

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 Work Plan for data collection in the fisheries and aquaculture sectors

2025-2027

Version 4 – 2024

Athens, 15 October 2024

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SECTION 1: GENERAL INFORMATION

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.

The Data Collection Programme is coordinated by the Directorate General for Fisheries of the Ministry of Rural Development and Food, with Mr Konstantinos Katsafaros as national correspondent. His deputy in case of absence is Dr Michael Chatziefstathiou (mchatzief@minagric.gr), head of the Common Fisheries Policy & Common Market Organisation Department.

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The Fisheries Data Collection Programme in Greece is implemented by two partners, the Hellenic Agricultural Organisation - DIMITRA (ELGO DIMITRA), which is the project coordinator, and the Hellenic Centre for Marine Research (H.C.M.R.). From ELGO DIMITRA, the Fisheries Research Institute (F.R.I.), which is the scientific coordinator of the project, and the Institute of Agricultural Economics Research Institute (AGR.E.R. I) are participating. F.R.I is responsible for the collection of scientific data in the fisheries sector in the North and Central Aegean, for the collection of data related to eel and for the collection of data related to the fish processing industry and aquaculture. AGR.E.R. I is responsible for monitoring and processing social and economic data in the fisheries sector. The Institute of Marine Biological Resources and Inland Waters (I.M.B.R.I.W), based in Athens and Crete, participates from HCMR. I.M.B.R.I.W is responsible for the collection of scientific data in the fisheries sector in the South Aegean, Ionian and Cretan Seas, for the MEDIAS scientific survey, while all other actions are jointly implemented (see Table 1). All data are stored in local databases and feed the national database. In the present Work Plan, there are no major methodological changes, compared to previous period's one. Attention has been paid to the emphasis requested by the Marine Action Plan on the monitoring of by-catches of sensitive species and fisheries impact on marine habitats. An enhanced sampling programme of commercial SSF and a new study on the footprint of SSF on marine habitats will serve this purpose.

The contact details of the participating institutes are:

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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	FRI - HCMR-AGR.E.R.I
5.2: Economic and social variables for fisheries data collection strategy	FRI - HCMR-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	

Text Box 1a: Test studies description

Region: Mediterranean and Black Sea

Test study: Additional Social Variables

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

Name of the national test study: Additional Social Variables

1. Aim of the test study

The aim of the pilot study is to collect and analyze data required to estimate a group of social indicators that were discussed during the EWG 24-05 and further investigated under the ISSG Meeting: Exploring options for data collection for new social variables (18-19 September 2024, Virtual, report pending). These social indicators are organized into four broad categories, which are detailed in the following sections:

- Social and Financial Status
- Working conditions
- Assessment of management measures
- Generational status

After thoroughly reviewing the social indicators, available data sources, and its resources, the MS plans to collect a set of 8 social variables during 2025, as outlined in the following table

Variable group	Variable	Data source(s)
Social and Financial Status	1. Financial position/ quantitative (also as well-being indicator) compare average income of fishers—both self-employed (vessel owners) and employees (crew)—with national income averages.	Socioeconomic module of the Greek DCF; National Statistical Authorities, and EUROSTAT.
	2. Number of fishers in Trade Unions	Ministry of Rural Development and Food; trade union registers
Working conditions/ Work Safety	3. Age of fishing vessels: Measured in years, indicating the potential risk associated with older vessels	Fleet registry
	4. Number of Crew on vessels	Socioeconomic module of the Greek DCF
Working conditions/ Well- Being	5. Time Away from Home (Quantitative) In terms of days at sea	Socioeconomic module of the Greek DCF
Assessment of management measures	6. Additional income to support fishing continuity As % to total income or time allocated to fisheries/total employment	Socioeconomic module of the Greek DCF
Generational status	7. Number of new entrants in the vessel register Identify new fishing enterprises	National vessel registry in first and last day of the reference year
	8. Number of participants in decommissioning schemes	Ministry of Rural Development and Food

These social indicators will enable a more detailed and comprehensive socioeconomic analysis of the fishing fleet, moving beyond the existing variables collected under the regular data collection scheme. The pilot study

will collect variables that offer deeper insights into the social status of the Greek fishing fleet, shedding light on aspects such as generational status and working conditions. This is particularly important in Greece, where the fishing sector, especially Small-Scale Fisheries (SSF), plays a vital role in local economies and significantly contributes to the social cohesion of coastal communities.

As such, the results of this study are of interest to a wide range of stakeholders, including European and national authorities and advisory bodies, as well as other organizations, such as NGOs, with a particular focus on the social status of fisheries in Greece.

2. Duration of the test study

The test study will be held in 2025

3. Methodology and expected outcomes of the test study

The following social variables:

- Financial position/ quantitative (also as well-being indicator)
- Number of Crew on vessels
- Time Away from Home (Quantitative)
- Additional income to support fishing continuity

are planned to be collected using the same sampling scheme as the socioeconomic data collection scheme (see probability sampling survey in fisheries socioeconomic variables in Annex 1.2). The following variables:

- Number of fishers in Trade Unions
- Age of fishing vessels
- Number of new entrants in the vessel register
- Number of participants in decommissioning schemes

will be collected using secondary census data sources, primarily from central administration.

The test study will be conducted at the national level, covering all segments of the Greek fishing fleet. The report on the social variables will be presented at the fleet segment level.

The probability sampling survey design for the estimation of the variables:

- Financial position/ quantitative (also as well-being indicator)
- Number of Crew on vessels
- Time Away from Home (Quantitative)
- Additional income to support fishing continuity

will align fully with the one used for most socioeconomic variables (see Annex 1.2 for probability sampling survey in fisheries socioeconomic variables).

Further details regarding the collection and estimation of social variables, as well as the duration of the test study, will be outlined in a dedicated RCG ECON workshop scheduled for the first quarter of 2025. These specifications will be important for harmonizing data collection and calculating the variables across MSs thus mitigating the risk of misinterpretation or divergence.

The expected outcome of the pilot study is to assess the feasibility of collecting data for the additional social variables discussed during EWG 24-05 and the subsequent RCG ECON ISSG meeting. The study aims to

identify challenges and issues during data collection and identify solutions for overcoming these challenges in potential future data collection activities.

To achieve these objectives, the socioeconomic questionnaire will be updated and reassessed. Additionally, instructions for data collectors and the database will be updated to include social variables, and the estimation procedures will be validated.

(max 900 words per study)

Region: Other regions

Test study: Test study on CKMR on bluefin tuna

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

Name of the regional test study: Test study on CKMR on bluefin tuna

RWP LP 2025-2027

The Atlantic-Wide Research Programme for Bluefin Tuna (ICCAT GBYP) has confirmed the feasibility of using Close-kin Mark Recapture (CKMR) and epigenetics for age determination for the eastern stock of Atlantic bluefin tuna. The full feasibility study will be presented to the SCRS in 2024, when spatially modelled and intensive biological sampling for genetic purposes in the Mediterranean Sea is expected.

National specifics if applicable

Despite the inclusion of the test study in the RWP of the RCG LP, the test study is pending evaluation by the ICCAT SCRS (Standing Committee on Research and Statistics) in 2024.

In case of positive evaluation Greece will contribute in biological sample collection.

Text Box 1b: Other data collection activities

Region: Mediterranean and Black Sea, North Atlantic, North Sea & Eastern Arctic, Baltic, Other regions, Outermost regions

Activity: Support the operation and functioning of the RCG's Secretariat

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: RCG's Secretariat

RWP Med&BS 2025-2027; RWP LP 2025-2027; RWP ECON 2025-2027

All information is in the RWP, there are no specific national aspects.

(max 250 words per study)

Activity: Regional Coordination taking place in ISSGs and pan regional cooperation between RCGs

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: Regional Coordination taking place in ISSGs and pan regional cooperation between RCGs

RWP Med&BS 2025-2027; RWP LP 2025-2027; RWP ECON 2025-2027

All information is in the RWPs, there are no specific national aspects.

(max 250 words per study)

Region: Mediterranean and Black Sea

Activity: Med&BS Regional data base (RDBFIS)

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: Med&BS Regional data base (RDBFIS)

RWP Mediterranean and Black Sea 2025-2027

All information is in the RWP, there are no specific national aspects.

(max 250 words per study)

SECTION 2: BIOLOGICAL DATA

Text Box 2.3: Diadromous species data collection in freshwater

Region: Mediterranean and Black Sea.

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.

For the three EMUs, where eel populations exist in Greece (EMU1, EMU2 and EMU3), biological data on silver eels (*Anguilla anguilla*) populations will be collected. The silver eels' samples are collected from the permanent installed fishing traps (barriers), in the channel connecting the lagoons with the sea that are operated by Fishing co-operatives (fisheries dependent sampling), these traps catch all the migrating silver eels.

For the period 2025 – 2027, the sampling scheme that was 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-year period.

For silver eels (descending eels), data on length and other biological variables will be collected on site in different EMU every year. The target is to collect 50 samples annually from different EMU, resulting in 150 samples from all EMUs at the end of the three-year period. To minimize mortality rates within the migrant population, non-lethal methods will be performed to collect biological variables.

