rent numerous fish farms, especially in the case of seabass-seabream. According to 2018, the 650 units belong to 407 companies. Of those 650 aquaculture units, 357 employ less than 6 persons, 117 have 6-10 employees and 176 have more than 10 employees. For the 2022-2024 period, the Non-Probability Sample Survey (NPS) sampling scheme will be applied since the planned sample rates range from 40% to 70% because for the past 7 years the data collection was implemented by census achieving high response rate percentages. Regarding the social variables, the planned sample rates for 2022-2024 are set accordingly to the previous 3-year social pilot study high percentage response rates (ranging from 40% to 50%). even though the last years of the pilot study took part during the covid-19 lockdown measure periods.
Survey design and strategy 1.   List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc. 2.   Describe how the sample sizes were determined.

3. Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc.
4. Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.

The data sources will include questionnaires filled during onsite and online interviews and sent by mail, by post and by phone, published balance sheets and companies' financial reports, and for cross checking and validation purposes, the survey will use EUROSTAT and National Statistics data and the Integrated Monitoring System of Fisheries Activities (OSPA) operating under Ministry of Rural Development and Food. The results of previous years' surveys and the structure of the Greek aquaculture sector, the farming species, the method used and, above all, the geographical location of the units, will all contribute as factors for the division of the unit population into subpopulations. Those subpopulations that share the same characteristics will be used for the sampling in order to calculate the socio-economic variables of the whole sector. Therefore, the NPS sampling scheme will be used to create subpopulations based on farmed species and geographical locations for the categories "Mussel", "Trout" and "Freshwater". For the category Seabass-Seabream which constitutes the largest percentage of the industry (75% according to sales value), additional subpopulations will be created based on the existence of the following three criteria: operation under the same company of on-growing units, hatcheries-nurseries, and fish feed production units. This is because these specific criteria affect the economic variables of the units. For example, companies that own and operate on-growing units and hatcheries nurseries, are self-sufficient regarding supply of fry and take advantage of lower production costs due to a lower fry price.

Estimation design

1. Describe method of calculating population estimate from sample.
2. Describe method of calculating derived data: e.g. imputed values.
3. Describe treatment of nonresponse.

The aquaculture survey population includes all companies in Greece included in an updated annual list published every year by the Ministry of Rural Development and Food that includes the number of aquaculture units that are active for the respective year and their production capacity, which is usually fully covered for the largest percentage of companies.

The NPS sampling scheme will follow the typical quota sampling steps that include:

1. Division of the population into subpopulations according to aquaculture technique, the production capacity, the geographical location, and the operating facilities in the case of seabass-seabream companies. These subpopulations, due to their unique characteristics will be considered as separate populations, leading to four different surveys.
2. Definition of the weightage of subpopulation characteristic (production volume and number of employees)
3. Selection of the appropriate sample size, maintaining the proportion
4. Implementation of the surveys according to the defined quotas

The different aquaculture techniques will be used for the first designation of subpopulations for the application of the NPS sampling scheme. The second subpopulation designation will use the production capacity of companies belonging to the same aquaculture technique. The third subpopulation division will be applied according to the geographical-spatial location. The fourth subpopulation division, as mentioned, will only apply to seabass-seabream companies as some have hatcheries-nurseries units and fish feed production units. Those activities have different characteristics and correspond to different employee structure and will be used therefore for the designation of subpopulations. For example, certain mussel companies operate mussel purification units with additional personnel and energy costs and some trout companies demonstrate parallel processing activity (smoking/filleting) and they will be used as subpopulations for sampling. The NPS survey samples will include companies that meet the following conditions: Published balance sheet, inclusion in Ministy's database for the reference year and participation in previous annual surveys for the collection of fisheries data.

All variable values in the data collection are extracted from the questionnaires and the balance sheets data except the variables of other income, value of unpaid labour, energy cost, and other operating costs (imputed values) which will be calculated according to the provided data. Other income will be calculated by subtracting the main activity income from the total turnover, according to the companies' statements. In the case of two parallel activities, the secondary activity revenue is considered as other income as some companies demonstrates sales of aquaculture equipment or fry sales. The value of unpaid labour is calculated by multiplying the company's unpaid personnel working hours with the average wage in case of owner or co-owner labour and minimum wage value in case of other family members. Other operating cost, in the case it is not accurately stated in the balance sheets and questionnaires, is derived from the total production cost.

Companies that fail to show activity according to fisheries directorates, are not included for the last 3 years in the Ministy's database, produce no balance sheet or economic reports and did not respond to questionnaire inquiries, will be excluded from the population.

In nonresponse cases, the missing variable values will be calculated with the method of method of mean imputation (5.3.2. of Handbook) and missing values will be replaced with mean value statistics following the stratification according to the subgroup it belongs to and crosschecked with previous years' respective data.

Error checks

1.   Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc

In the data collection uploading procedure, each company corresponds to a unique code that contains the area code of its location of operation and a unique VAT number in order to avoid duplicate entries in social and economic data. Also, the variable values are compared to the previous year's respective values.

Furthermore, raw data inputs and intermediate results are compared to corresponding previous year data in each category during their entry in the data base and in case of significant

differences between the two years or data inconsistencies, an effort is applied for confirmation of the data validity.

Data storage and documentation

1.   Describe how the data is stored.
2.   Provide link to webpage where additional methodological documentation can be found, if any.

Data is stored first in spreadsheets for processing and then uploaded on the FRI data base.

The methodological documentation has been uploaded and are available on the following link:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Data_Quality_Aquacalture%26 Processing Industries.pdf

Revision

1.   Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

The NWP methodology will be reviewed annually. The results of the first year of the 2022-2024 NWP implementation will be evaluated regarding the survey method applied, taking especially into account the fact that it will be the first survey year following the covid-19 lockdown measures period.

Confidentiality

1.   Are procedures for confidential data handling in place and documented?
2.   Are protocols to enforce confidentiality between DCF partners in place and documented?
3.   Are protocols to enforce confidentiality with external users in place and documented?
4.   Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

Data sources for both sectors, aquaculture, and processing, are companies' published balance sheets and questionnaires. Since balance sheets are available mostly online from companies' websites and Ministry of Finance's databases, due to enterprises' obligation to publicize them, confidentiality is mainly pointed out during pre-data collection communications and during on site interviews, where interviewees are assured about the confidentiality of the data they provide, and no personal data is collected.

AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.

Survey planning: No deviations exist

Survey design and strategy: No deviations exist

Estimation design: No deviations exist

Error checks: No deviations exist

Data storage and documentation: No deviations exist

Revision: No deviations exist

Confidentiality: No deviations exist

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Processing
Sampling scheme: NPS (Non-Probability Sample Survey)
Variables: All Economic and Social variables
Supra region(s): Mediterranean and Black Sea
Survey planning
1.   Provide a short description of the population the sampling scheme applies to; e.g. 'less active vessels using passive gears'. In Greece, the sector is comprised mostly of very small companies and most enterprises (more than 70%) show a secondary economic activity. According to the fisheries processing companies' registry and the previous data collection surveys, during the last 9 years the number of average active processing companies ranged from 170-190. For 2019, 139 companies belong to the <11 employees' category, 37 belong to the 11-49 category and 8 belong to the 50-250 category. The main processing activities are: freezing, processing (filleting, salting, drying, smoking, marinating, cooking, canning) and deshelling of mussels. The activity segmentation is very important for the sampling strategy. For the 2022-2024 period, the Non-Probability Sample Survey (NPS) sampling scheme will be applied since the planned sample rates range from 40% to 70% for the past 9 years when the data collection was implemented by census, achieving high response rate percentages. For social variables the planned sample rates are lower following the 3-year social pilot study that produced significantly lower response rate due to the fact that the companies were not accustomed to the new social section of the questionnaire (education, employment status, nationality, age) and most importantly the last years of the pilot study took part during the covid-19 lockdown measure periods. An indirect survey will also be applied for the companies with processing as secondary activity with low production and sales value for the sales and production volume variables only.
Survey design and strategy 1.   List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc. 2.   Describe how the sample sizes were determined. 3.   Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc. 4.   Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing,

fall back data source etc.