Regarding the standing population (yellow eels), the sampling scheme includes the use of fyke nets placed consecutively (20 sets of fyke nets, 100 m total length), in random stations in selected lagoons, in an effort to cover the whole area of each lagoon. At least six (6) samplings trips will be conducted per year.

Due to the inability to capture glass eels during the previous years, no further attempts will be performed.

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

Region: Mediterranean and Black Sea

General comment: This text box fulfils Article 5(2)(a), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 2.2 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used to collect data on marine and freshwater recreational catches. For freshwater diadromous species, use Table and Text Box 2.3.

(RWP Mediterranean and Black Sea, implementation years:2025-2027)

The regionally agreed sampling schemes are described in the RWP Mediterranean and Black Sea 2025-27. Greece participates in all of them, both binding and non-binding, and does not implement any sampling scheme outside the RWP.

The national specifics are described below:

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 2025-2027 and the aim is to collect data with primary objectives as are detailed in the RCG MedBS RWP 2025-2027.

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 (Official ban of eels' recreational fishery: Ministerial Decision 643/39462/01-4-2013; Official ban of sharks & rays' fishery: Ministerial Decision 4531/83795/20-7-2016; Official ban of *Thunnus alalunga*, *Thunnus thynnus*, *Xiphias gladius* recreational fishery: Ministerial Decision 5632/104626/2015).

Since the survey is multispecies, the biological parameters that are planned to be collected concern the species caught and released, and include 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 2025-2027, combines off-site and on-site surveys, since a licensing system for recreational fisheries does not exist in the country.

The binding off-site survey (**GR_REC_Ofs**) will be conducted, according to the RCG MedBS RWP 2025-2027 framework, by a market research and opinion polls agency. The telephone survey will be conducted during 2026 since the previous survey was conducted on 2023. Via the telephone survey, the recreational fishermen are also invited to try and use the available self-reporting tools.

The binding self-reporting tools include an already in place self-reporting website (<https://erasitexniki.inale.gr>) and a mobile application under the name (GRecFish). These tools provide potential users with an easy and immediate tool of self-sampling 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 in order to maximize the number of participants.

The non-binding on-site survey (**GR_REC_OnS**) will be conducted according to the RCG MedBS RWP 2025-2027 framework. It will be carried out quarterly by Fisheries Research Institute's (FRI) & Hellenic Center for Marine Research's (HCMR) observers in randomly selected sites within the relevant GFCM geographical areas, including piers, ports, beaches and remote sites. The on-site survey (independent monitoring) allows for cross-checking with self-reported data and increases the validity of the data as it ensures correct recognition of the species and recording of the length of the species in the catches.

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>.

Text Box 2.5: Sampling plan description for biological data

Region: Mediterranean and Black Sea

Sampling scheme name: Commercial sampling at Sea

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

Sampling scheme name (or identifier): SeaComTripallsp

Additional information on sampling schemes

For bottom otter trawls (OTB_DEF, OTB_MDD) and purse seines (PS_SPF), 100% of the trips are conducted with observers on board (SciObsAtSea), while for small-scale fisheries (GNS_DEF, GTR_DEF, LLS_DEF, FPO_DEF, LLD_LPF) about 70% of the planned trips are conducted with observers on board (SciObsAtSea).

Additional description of sampling frames

For commercial sampling at sea, all hauls are selected (no stratification) and within each haul all catch fractions (landings, discards, unwanted catches) are sampled. A random sample of 50-100 individuals are recorded for

length, total weight and sample weight per catch fraction. For discards, when the total volume is very high, as is often the case with bottom otter trawls, at least 10% of the volume in each haul is used for sampling.

For the sampling of biological variables, the species selected are listed in Table 2.2 of the Greek WP. The stratification of stocks into groups (Group 1,2,3) and the sampling frequency for biological variables (other than length) proposed by the GFCM-DCRF have been adopted in accordance with Recommendation 10 of RCG Med& BS 2021. During the sampling on board, a sample of the catch of each target species (species included in Table 2.2 of the Greek WP) is randomly selected and transferred to the laboratory in order to obtain all the necessary biological information.

For the métier OTB_DWS, which was included in the sampling from 2023 in GSA 20 in order for the MS to comply with the GFCM/42/2018/4 recommendation and management needs, after almost 2 years of sampling we concluded that it is a mixed fishery for both demersal and deep-sea species, therefore we change the métier to OTB_MDD (mixed demersal and deep-sea species).

For the SB-SV_DEF métier, which was not sampled from 2021 onwards for administrative reasons, we have removed it from the MS sampling plan and redistributed the number of PSUs planned for boat seines to the other small-scale fisheries métiers according to the 2nd license held by each vessel.

To facilitate species identification, molecular techniques (DNA barcoding) are used, where necessary, to identify species quickly and accurately and to corroborate the morphological identification of individuals collected in the field.

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

Sampling scheme name: Commercial sampling on Shore

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.

Sampling scheme name (or identifier): ShoreComTripallsp

Additional information on sampling schemes

Onshore sampling is carried out by scientific observers in the métiers of small-scale fisheries (GNS_DEF, GTR_DEF, LLS_DEF, FPO_DEF, LLD_LPF). Onshore sampling is mainly used for those segments of the SSF fleet that cannot accept observers on board either because of their small vessel size (0-6) or because they carry out multi-day trips (e.g. LLD) and cannot accommodate observers on board. Of the total number of sampling trips, 30% are carried out on shore (SciObsOnShore).

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

NA

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

Text Box 2.6: Research surveys at sea

Region: Mediterranean and Black Sea

Research survey: International bottom trawl survey in the Mediterranean (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.

Research survey: MEDITS

RWP Mediterranean and Black Sea implementation years: 2025-2027

The regionally agreed research survey MEDITS is described in the RWP Mediterranean and Black Sea 2025-27. Greece participates in all the activities described in the RWP. Some national specific activities carried out by MS are described below:

During the MEDITS survey, additional samples for biological variables will be collected for the fish, cephalopod and crustacean species listed in Table 2.2 of this WP. Stomach samples of the species *Merluccius merluccius* will also be collected during the MEDITS survey in all Greek GSAs (20,22,23) for stomach content analysis. Stomachs samples of *Lophius* spp. (non-binding activity) may also be collected during the MEDITS survey in GSAs 20, 22 and 23, if feasible.

(max 450 words per survey)

Research survey: Pan-Mediterranean Acoustic 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.

Research survey: MEDIAS

RWP Mediterranean and Black Sea implementation years: 2025-2027

The regionally agreed research survey MEDIAS is described in the RWP Mediterranean and Black Sea 2025-27. Greece participates in all the activities described in the RWP. Some national specific activities carried out by MS are described below:

The MEDIAS survey programme evaluates the abundance and spatial distribution of anchovy and sardine resources by direct methods (acoustics), independently of the data provided by commercial fisheries in GSAs 22 and 20. In GSA 22 the survey is conducted in the summer period of the year according to MEDIAS protocol since 2008. In GSA 20 the survey is conducted in the early autumn period of the year according to the MEDIAS protocol since 2013. Gaps in this timeseries were encountered due to the research vessel availability (i.e. research vessel reconstruction, research vessel malfunction).

A specific date for each GSA has been proposed by the MEDIAS coordination group during 2024, based on the historical periods of the surveys and the availability of research vessels. For GSA 22 the official period is months 6, 7 and for GSA 20 is months 9, 10. A buffer period of plus or minus one month is authorized in case of particular difficulties that may be encountered in certain years, as occurred in the past in GSA22. In the future, in case that the survey has to be brought forward or delayed by more than this buffer month outside the official period, a request will first be made to MEDIAS SC and the EC before launching the survey.

Starting from 2025, eggs and mesozooplankton data will be collected at national level.

Sampling of plankton scattering layers using plankton nets could facilitate echogram interpretation by providing a ground truth of some targets in the acoustic data, so that, during the acoustic processing, these targets could be discarded with a higher degree of certainty, while separating the small pelagic fish echoes from unwanted plankton echoes. The accuracy of this process could be further enhanced through the knowledge of the kind of planktonic organisms that are prevalent in a certain area. Plankton and eggs sampling are also important because of the potential relationships between acoustic surveys and anchovy stock assessments. Finally, by knowing plankton abundance it is possible to have an index of productivity, and thus prey availability, that is important in the study of small pelagic fish abundance over the years and of their spatial distribution; this ecosystem indicator could also be important in the Marine Strategy Framework Directive.

Eggs and mesozooplankton data based on vertical plankton hauls will be collected in predefined sampling stations and in parallel to acoustic sampling. A proper number of stations (depending on transect length and taking into account the position of existing CTD stations), will be performed along the existing transects in order to collect information on meso-zooplankton and eggs with an appropriate resolution. Samples processing will be in accordance to the procedures followed by the other MS in the MEDIAS scientific group. Harmonized method for collecting and analysing mesozooplankton and egg samples will be defined in the next MEDIAS SC meeting and included in the updated MEDIAS handbook for reference.

(max 450 words per survey)

SECTION 3 : FISHING ACTIVITY DATA

Text Box 3.1: Fishing activity variables data collection strategy

Region: Mediterranean and Black Sea

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

Greece has imposed stricter measures with regard to the Control Regulation. In particular, as far as article 15 of the Control Regulation is concerned, Greek vessels from 12 metres LOA and above, are obliged to report their landings daily through the Electronic Reporting System (ERS) and their effort through Vessel Monitoring System (VMS).