Data sources will include questionnaires filled during onsite and online interviews, sent by mail, by post and by phone, published balance sheets and companies' financial reports. For cross checking and validation purposes, the survey will use EUROSTAT and National Statistics data and the Integrated Monitoring System of Fisheries Activities (OSPA) operating in Ministry of Rural Development and Food.

The timeline data produced during the 9-year census survey and the 3-year pilot study of social variables, as well as the achieved response rates of the 2020 survey during the covid-19 lockdown period, led to the creation of subpopulations following the segmentation by company size and by processing activity and guided the designation of planned sample rates since each activity demonstrates different socioeconomic characteristics. Two distinctive examples are the seasonality of mussel deshelling and the high energy costs of the freezing sector due to its significantly higher energy needs. Therefore, a quota sampling through the NPS sampling scheme will be applied creating subgroups for the freezing, processing and deshelling activities following at the same the company size categorization by employees' number, the experience of the previous data collection surveys helped creating a list of reliable company sources for every subgroup that responded in every annual survey and produced reliable financial records and reports for cross checking purposes.

Estimation design

1. Describe method of calculating population estimate from sample.
2. Describe method of calculating derived data: e.g. imputed values.
3. Describe treatment of nonresponse.

The survey population consists of all companies in Greece that operate under a fish processing veterinary code that differs for each of the three processing activities (freezing, processing, and deshelling of mussels) and categorizes companies according to their activity. Those activities have different characteristics (i.e. assets, cost structure) and correspond to different employee structure (for example deshelling of mussels activity employs more women whereas freezing activity employs twice as many men than women) and they will be used as subpopulations for sampling. Those distinct differences are used for the designation of subpopulations. To avoid overlapping in the cases where a company demonstrates two parallel processing activities, holding therefore two veterinary codes, it will be categorized by its main processing activity. The survey samples will include companies that meet the following conditions: Published balance sheet, considerable processing activity of more than 500 thousand euros annual revenue, participation in previous annual surveys for the collection of fisheries data and inclusion of their production and sales data in lists of government and statistical authorities (annual subsidies data) for cross-checking purposes.

The NPS sampling scheme will follow the typical quota sampling steps that include:

1. Division of the population into subpopulations according to processing technique (freezing, processing, and deshelling of mussels). These subpopulations, due to their unique characteristics will be considered as separate populations, leading to three different surveys.

2. Definition of the weightage of subpopulation characteristic (production volume, number of employees and facilities/assets)
3. Selection of the appropriate sample size, maintaining the proportion
4. Implementation of the surveys according to the defined quotas

All variable values in the data collection are extracted from the questionnaires and the balance sheets data except the variables of other income, Value of unpaid labour and other operating costs (imputed values) which will be calculated according to the provided data. Other income will be calculated by subtracting the main activity income from the total turnover, according to the companies' statements and the respective veterinary code characterization. In the case of two parallel activities, the secondary activity revenue is considered as other income. The value of unpaid labour is calculated by multiplying the company's unpaid personnel working hours with the average wage in case of owner or co-owner labour and minimum wage value in case of other family members. Other operating cost, in the case it is not accurately stated in the balance sheets and questionnaires, is derived from the total production cost. Companies that fail to show activity according to fisheries directorates, produce no balance sheet or economic reports and did not respond to questionnaire inquiries, will be excluded from the population. In non-response cases, the missing variable values will be calculated with the method of method of mean imputation (5.3.2. of Handbook) and missing values will be replaced with mean value statistics following the stratification according to the category of processing activity and size by employment the company belongs to and crosschecked with previous years' respective data.