Vessels between 10 m and 12 m LOA are obliged to report their landings daily through the ERS, however regarding their effort only the vessels that have a special authorisation are obliged to install a VMS device and consequently to report their effort.

Vessels with a LOA of less than 10 m are not obliged for electronic reporting of their landing or effort unless they have a special authorisation. With the revision of the Control Regulation, all vessels, regardless of their LOA, will gradually install both ERS and VMS type devices by 2030.

All fishing vessels, with no obligation for electronic reporting submit their landings, in a monthly basis, through the Integrated Monitoring System of Fisheries Activities (OSPA) of the Ministry of Rural Development and Food, since 2018.

For the validation of those data, fishing effort and landings data for vessels with no electronic reporting obligation, are estimated through complementary data collection methods, including random sampling and

face-to-face interviews using structured questionnaires. Biological sampling data are also collected, as recommended in MARE/2014/19.

In addition, for vessels >10m, some variables and fleet segments are validated through probability sample surveys to ensure accuracy. This validation is necessary because there are still errors in reported species names, landings, catch weight, and values. These issues could affect the reliability of the data. The validation process focuses on the variables: Value of landings total and per commercial species; Live Weight of landings total and per species; days at sea; number of trips; and average price per species, and it is applied to the following fleet segments: “Vessels using hooks 12-18m” and “Vessels using drift and/or fixed netters 12-18m”.

For the large-scale fisheries, namely demersal trawlers and purse seiners (DTSV1824; DTSVL2440; PSVL1218; PSVL1824; PSVL2440), a validation process was carried out during the previous programming period to assess the data collected by the large-scale fisheries through the Electronic Reporting System (ERS). The results confirmed the validity of the ERS data. Therefore, there is no need for a supplementary data collection for large-scale fisheries.

Regarding the capacity variables, the data collection scheme is census, and therefore, the MS did not include capacity variables in the Table 3.1. However, as control regulation is not yet applied horizontally to all fishing vessels, the capacity variables for the segments: “Inactive vessels 0-6m” and “Inactive vessels 6-12m” are estimated after 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 1.2). 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). 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”. For larger inactive vessels (length classes: 12-18m, 18-24m, and 24-40m), those that are listed in the Fleet Registry and report catch and effort in ERS are considered active, while vessels with no ERS records are classified as inactive.

For more detailed information on the planning and methodology, please refer to Annex 1.2.

(max. 900 words)

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

Region: Mediterranean and Black Sea

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.

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.

SECTION 4: IMPACT OF FISHERIES ON MARINE BIOLOGICAL RESOURCES

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.

Incidental bycatch of sensitive (Protected, Endangered and Threatened–PET species) will be recorded through the SciObsAtSea observation type (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 different gear types/metiers has not yet been undertaken. According to recommendation 4 of the RCG Med&BS 2021, a joint RCG Med&BS and STREAMLINE workshop on the data needed to assess the impact of fisheries on the marine ecosystem was planned for 2022, and one of the follow-up actions was to identify high-risk metiers by species group for by-catch monitoring, taking into account the results of pilot studies. The workshop did not take place due to the pandemic situation.

- 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 results of the three-year pilot study on the level of fishing and the impact of fisheries on biological resources and marine ecosystems, carried out by Greece from 2018 to 2020 in GSAs 20, 22 and 23, the selected metiers for which PET data should be recorded are: 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). Greece has already integrated the PETS data collection into the above-mentioned metiers from 2022 and will continue to do so in the new WP period 2025-2027.

- What methods are used 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 Coordination 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:

In the new sampling period 2025-2027, the existing sampling scheme has been extended by allocating an additional 152 on-board fishing trips to small-scale fisheries metiers (see Table 2.5), in order to improve the coverage of the SSF fleet and also to support the objectives of the EU Marine Action Plan for data collection on by-catches of sensitive species, as four of the five metiers monitored for PETS belong to the SSF.

Additional description on sampling frames

NA

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

Text Box 4.3: Fisheries impact on marine habitats

Region: Mediterranean and Black Sea

Study: Regional coordination on fish stomach contents collection and analysis in the Med&BS

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.

Name of the study: Regional coordination on fish stomach contents collection and analysis in the Med&BS

RWP Mediterranean and Black Sea implementation years: 2025-2027

All information on the regional coordination for the collection and analysis of fish stomach contents is described in the Mediterranean and Black Sea RWP 2025-27. Greece participates in the activities described in the RWP. Specifically, the species *Merluccius merluccius* will be sampled for stomach collection in GSA 20 & GSA 22 and, if feasible, in GSA 23. If feasible, stomachs of *Lophius* spp. may also be sampled in GSAs 20, 22 and 23.

(max 250 words per study)

Study: Fishing footprint of small-scale fisheries 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.

Name of the study: Fishing footprint of small-scale fisheries on marine habitats

1. Aim of the study

In the Mediterranean and Black Sea, the majority of small-scale fishing vessels are boats less than 12 meters in length and typically lack monitoring equipment. As a result, the spatial distribution of fishing effort is currently unknown for these vessels. This study aims to contribute to the estimation of the footprint of small-scale fisheries (SSF) in GSAs 20, 22, and 23 through a Multi-Criteria Decision Analysis (MCDA) approach. By means of MCDA conducted through a stepwise procedure, the potential spatial fishing effort, landings' weight and value for certain species can be derived. The method provides an innovative and cost-effective way to assess the impact of the, notoriously hard to assess, small-scale fishing fleet. It was further considered how the inclusion of several environmental and human data, could provide the background needed to estimate the potential fishing footprint of small-scale fisheries. The above can contribute to more holistic management approaches that consider the impacts of all fishing gears, with the ultimate aim of achieving sustainability of fish stocks, and supports the Marine Action Plan in terms of data collection on the impacts of fisheries on marine habitats.

2. Duration of the study

2025-2027

3. Methodology and expected outcomes of the study

Initially, the MCDA generates a proxy of fishing effort by considering various interactions with human activities and environmental factors (Kavadas et al., 2015, <https://doi.org/10.12681/mms.1087>). This method has been currently expanded to incorporate spatiotemporal environmental variables (such as weather conditions and primary productivity), species distribution along with fishing effort and landings data from EU Fisheries

Dependent Information (FDI) datasets (Tables A and G). By integrating this additional information, the MCDA can generate fishing effort and landings in the format of FDI tables H (landings by rectangle) and I (effort by rectangle) by GSA, quarter, length category and gear type (gillnets-GNS, trammel nets-GTR, and longlines-LLS). This method has been implemented in an R package and integrated into the FWC Med&BS study's RDBFIS II, streamlining the processes described above. A key innovation of this approach is its ability to estimate spatial fishing effort, spatial landing weight, and value by species in the FDI format. Notably, it extends these capabilities to small-scale fishing vessels (<12m), which typically lack VMS/AIS data, thereby addressing a critical gap in previous assessments. The tool is openly available for use by any Member State, though its integration into the RDBFIS II does not impose mandatory adoption. For the period 2025-2027, the proposed method will be applied for small-scale fisheries (SSF) in GSAs 20, 22, and 23. *(max 900 words per study)*

SECTION 5: ECONOMIC AND SOCIAL DATA IN FISHERIES

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.

RWP ECON implementation years: 2025-2027

1. Description of clustering

Table 5.2.1 shows the fleet segments with less than ten vessels merged with other segments to design the sampling plan and to report economic variables. In all cases, the merged segments 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.

Table 5.2.1: The clustering scheme of Greek fleet segments (based on the Fleet Registry retrieved from the EU on September 30th, 2024)

	Merged segment(s)		Clustered segment		Nr of vessels after clustering (cluster name in parenthesis)
	Length Class	Nr of Vessels	Length Class	Nr of Vessels	
DFN	VL1824	2	VL1218	165	167 (DFNVL1218*)
DTS	VL1218	3	VL1824	88	91 (DTSVL1824*)
FPO	VL1218	9	VL0612	290	299 (PFOVL0612*)
HOK	VL1824	7	VL1218	96	103 (HOKVL1218*)
PS	VL0612	1	VL1218	76	77 (PSVL1218*)
DRB	VL0006	7	VL0612	31	39 (DRBVL0612*)
	VL1218	1			

2. Description of activity indicator

Not Applicable

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

No deviations exist

(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.

RWP ECON implementation years: 2025-2027.

1. Description of the threshold application

According to EUROSTAT, for 2022, Greece was responsible for 13.0% of the EU's total output volume in the aquaculture sector.

The data collection will include the following four segments in percentage of the total Greek aquaculture production volume:

Seabass – seabream = 82.86%

Mussels=10.5%

Trout=1.9%

Freshwater fish=1.4%

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

There are no deviations

(max. 900 words)

SECTION 7: ECONOMIC AND SOCIAL DATA IN FISH PROCESSING

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.

RWP ECON implementation years:2025-2027.