Error checks

1. Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc.

In the data collection uploading procedure, each company corresponds to a unique code that contains the area code of its location of operation and a unique VAT number in order to avoid duplicate entries in social and economic data. Also, the variable values are compared to the previous year's respective values.Furthermore, raw data inputs and intermediate results are compared to corresponding previous year data in each category during their entry in the data base and in case of significant differences between the two years or data inconsistencies, an effort is applied for confirmation of the data validity.

Data storage and documentation

1. Describe how the data is stored.
2. Provide link to webpage where additional methodological documentation can be found, if any.

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Revision

1. Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

The NWP methodology will be reviewed annually. The results of the first year of the 2022-2024 NWP implementation will be evaluated regarding the survey method applied, taking especially into account the fact that it will be the first survey year following the covid-19 lockdown measures period

Confidentiality

1. Are procedures for confidential data handling in place and documented?
2. Are protocols to enforce confidentiality between DCF partners in place and documented?
3. Are protocols to enforce confidentiality with external users in place and documented?
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

Data sources for both sectors, aquaculture, and processing, are companies' published balance sheets and questionnaires. Since balance sheets are available mostly online from companies' websites and Ministry of Finance's databases, due to enterprises' obligation to publicize them, confidentiality is mainly pointed out during pre-data collection communications and during on site interviews, where interviewees are assured about the confidentiality of the data they provide, and no personal data is collected.

AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.