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 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 2022, the number of companies with 0-10 employees that participated in the survey number was 136 in a total of 181 companies with fish processing activities in Greece (75%).
- Regarding the social data, the fish processing data survey program will collect, 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 the following 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

There are no deviations

(max. 900 words)

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

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

Related to Table 2.3 and Text Box 2.3 (diadromous data collection)

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: 2025-2027
Short description (max 100 words): The biological data, such as length and weight of yellow eel, will be collected from samplings in lagoons in different EMU every year. The sampling will be carried out using fyke nets, placed consecutively (20 sets of fyke nets, 100 m total length) in random stations in selected lagoons, trying to cover the whole area of the lagoon. At least six (6) samplings trips will be conducted per, depending on the weather conditions. RWP XXX implementation years: There is no RWP for diadromous species data collection in freshwater
Description of the population
Population targeted: Yellow eel's samples will be collected using fyke nets. The samplings will be carried out in one river basin within a different EMU annually, completing 6 sampling trips in total. The samplings will be conducted outside the migration period (January - February) and the high-temperature period (July - October). Additionally, on windy days (5-7 Beaufort) that prevent sampling by boat in the lagoons, the planned sampling will be reschedule on the next available day, without exiting a three-day period. Population sampled: Samplings will be focused on catching yellow eels in different EMU every year. Stratification: 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, the availability of existing data, a total of 6 sampling trips will be conducted in each EMU's study lagoons. Eels caught in the fyke nets will be anesthetized using a solution of Eugenol (1.5 ml/10 ml water), then the biological measurements will be recorded (body length & weight, fin length & eye diameter). After the measurements are taken the eels will be released back into the lagoon to minimize mortality within the standing population. For the WP 2025-2027, yellow eel samplings will begin in EMU 1 for 2025, continues in EMU for 2026 and in EMU 3 for 2027.

Sampling design and protocols
Sampling design description: 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 of each lagoon. The fyke nets will remain in the lagoon for one week and in each sampling the gear will be deployed at different positions to ensure coverage of the entire lagoon/lake area. The captured yellow eels will be anesthetized using solution of Eugenol (1.5 ml/10 ml water), then the biological measurements will be recorded (body length & weight, fin length & eye diameter). After the measurements are taken the eels will be released back into the lagoon to minimize mortality within the standing population Is the sampling design compliant with the 4S principle? NA Regional coordination: 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: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE Eel Methodology-data QAF 2020.pdf Compliance with international recommendations: Y Link to sampling protocol documentation: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE Eel Methodology-data QAF 2020.pdf Protocol follows international recommendations: Y
Sampling implementation
Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: Samplings depend on the availability of the fisherman and the weather. In cases where the sampling cannot be performed, new samplings will be rescheduled for the next available day, without exiting three days period.
Data capture
Means of data capture: Biological parameters for silver eel From each individual, the following parameters will be 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. the body weight, using a digital precision scale (± 0.1 gr)
3. the diameter of the eye, using a precision digital calliper (± 0.01 mm)
4. the fin length, using a precision digital calliper (± 0.01 mm)

After measurements, the captured eels will be released into the lagoon.

Based on existing age and length data from previous years, efforts will be made to develop a suitable function, following the methodology proposed by Ailloud & Hoenig (2019) with the appropriate modifications or any other available methodologies for European eel, to estimate the age structure of the eel population, using only new length data. This methodology will be implemented in the specimens in the following years.

Data capture documentation:

- Ailloud, L.E. and Hoenig, J. M. (2019) A general theory of age-length keys: combining the forward and inverse keys to estimate age composition from incomplete data (2019). ICES Journal of Marine Science, 76(6), 1515-1523
- Durif, C., S. Dufour, and P. Elie. 2005. The silvering process of *Anguilla anguilla*: a new classification from the yellow resident to the silver migrating stage. Journal of Fish Biology 66:1025–1043.
- Durif, C., A. Guibert, and P. Elie. 2009. Morphological discrimination of the silvering stages of the European Eel. Pages 103–111 in J. M. Casselman and D. K. Cairns, editors. Eels at the edge: science, status, and conservation concerns. American Fisheries Society, Symposium 58, Bethesda, Maryland.
- Höhne L., Pohlmann J, Freese M. (2023) Minimally Invasive Collection of Biometric Data Including Maturation Stage on European Eel Using Photography, Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 15:e10239, 2023 <https://doi.org/10.1002/mcf2.10239>

Quality checks documentation:

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:

Database of the Fisheries Research Institute (FRI)

International database:

NA

Quality checks and data validation documentation:

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

Sample storage
Storage description: NA. Sample analysis To minimize mortality within the eel stock, given the critical status of eel populations and the availability of existing data, non-lethal methods will be performed to collect biological variables. The age determination will be performed using specific age/length functions for each lagoon.
Data processing
Evaluation of data accuracy (bias and precision): 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: 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: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE Eel Methodology-data QAF_2020.pdf Validation of the final dataset: National SQL Database - expert validation

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:2025-2027
Short description (max 100 words):

The biological data on length and weight for silver eels (descending eels), will be collected from the commercial fisheries in lagoons, on site in different EMU every year. Specifically, the samples will be collected from the permanent installed fishing traps in the channel connecting the lagoons with the sea that are operated by Fishing cooperatives. The captured silver eels will be anesthetized using solution of Eugenol (1.5 ml/10 ml water), then the biological measurements will be recorded (body length & weight, fin length & eye diameter). After the measurements are taken the eels will be released back into the sea to continue their breeding migration. In collaboration with the Fishing Cooperatives, a total of 50 samples will be collected annually from different EMU, with the appropriate number of eels gathered during 8 sampling trips (one per week during the migration period January- February). To minimize mortality rates within the migrant population, non-lethal methods will be performed to collect biological variables

RWP XXX implementation years: There is no RWP for diadromous species data collection in freshwater

Description of the population

Population targeted:

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

Sampling will be focused on catching silver eels in different EMU every year.

Stratification:

This methodology is spatially stratified based on the assessment of all EMUs', where eels are present, in a three-year period. All data for length and will be collected in the field from 50 samples annually from different EMU. After measurements are taken, the silver eels will be released back into the sea to continue their spawning migration. Non-lethal methods will be employed, such as applying age/length functions specific to the lagoon, to gather additional biological data, including age and sex.

For the WP 2025-2027, silver eel samplings will begin in EMU1 for 2025, continues in EMU2 for 2026 and in EMU3 for 2027.

Sampling design and protocols

Sampling design description:

All the data for silver eels will be collected using samples from the commercial fisheries in lagoons, from each EMU. As it is well known, eel fisheries in Greece are only allowed to be performed in lagoons by 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.

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

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: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE Eel Methodology-data QAF 2020.pdf Compliance with international recommendations: Y Link to sampling protocol documentation: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE Eel Methodology-data QAF 2020.pdf Compliance with international recommendations: Y
Sampling implementation
Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: The samplings of silver eels monitoring depend on the period of fisheries allowance
Data capture
Means of data capture: Biological parameters for silver eel From each individual, the following parameters will be 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. the 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 calliper (± 0.01mm) Based on existing age and length data from previous years, efforts will be made to develop a suitable function, following the methodology proposed by Ailloud & Hoenig (2019) with the appropriate modifications or any other available methodologies for European eel, to estimate the age structure of the eel population, using only new length data. This methodology will be implemented in the specimens in the following years. After measurements, the captured eels will be released back into the sea to begin their migration. Data capture documentation: • Ailloud, L.E. and Hoenig, J. M. (2019) A general theory of age-length keys: combining the forward and inverse keys to estimate age composition from incomplete data (2019). ICES Journal of Marine Science, 76(6), 1515-1523

• Durif, C., S. Dufour, and P. Elie. 2005. The silvering process of <i>Anguillaanguilla</i>: a new classification from the yellow resident to the silvermigrating stage. <i>Journal of Fish Biology</i> 66:1025–1043. • Durif, C., A. Guibert, and P. Elie. 2009. Morphological discrimination of the silvering stages of the European Eel. Pages 103–111 in J. M. Casselman and D. K. Cairns, editors. <i>Eels at the edge: science, status, and conservation concerns</i>. American Fisheries Society, Symposium 58, Bethesda, Maryland. • Höhne L., Pohlmann J, Freese M. (2023) Minimally Invasive Collection of Biometric Data Including Maturation Stage on European Eel Using Photography, <i>Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science</i> 15:e10239, 2023 https://doi.org/10.1002/mcf2.10239 Quality checks documentation: Y
Data storage
National database: Database of the Fisheries Research Institute (FRI) International database: NA Quality checks and data validation documentation: All the biological data are subject to various quality checks, with main purpose to detect missing data, outliers and misprints.
Sample storage
Storage description: NA. Sample analysis To minimize mortality within the eel stock, given the critical status of eel populations and the availability of existing data, non-lethal methods will be performed to collect biological variables. The age determination will be performed using specific age/length functions for each lagoon.
Data processing
Evaluation of data accuracy (bias and precision): 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: 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:

http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/GREECE_Eel_Methodology-data_QAF_2020.pdf

Validation of the final dataset:

National SQL Database - expert validation.

Related to Table 2.4 and Text Box 2.4 (recreational fisheries data collection)

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: 2025-2025
Short description (max 100 words): The offsite survey has two components that are complementary to each other, since they address the same stratified population, namely a) the telephone survey, b) the internet site and the mobile application. The SelfOnShore triennial telephone 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 2026 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 SelfOnShore annual survey will be conducted as an additive off-site self-reporting tool. The off-site survey related to self-reporting uses a specially dedicated internet site https://erasitexniki.inale.gr/ (fig. 1) and a mobile application under the name GRecFish (fig. 2) that was made for Android, iOS and Microsoft mobile telephones and can be found in relevant play stores. Both the site and the app are mirrored and in order to use each one of them, the user must register. The protocols used inside to record fishing trip details are similar to the one used for the on-site survey, adapted to a digital form.

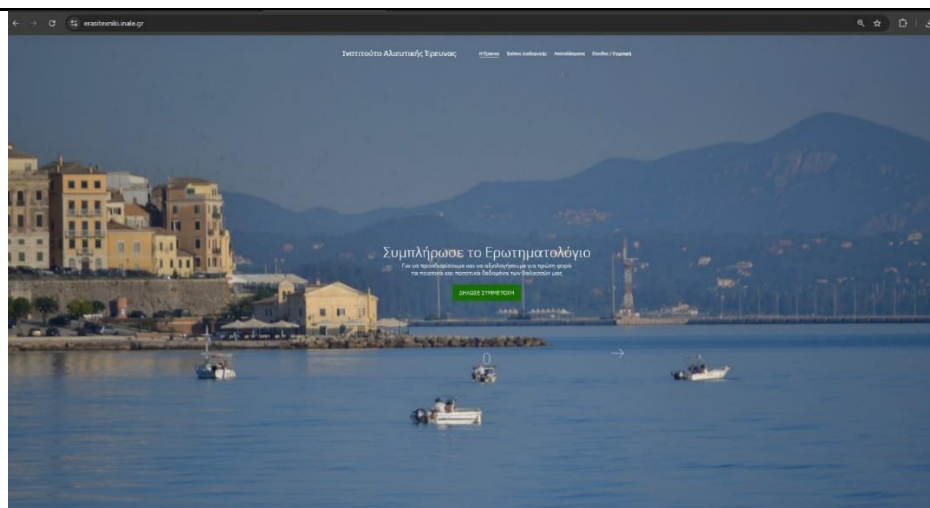


Figure 1. Website front page part of the Greek annual off-site self-reporting tool (<https://erasitexniki.inale.gr>).

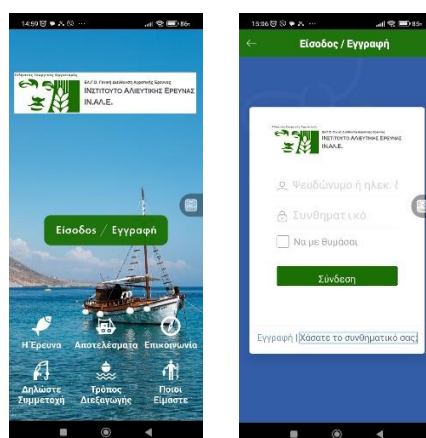


Figure 2. Application GRecFish front and entry page, part of the Greek annual off-site self-reporting tool (android and ios) available in relevant play stores.

RWP Mediterranean and Black Sea, implementation years:2025-2027

In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.

Description of the population

Population targeted:

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:

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 2026, 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:

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:

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.

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 relevant app (GRecFish) 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?

NA

Regional coordination:

Sampling design and protocols used in the implementation of recreational fishery sampling in GRC during 2025-2027 will follow the provisions of RWP 2025-2027 that was prepared by RCG Med &BS to be implemented in the Mediterranean and Black Seas.

Link to sampling design documentation:

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Design follows international recommendations:

Y

Link to sampling protocol documentation:

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within 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.

Regarding the self-reporting tools (site & app) they are going to be monitored and checked weekly for new entries.

Data capture

Means of data capture: The telephone survey is a quantitative research method, following the Computer Assisted telephone interviews (CATI) approach and using a structured questionnaire. Data capture documentation https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf Quality checks documentation: Y https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf
Data storage
National database: 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: NA Quality checks and data validation documentation: https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf
Sample storage
Storage description: NA Sample analysis NA
Data processing
Evaluation of data accuracy (bias and precision): Y https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf Editing and imputation methods: Y

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Quality document associated to a dataset:

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Validation of the final dataset:

The final datasets are 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.

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: 2025-2027
Short description (max 100 words) 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. RWP Mediterranean and Black Sea, implementation years:2025-2027 In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.
Description of the population
Population targeted: 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:

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 2025-27 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:

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:**

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%202013/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?

NA

Regional coordination:

Sampling design and protocols used in the implementation of recreational fishery sampling in GRC during 2025-2027 will follow the provisions of RWP 2025-2027 that was prepared by RCG Med&BS to be implemented in the Mediterranean and Black Seas.

Link to sampling design documentation:

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Design follows international recommendations: Y

Y

Link to sampling protocol documentation:

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within 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:

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 : https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf Quality checks documentation: Y https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf 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%202013/WGRFS%20Report%202013.pdf
Data storage
National database: 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: NA Quality checks and data validation documentation: https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf
Sample storage
Storage description: NA Sample analysis NA
Data processing
Evaluation of data accuracy (bias and precision): Y https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf Editing and imputation methods: Y

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.pdf

Quality document associated to a dataset:?

https://inale.gr/wp-content/uploads/2023/05/Methodology-and-Data-Quality-Assurance-Framework-for-Recreational-Fishery_2023_22-5-2023.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, 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%202013/WGRFS%20Report%202013.pdf>

Related to Table 2.1, 2.2, 2.5 and Text Box 2.5, 4.2 (biological specific data collection, commercial fisheries data collection)

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: 2025-2027
Short description (max 100 words): 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.

RWP Mediterranean and Black Sea, implementation years:2025-2027. The regional coordination of sampling plan for biological data is under development in the RCG Med&BS ISSG on sampling optimization.

In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.

Description of the population

Population targeted:

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:

The population to be sampled is the fishing trips of vessels operating in selected métiers. The ranking system described in Commission Decision 2010/93/EU at level 6 is used to identify the métiers to be sampled. The métiers are ranked according to their share of total commercial landings, total value and total effort in days at sea until a cut-off level of 90% is reached. All the métiers in the top 90% of each variable (effort, landings, value) are selected for sampling. For the WP 2025-2027 the ranking was based on average landings, value and effort over the years 2021-2023, 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 bottom otter trawl for mixed demersal and deep-sea species (OTB_MDD_>=40_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 should be stressed that total landings and effort data are collected for each metier of the Greek fishing fleet.

Stratification:

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 **8 different métiers** sampled (the selected 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:

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 (Deliverables 2.5 and 4.2), which implement 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 evaluation 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 be sampled) disaggregated over strata (e.g. quarters and métiers).

For the selection of sampling trips within each stratum, Simple Random Sampling with Replacement is applied, using a list of vessels that were operated in each GSA and in each métier during the previous year. 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.

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

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:

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

Link to sampling design documentation:

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

Design follows international recommendations:

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:

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

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

N

We are in the process of implementing a workflow to collect and analyse data on sample refusals by fishermen in order to estimate the refusal rate.

Monitoring of sampling progress within 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:

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:

- 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.

Quality checks documentation:

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 • Qualitrain project. Quality check packages available at github folder https://github.com/COISPA/RDBgc
Data storage
National database: 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: RDBFIS will be used when it will be fully functionable Quality checks and data validation documentation: 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: 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: • 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): 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:**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:

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:

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.

Sampling scheme identifier: ShoreComTripallsp

MS : GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: ShoreComTripallsp
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2025-2027
Short description (max 100 words): 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 métiers of small-scale fishery using passive gears, by scientific observers.

RWP Mediterranean and Black Sea, implementation years:2025-2027. The regional coordination of sampling plan for biological data is under development in the RCG Med&BS ISSG on sampling optimization

In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.

Description of the population

Population targeted:

The Primary Sampling Unit (PSU) is the fishing trip. The Target Population is all fishing trips conducted by all commercial vessels of the Greek Small-Scale Fishing (SSF) fleet using passive gear per GSA for the reference years. The data source is the official national fleet register and the DCF data collection system in the reference years.

Population sampled:

The population sampled by the on-shore sampling scheme is the fishing trips of the vessels of the small-scale fishing fleet using passive gears and operating in selected métiers. The reason for applying this sampling scheme to the aforementioned métiers, is that they are often fished by small vessels that are not suitable for on-board sampling. Consequently, if only the SeaComTripallsp sampling scheme were to be applied to this part of the fleet, a significant part of it would be naturally excluded from 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 métier that it was not selected by the ranking process.

Stratification:

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:

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 be sampled) disaggregated over strata (e.g. quarters and métiers).

For the selection of the sampling trips within each stratum, Simple Random Sampling with Replacement is applied. The species for which length is 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

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:

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

Link to sampling design documentation:

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

Design follows international recommendations:

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:

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).

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

N

We are in the process of implementing a workflow to collect and analyse data on sample refusals by fishermen in order to estimate the refusal rate.

Monitoring of sampling progress within the sampling year:

The sampling progress is monitored and checked 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 métier is not reached, the obligation is transferred to the next quarter.