Survey planning: No deviations exist

Survey design and strategy: No deviations exist

Estimation design: No deviations exist

Error checks: No deviations exist

Data storage and documentation: No deviations exist

Revision: No deviations exist

Confidentiality: No deviations exist

APPENDIX

MEDIAS SURVEY OUTPUT MAPS
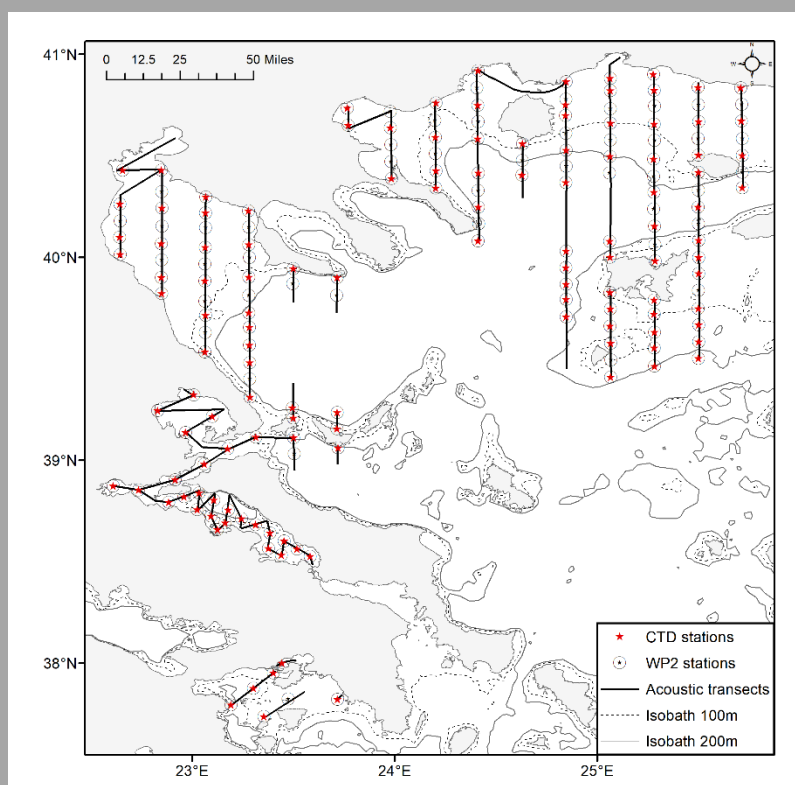
Fig 2. Acoustic transects sampled in the MEDIAS survey of the Hellenic part of northern Aegean Sea (GSA 22) in June-July 2022. The position of CTD and plankton stations sampled are also shown.
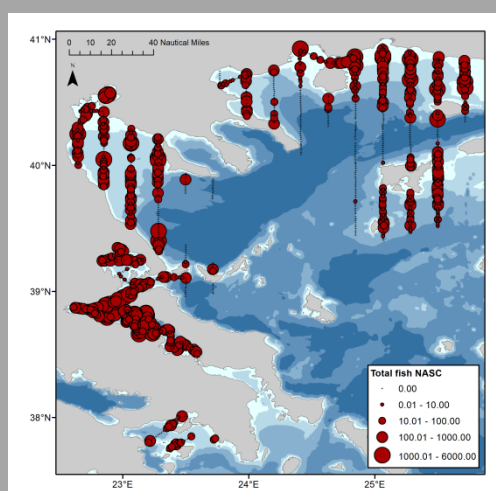
Fig 3. The distribution of the total fish NASC (m²/nm²) per EDSU of northern Aegean Sea (GSA 22) in June-July 2022.
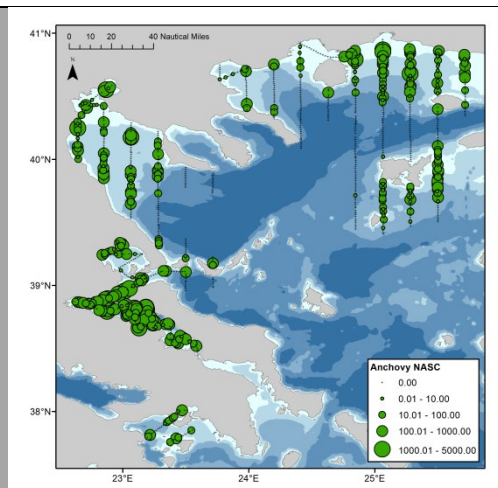
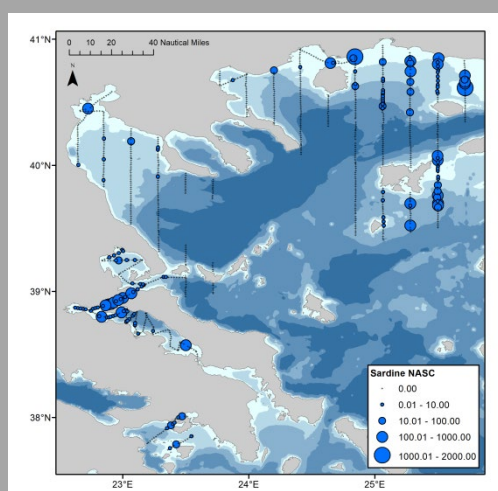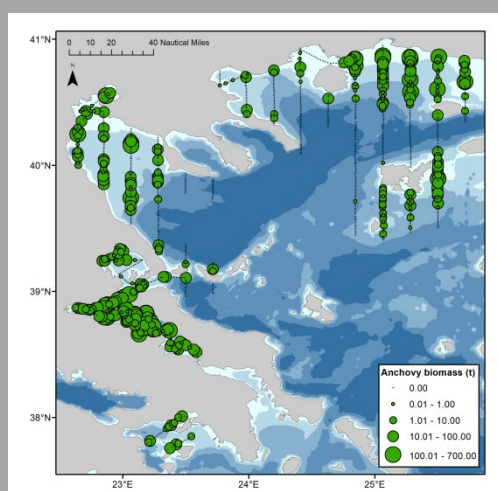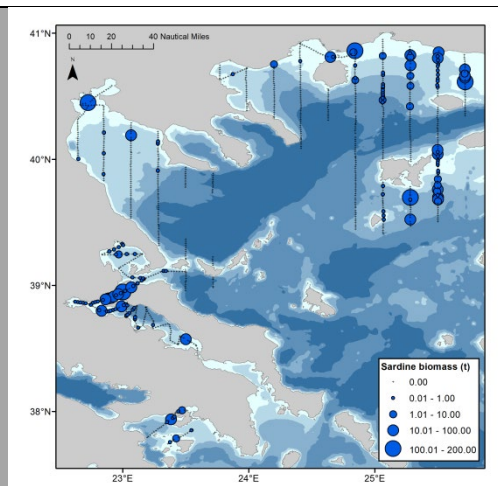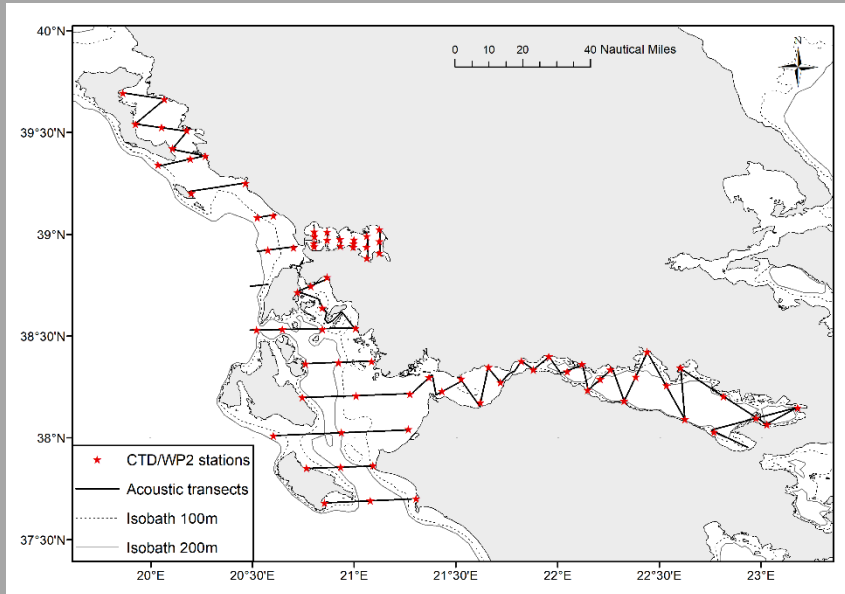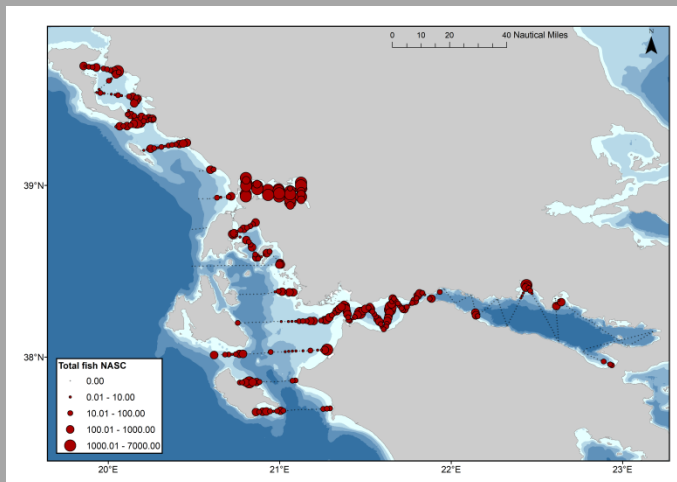**Fig 4. The distribution of the anchovy NASC (m²/nm²) per EDSU of northern Aegean Sea (GSA 22) in June-July 2022.**