Data capture
Means of data capture: 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: GFCM, 2018. GFCM Data Collection Reference Framework (DCRF). Quality checks documentation: Y - GFCM, 2018. GFCM Data Collection Reference Framework (DCRF). - Qualitrain project. Quality check packages available at github folder https://github.com/COISPA/RDBgc
Data storage
National database: 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: RDBFIS will be used when it will be fully functionable Quality checks and data validation documentation: https://inale.gr/wp-content/uploads/2022/05/GREECE_Sampling_Scheme_Data_Quality_25_5_2022.pdf
Sample storage
Storage description: NA This sampling plan does not include samples to be stored Sample analysis: NA
Data processing
Evaluation of data accuracy (bias and precision): 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:

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:

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:

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.

Related to Table 2.6 and Text Box 2.6 (research surveys at sea)

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: 2025-2027

Short description (max 100 words):

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.
- Collect eggs and mesozooplankton data based on vertical plankton hauls in predefined sampling stations in parallel to acoustic sampling.

RWP Mediterranean and Black Sea, implementation years:2025-2027

In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.

Description of the population

Population targeted

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:

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 takes place from September to October aiming to capture the recruitment period of anchovy.

Stratification:

No stratification is taking place.

Sampling design and protocols

Sampling design description:

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. For mesozooplankton and egg samples a proper number of stations (depending on transect length) will be performed along dedicated transects in order to collect information on meso-zooplankton and eggs with an appropriate resolution. Samples processing will be in accordance to the procedures followed by the other MS in the MEDIAS scientific group.

Is the sampling design compliant with the 4S principle?

NA Regional coordination: 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: 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) Harmonized method for collecting and analysing mesozooplankton and egg samples will be defined in the next MEDIAS SC meeting and included in the updated MEDIAS handbook. Design follows international recommendations: Y Link to sampling protocol documentation: MEDIAS updated handbook can be found at http://www.medias-project.eu/medias/website/handbooks-menu.html Harmonized method for collecting and analysing mesozooplankton and egg samples will be defined in the next MEDIAS SC meeting and included in the updated MEDIAS handbook. Protocol follows international recommendations: Y The survey is in compliance with the MEDIAS handbook and the sampling protocol described therein
Sampling implementation
Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: 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.

For mesozooplankton and egg samples a proper number of stations (depending on transect length) will be performed along dedicated transects in order to collect information on meso-zooplankton and eggs with an appropriate resolution. Samples processing will be in accordance to the procedures followed by the other MS in the MEDIAS scientific group. Harmonized method for collecting and analysing mesozooplankton and egg samples will be defined in the next MEDIAS SC meeting and included in the updated MEDIAS handbook.

Data capture documentation:

- 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:

Y

-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:

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:

NA

An international database is in progress within the RDBFIS project that will be hosted by HCMR.

Quality checks and data validation documentation:

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.

Mesozooplankton and egg abundance estimates will be subjected to quality checks in accordance to the procedures followed by the other MS in the MEDIAS scientific group.

Sample storage

Storage description:

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.

Mesozooplankton and egg samples will be stored in formalin and in accordance to the procedures followed by the other MS in the MEDIAS scientific group.

Sample analysis:

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>).

Harmonized method for collecting and analysing mesozooplankton and egg samples will be defined in the next MEDIAS SC meeting and included in the updated MEDIAS handbook.

Data processing**Evaluation of data accuracy (bias and precision):**

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:

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. Harmonized method for mesozooplankton and egg data processing will be defined in the next MEDIAS SC meeting and included in the updated MEDIAS handbook.

Quality document associated to a dataset:

Not available

Validation of the final dataset:

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

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: 2025-2027
Short description (max 100 words): The primary objective of the MEDITS survey is to assess the abundance, biomass and distribution of the stocks and to monitor changes in them, to describe the demographic structure of the demersal megafauna community and to collect biological data for certain species listed in Table 2.2 of the NWP, as well as abiotic parameters and stomach samples of <i>Merluccius merluccius</i> (binding activity) and, where possible, <i>Lophius spp</i> (non-binding activity) for stomach content analysis. Further details are available at: http://www.sibm.it/MEDITS_2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf RWP Mediterranean and Black Sea, implementation years:2025-2027 In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.
Description of the population
Population targeted: <u>PSU</u>: fish haul <u>Main target species</u>: MEDITS reference list of target species that includes 82 demersal species (fishes, crustaceans and cephalopods), 32 of them are elasmobranchs <u>Main survey area</u>: GSAs 20,22,23 (E. Ionian, Aegean and Cretan Seas) Population sampled: MEDITS reference list of target species that includes 82 demersal species, 32 of them are elasmobranchs (Annex VI of MEDITS handbook v.9, 2017) and species listed in Table 2.2 of the NWP. Stratification: 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: Depth stratified sampling for demersal fish communities Is the sampling design compliant with the 4S principle? NA Regional coordination: No regional coordination among MS is taking place. The survey is coordinated by the MEDITS Steering Committee. 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.

Link to sampling design documentation: http://www.sibm.it/MEDITS_2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf Design follows international recommendations: Y Link to sampling protocol documentation: http://www.sibm.it/MEDITS_2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf Protocol follows international recommendations: Y The survey is in compliance with the MEDITS handbook and the sampling protocol described therein.
Sampling implementation
Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: 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. For more information see relevant section of MEDITS Handbook http://www.sibm.it/MEDITS_2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf Data capture documentation: http://www.sibm.it/MEDITS_2011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf Quality checks documentation: Y RoME software https://www.sibm.it/MEDITS%202011/new/RoME_April_2019/RoME%201.4%20User%20Manual%20-%202019.pdf
Data storage
National database: The relevant data are stored in the FRI and HCMR local databases, that feed the National Data Base.

International database:

NA

An international database is in progress within the RDBFIS project that will be hosted by HCMR.

Quality checks and data validation documentation:

The ROME software

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

Sample storage**Storage description:**

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: 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):**

Y

Editing and imputation methods:

The methodology used is described in the MEDIAS protocol

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

Quality document associated to a dataset:

Not available

Validation of the final dataset:

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

Related to Table 4.1 (stomach sampling)

Sampling scheme identifier: MEDITS_Stomach

MS: GRC
Region: Mediterranean and Black Sea
Sampling scheme identifier: MEDITS_Stomach
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea
Time period of validity: 2025-2027
Short description (max 100 words): Following the provisions of RCG Med&BS Regional Work Plan on data collection in the fisheries and aquaculture sectors - 2025-2027, v. 5.3 (RCG Med&BS 2024) (hereafter RWP 2025-2027), the stomachs sampling scheme that will be used in GRC during 2025-2027 is aiming mainly at collecting <i>Merluccius merluccius</i> stomachs during the MEDITS scientific survey (binding activity). The sampling scheme covers mainly GSA 20 (Eastern Ionian Sea) & GSA 22 (Aegean Sea). However, if feasible, <i>M. merluccius</i> stomachs may also be collected in MEDITS in GSA 23 (Crete). If feasible, <i>M. merluccius</i> stomachs sampling may also be carried out in commercial fishing trips samplings in GSAs 20, 22 and 23 (non-binding activity). Additionally, <i>Lophius</i> spp. stomachs samples (non-binding activity) may also be collected during the MEDITS survey and commercial fishing trips samplings in GSAs 20, 22 and 23, if feasible. Stomachs sampling and analysis in GSA 22 will be carried out by the Fisheries Research Institute (FRI), while in GSAs 20 and 23 by the Hellenic Centre for Marine Research (HCMR). RWP Mediterranean and Black Sea implementation years: 2025-2027. In the RWP Med & BS there are no annexes, thus no quality documents are provided. Therefore, the MS provides the quality document in the NWP.
Description of the population
Population targeted: Following the provisions of RWP 2025-2027, <i>M. merluccius</i> populations in GSA 20 & GSA 22 and, if feasible also in GSA 23, will be targeted for stomachs sampling and analysis. If feasible, <i>Lophius</i> spp. may also be targeted for stomachs sampling and analysis in the same GSAs. REFERENCES: RCG Med&BS (2024). Regional Work Plan on data collection in the fisheries and aquaculture sectors - 2025-2027, v. 5.3. Paris, 30 August 2024. Population sampled: <i>Merluccius merluccius</i> populations in GSA 20 & GSA 22 and, if feasible, in GSA 23, will be sampled for the collection of stomachs. If feasible, <i>Lophius</i> spp. stomachs may also be sampled in GSAs 20, 22 and 23. Stratification: The European hake (<i>M. merluccius</i>) is a 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 deep (Whitehead et al. 1986). Anglerfishes

are bathydemersal species with depth ranges 20 – 1000 m (*Lophius piscatorius*) and 70 – 1013 m (*Lophius budegassa*) (Froese and Pauly 2024).

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.