Fig 5. The distribution of the sardine NASC (m²/nm²) per EDSU in northern Aegean Sea (GSA 22) during June-July 2022.

Fig 6. The distribution of the anchovy biomass (t) per EDSU in northern Aegean Sea (GSA 22) during June-July 2022.

Fig 7 The distribution of the sardine biomass (t) per EDSU Hellenic part in northern Aegean Sea (GSA 22) during June-July 2022.
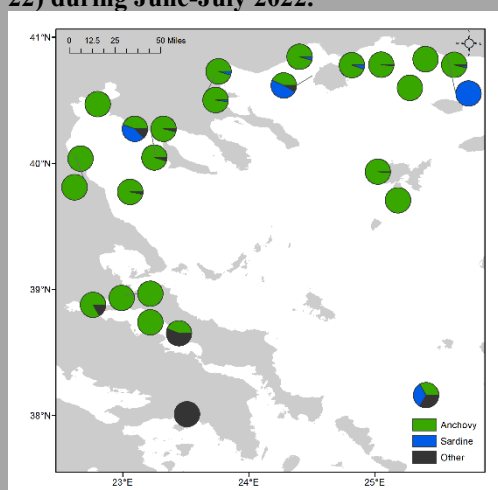
Fig 8. The catch compositions of the hauls (species kg/haul) weighted per hauling hour in northern Aegean Sea (GSA 22) during June-July 2022.

Ionian Sea (GSA 20) MEDIAS survey

Fig 9. Acoustic transects sampled in the MEDIAS survey of the Hellenic part of Ionian Sea (GSA 20) in September 2022. The position of CTD and plankton stations sampled are also shown.

Fig 10. The distribution of the total fish NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during September 2022.
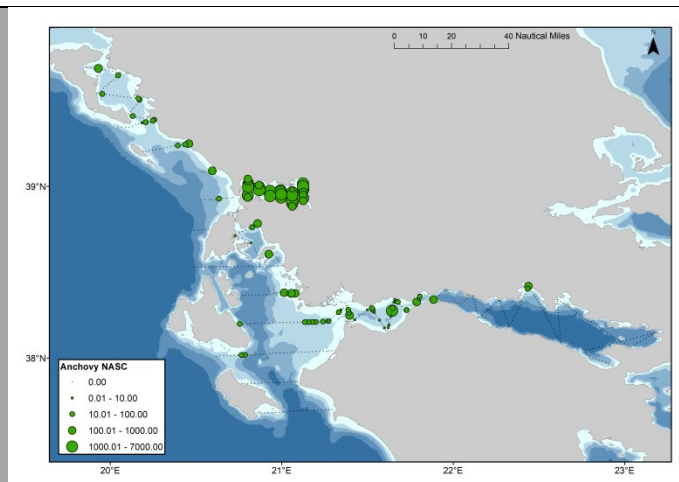
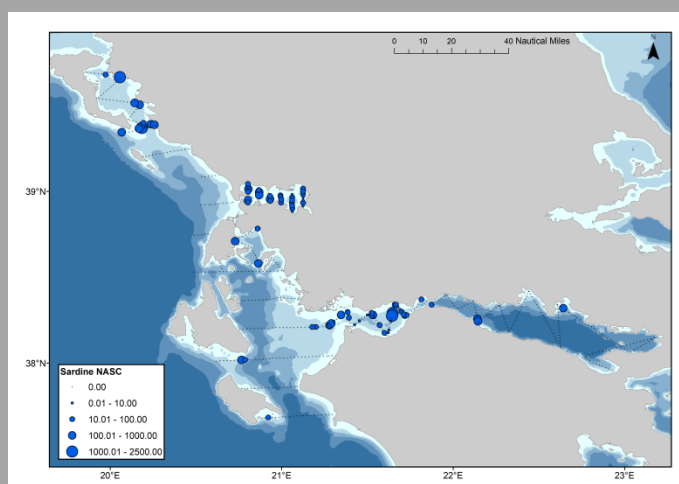**Fig 11. The distribution of anchovy NASC (m²/nm²) per EDSU in eastern Ionian Sea during September 2022.**

Fig 12. The distribution of sardine NASC (m²/nm²) per EDSU in eastern Ionian Sea during September 2022.
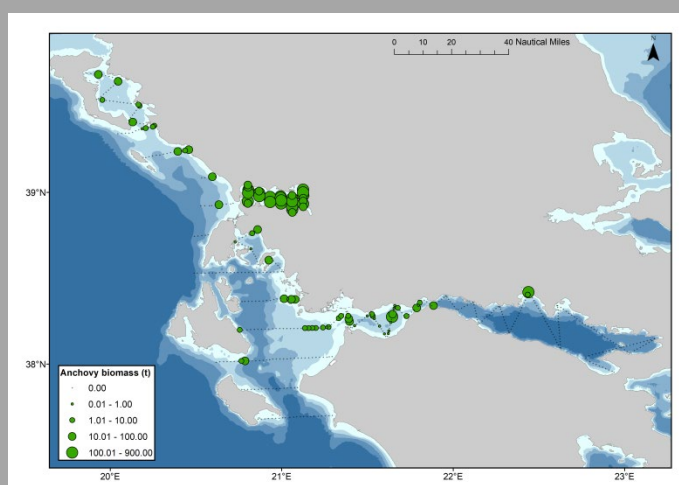

Fig 13. The distribution of anchovy biomass (t) per EDSU in eastern Ionian Sea during September 2022.
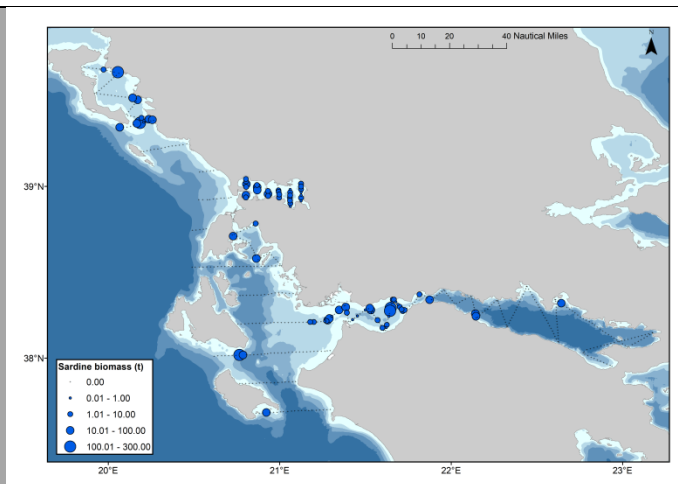
Fig 14. The distribution of sardine biomass (t) per EDSU in eastern Ionian Sea during September 2022.

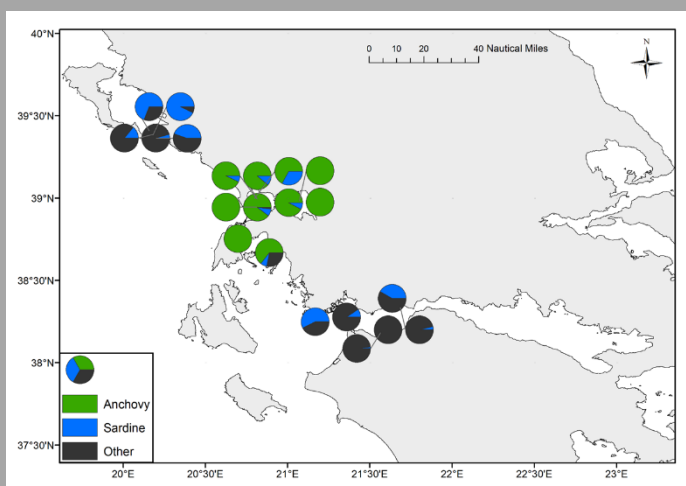**Fig 15. The catch compositions of the hauls (species kg/haul) weighted per hauling hour in eastern Ionian Sea during September 2022.**