Froese and Pauly (2024). FishBase. Available at <https://fishbase.org>. Accessed 9/10/2024

Sampling design and protocols

Sampling design description:

GRC will align the sampling methodology for the collection of stomachs to the provisions of RWP 2025-2027 and the recommendations of the MARE/2016/22 STREAM project (RCG-Med&BS 2019) as follows:

For *M. merluccius*, the samples will be collected mainly during the annual MEDITS bottom trawl scientific survey (quarters 2, 3). If feasible, additional *M. merluccius* stomachs may also be collected during the biological sampling of commercial fisheries (quarters 1, 2, 3, 4). A minimum of 70 full stomachs will be sampled for *M. merluccius* in MEDITS in GSAs 20 and 22 per year. If feasible, a minimum of 20 additional *M. merluccius* stomachs will be collected in MEDITS in GSA 23 per year. The minimum number of stomachs that may be collected per year during the biological sampling of commercial fisheries is 30 stomachs in GSAs 20 and 22, and 18 stomachs in GSA 23. The stomach numbers will be distributed across the three life stages/size classes defined for the species in the recommendations of the STREAM project, i.e., i) juveniles (<20 cm TL); ii) sub-adults (20-35 cm TL) and iii) adults (>35 cm TL).

For *Lophius spp.*, samples may be collected, if feasible, during the annual MEDITS bottom trawl scientific survey (quarters 2, 3) and during the biological sampling of commercial fisheries (quarters 1, 2, 3, 4). A minimum of 24 full stomachs may be sampled for *Lophius spp.* in MEDITS in GSAs 20 and 22 per year, while no minimum number of *Lophius spp.* stomachs has been set to be sampled in GSA 23. Furthermore, a minimum of 24 full stomachs may be sampled for *Lophius spp.* during the biological sampling of commercial fisheries in GSAs 20 and 22 per year. No minimum number of *Lophius spp.* stomachs has been set to be sampled in commercial fishing trips samplings in GSA 23. The stomach numbers will be distributed across the two life stages/size classes defined in the recommendations of the STREAM project for the species, i.e., i) small individuals (<30 cm TL); ii) large individuals (>30 cm TL).

Is the sampling design compliant with the 4S principle?

NA

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

Sampling design and protocols used in the implementation of stomachs sampling in GRC during 2025-2027 will follow the provisions of RWP 2025-2027 that was prepared by RCG Med&BS to be implemented in the Mediterranean and Black Seas.

Link to sampling design documentation:

GRC will carry out stomachs sampling analysis according to the provisions of RWP 2025-2027 and the recommendations of the STREAM project, as detailed above.

Link to the documentation:

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

Design follows international recommendations:

Y

GRC will carry out stomachs sampling analysis according to the provisions of RWP 2025-2027 and the recommendations of the STREAM project, as detailed above

Link to sampling protocol documentation:

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

https://dcf.ec.europa.eu/regional-coordination/regional-grants_en

Protocol follows international recommendations:

Y

GRC will carry out stomachs sampling analysis according to the provisions of RWP 2025-2027 and the recommendations of the STREAM project, as detailed above.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Sampling will be carried out mainly during the annual MEDITS scientific survey (quarters 2,3). If feasible, additional sampling will be carried out during the samplings of commercial fishing trips (quarters 1,2,3,4).

Data capture

Means of data capture:

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:

The scoreboard for stomach content sampling proposed by the STREAM project 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:

N

Documentation on data validation will be available in 2025 at the earliest.

Data storage
National database: 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 Research, respectively. International database: NA Quality checks and data validation documentation: Documentation on data validation will be available in 2025 at the earliest.
Sample storage
Storage description: Stomach samples will be kept frozen in the labs of FRI and HCMR until their analysis. Link to the documentation: https://inale.gr/wp-content/uploads/2021/10/Stomach_contents_STREAM_Del.4.1.pdf Sample analysis: The processing of samples will be carried out according to the sampling protocol recommended by the STREAM project 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. <i>Journal of Fish Biology</i>, 95: 1364–1373. Hyslop E.J. (1980). Stomach contents analysis- a review of methods and their application. <i>Journal of Fish Biology</i>, 17: 411-429.
Data processing
Evaluation of data accuracy (bias and precision): Y 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:

N

Documentation on data validation will be available in 2025 at the earliest.

Quality document associated to a dataset:

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 2025 at the earliest.

Validation of the final dataset:

Documentation on data validation will be available in 2025 at the earliest.

ANNEX 1.2 - QUALITY REPORT FOR SOCIOECONOMIC DATA SAMPLING SCHEME

The quality report fulfils Article 6 (3) (d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II, points 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture and any complementary data collection of fishing activity and fish processing.

Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study), available on the DCF website.

Provide information under each point in all sections.

Please indicate sampling scheme identifier (e.g combination of 'sector' and 'sampling scheme' or 'variables' from the annex table). Each identifier is unique and can be used only once; records with identical scheme identifiers are overwritten in the platform. Do not add any tables others than from the template.

Create a first survey specification record as a reference to the regional WP, add 'RWP ECON' in the 'sector name' field and leave the other fields empty.

Sampling scheme identifier: RWP_ECON

Survey Specifications
<i>'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.'</i>
Sector name(s): RWP ECON 2025-2027
Sampling scheme:
Variables:
Supra region(s):
Survey planning
Survey design and strategy

1. Data sources: 2. Sample sizes: 3. Survey methods: 4. Additional information used in the survey strategy:
Estimation design
1. Calculation method for population estimate: 2. Calculation method for derived data: 3. Nonresponse handling:
Error checks
Data storage and documentation
1. Data storage: 2. Documentation:
Revision
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.

Sampling scheme identifier: Fishing_activity_PSS

Survey Specifications
<i>'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.</i> <i>'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.</i> <i>'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.</i> <i>'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'.</i>
Sector name(s): RWP ECON implementing years: 2025-27 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

The sampling scheme applies to the total vessel population, apart from demersal seiners and per seiners (DTSVL1824; DTSVL2440; PS1218; PS1824; PS2440). The sample unit is the vessel, and it is selected from the Greek National Fleet Register, which corresponds to December 31st 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).

The Control Regulation is implemented in the Greek fleet as follows. Greek vessels from 12 metres LOA and above, are obliged to report their landings daily through the Electronic Reporting System (ERS) and their effort through Vessel Monitoring System (VMS). Vessels between 10 m and 12 m LOA are obliged to report their landings daily through the ERS, however regarding their effort only the vessels that have a special authorisation are obliged to install a VMS device and consequently to report their effort. Vessels with a LOA of less than 10 m are not obliged for electronic reporting of their landing or effort unless they have a special authorisation. With the revision of the Control Regulation, all vessels, regardless of their LOA, will gradually install both ERS and VMS type devices by 2030. All fishing vessels, with no obligation for electronic reporting submit their landings, in a monthly basis, through the Integrated Monitoring System of Fisheries Activities (OSPA) of the Ministry of Rural Development and Food, since 2018.

For the validation of those data, fishing effort and landings data for vessels with no electronic reporting obligation, are estimated through complementary data collection methods, including random sampling and face-to-face interviews using structured questionnaires. Biological sampling data are also collected, as recommended in MARE/2014/19.

In addition, for vessels >10m, some variables and fleet segments are validated through probability sample surveys to ensure accuracy. This validation is necessary because there are still errors in reported species names, landings, catch weight, and values. These issues could affect the reliability of the data. The validation process focuses on

the variables: Value of landings total and per commercial species; Live Weight of landings total and per species; days at sea; number of trips; and average price per species, and it is applied to the following fleet segments: “Vessels using hooks 12-18m” and “Vessels using drift and/or fixed netters 12-18m”. Previous validation for demersal trawlers and purse seiners showed no significant differences in the data; therefore, no complementary data collection is needed for this part of the fleet.

Survey design and strategy

1. Data sources:

The data source for the complementary data collection is face-to-face **interviews** with fishers using structured questionnaires. The interviewers are fisheries scientists who receive the appropriate yearly training for the correct completion of the questionnaires.

2. Sample sizes:

For the complementary data collection, a stratified random sampling scheme is chosen. The sample unit is the vessel, and it is selected randomly from each stratum, as 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 first step for the determination of the sample size is to define the target population (number of vessels) and its segmentation (Table1). Then, the clustering scheme is presented in Table 3. Finally, the total number of vessels in the Greek fleet after the clustering of segments (based on the Greek National Fleet Register retrieved from the EU on September 30th 2024) is presented in Table 4.

The Control Regulation is implemented in the Greek fleet as follows. Vessel from 10 meters LOA and above, are obliged to daily report their catches through Electronic Reporting System (ERS). In addition, all vessels under 12 meters (LOA) are also obliged to daily report their catches through ERS system, as well as to install a Vessel Monitoring System (VMS) device, if they have a fishing authorisation. With the revision of the control regulation all vessels regardless of their LOA will gradually install both ERS and VMS type devices up until 2030.

All fishing vessels, with no obligation for electronic reporting have been submitting their catches, in a monthly basis, though the Integrated Monitoring System of Fisheries Activities (OSPA) of the Ministry of Rural Development and Food, since. For the validation of those data, fishing effort and landings data for vessels with no electronic reporting obligation, are estimated through complementary data collection methods, including random sampling and face-to-face interviews using structured questionnaires. Biological sampling data are also collected, as recommended in MARE/2014/19.

In addition, for vessels >10m, some variables and fleet segments are validated through probability sample surveys to ensure accuracy. This validation is necessary because there are still errors in reported species names, landings, catch weight, and values. These issues could affect the reliability of the data. The validation process focuses on the variables: Value of landings total and per commercial species; Live Weight of landings total and per species; days at sea; number of trips; and average price per species, and it is applied to the following fleet segments: “Vessels using hooks 12-18m” and “Vessels using drift and/or fixed netters 12-18m”. Previous validation for demersal trawlers and purse seiners showed no significant differences in the data; therefore, no complementary data collection is needed for this part of the fleet.

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 30th 2024

			Length Class				
	Gears	métiers (Activ. level 6)	VL0006	VL0612	VL1218	VL1824	VL2440
Active Gears	Demersal trawlers and/or demersal seiners (DTS)	OTB_DEF_>=40_0_0	-	-	3	89	139
	Purse seiners (PS)	PS_SPF_>=14_0_0	-	2	76	119	24
	Dredgers (DRH) *	DRB_MOL_0_0_0	7	31	1	-	-
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	826	1351	95	7	-
	Drift and/or fixed netters (DFN)	GNS_DEF_>=16_0_0 GTR_DEF_>=16_0_0 GTN_DEF_>16_0_0	2700	5482	157	2	-
	Vessels using Pots and/or traps (FPO)	FPO_DEF_0_0_0	55	284	10	-	-

* General Directorate of Fisheries changed lately all 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.

Table 2: The clustering scheme of Greek fleet segments (based on the Greek National Fleet Register retrieved from EU on September 30th 2024).

	Merged segment(s)		Clustered segment		Nr of vessels after clustering (cluster name in parenthesis)
	Length Class	Nr of Vessels	Length Class	Nr of Vessels	
DFN	VL1824	2	VL1218	165	167 (DFNVL1218*)
DTS	VL1218	3	VL1824	88	91 (DTSVL1824*)
FPO	VL1218	9	VL0612	290	299 (PFOVL0612*)
HOK	VL1824	7	VL1218	96	103 (HOKVL1218*)
PS	VL0612	1	VL1218	76	77 (PSVL1218*)
DRB	VL0006 VL1218	7 1	VL0612	31	39 (DRBVL0612*)

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 30th 2024).

	VL0006	VL0612	VL1218	VL1824	VL2440	TOTAL
DFN	2592	5582	165	2		8,341
DRB	7	31	1			39
DTS			3	88	140	231
FPO	50	289	10			349
PS		1	76	116	28	221
HOK	790	1,386	96	7		2,279
TOTAL	3,439	7,289	351	213	168	11,460

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.

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 Ionian (C-ION), Crete (CRETE), Cyclades (CYCL), Dodecanese (DODEC), Evia (EVIA), North Ionian (N-ION), South Ionian (S-ION), Thermaikos Gulf (THERM), Thracian Sea- Limnos (THR-LIM) and Volos-Sporades (VOL-SPOR).

The FRI is responsible for coordinating and collecting questionnaires in the regions: Chios - Mytilene, Thermaikos Gulf, Thracian Sea- Limnos and Volos-Sporades. The HCMR is responsible for the remaining areas.

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

Strata	Metier	Fleet Segments
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_0612	DRH_MOL_0_0_0	Dredgers (DRB/DRH) VL0612*
LLS_0006	LLS_DEF_0_0_0	Vessels using hooks (HOK_A) VL0006
LTL_0006	LTL_LPF_60_0_0	
LHP-LHM_0006	LHP-LHM_FIF_0_0_0	Vessels using hooks (HOK_B) VL0006
LLD_0006	LLD_LPF_0_0_0	
LLS_0612	LLS_DEF_0_0_0	Vessels using hooks (HOK_A) VL0612
LTL_0612	LTL_LPF_60_0_0	
LHP-LHM_0612	LHP-LHM_FIF_0_0_0	Vessels using hooks (HOK_B) VL0612
LLD_0612	LLD_LPF_0_0_0	
LLS_1218	LLS_DEF_0_0_0	Vessels using hooks (HOK_A) VL1218
LTL_1218	LTL_LPF_60_0_0	
LHP-LHM_1218	LHP-LHM_FIF_0_0_0	Vessels using hooks (HOK_B) VL1218
LLD_1218	LLD_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

*HOK_A includes: LLS and LTL

** HOK_B includes: LLD; LHM; LH

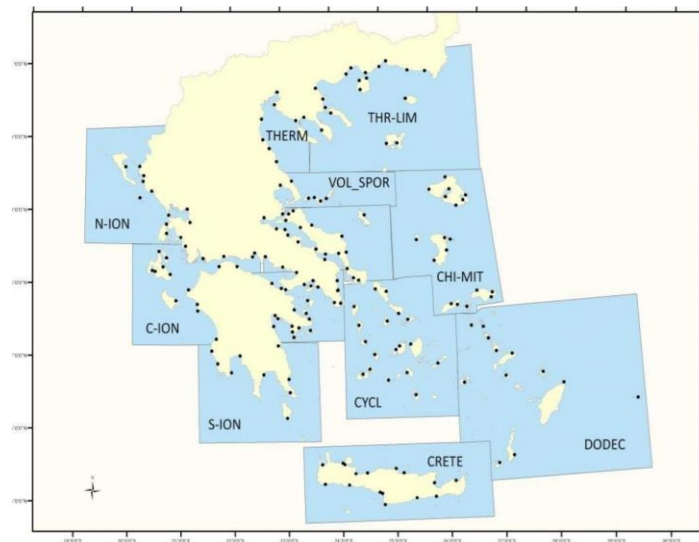


Figure 1. A map with the 12 Greek Major Areas

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

$$n = \frac{n_0 \times N}{n_0 + (N - 1)} \quad (1)$$

where N is the population size of each métier and

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

where s is the standard deviation, and $\bar{x}$ is the average of the auxiliary variable 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, considering 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 levels 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.5, available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf

Given the above figures the planned sample size per segment, is provided in the following table (Table 5)

Table 5. The planned sample rate per segment

	LENGTH CATEGORY				
	VL0006	VL0612	VL1218	VL1824	VL2440
DFN (GNS+GTN+GTR)	4.67%	4.14%	13.77%	-	-
DRB	-	12.82%	-	-	-
DTS	-	-	-	24.18%	10.00%
FPO	36.00%	28.09%	-	-	-
HOK (LHP/LHM+LLD+LLS+LTL)	4.68%	10.32%	11.65%	-	-
PS	-	-	16.88%	11.21%	28.57%

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 are 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.5, respectively.

3. Survey methods:

The supplementary data collection takes place through face-to-face **interviews** using closed-ended **Questionnaires** with experienced and well-trained interviewers.

4. Additional information used in the survey strategy:

Auxiliary information is important for determining the sample size (see equation 2). According to Deliverable 2.1 from the 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 supplementary data collection will also be utilised to validate and cross reference existing data for segments "vessels using hooks 12-18m" and "Vessels using drift and/or fixed netters 12-18m" (see also TextBox 3.1).

This is necessary because there are still errors in reported species names, landings and catch weight and values, as many fishers are unfamiliar with electronic devices and systems. In addition, inadvertent non-responses are also commonly appear. These issues can affect the reliability of the data. The validation process focuses on the variables: Value of landings total and per commercial species; Live Weight of landings total and per species; days at sea; number of trips; and average price per species.

Estimation design

1. Calculation method for population estimate:

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} is the number of active vessels in the sample per stratum, and N_{act} is the number of active vessels in the 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 strata less than 12 meters in length, except for the strata using the gears LLD and LHM, where inactivity can be based on ERS information.

For the part of the fleet where 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) using effort (fishing days) as an auxiliary variable are used.

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 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

2. Calculation method for derived data:

In cases of nonresponses in specific questions and/or error detection in the database, and if there is no way to resolve these issues otherwise (e.g., communication with interviewer and/or interviewee), derived data is estimated using conditional median imputation. This is a methodology more advanced than 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 no-respond questions 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 are 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 diversifying the fishing effort and landings in a specific segment. By doing so, the estimation becomes more reliable than in the simpler case of unconditional estimation.

This process is considered a "conditional mean (or median, to be more precise) 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).

3. Nonresponse handling:

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

The local databases are appropriately designed to prevent and detect possible errors during the data registration process. Specific treatments are integrated to prevent data misreporting, detect duplicate entries, and 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 alerts when a duplicate entry is registered.
- Databases have integrated validators with automatic warning alerts 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

1. Data storage:

The relevant data are stored in the FRI and HCMR local databases and feed the National Database.

2. Documentation:

https://inale.gr/wp-content/uploads/2023/06/Est.-Methods_WG_quality_assurance_2023.pdf

Revision

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

1. Are procedures for confidential data handling in place and documented? **YES**
2. Are protocols to enforce confidentiality between DCF partners in place and documented? **YES**
3. Are protocols to enforce confidentiality with external users in place and documented? **YES**
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No issues as far as confidentiality and anonymity are concerned.

Sampling scheme identifier: Fisheries_SocioEcon_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): RWP ECON implementing years: 2025-27 **socio economic data on 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

The sampling scheme applies to the total vessel population. The sample unit is the vessel, which is selected from the Greek National Fleet Register on December 31st of the reference year.

Survey design and strategy

1. Data sources:

The survey utilise census data derived from logbooks, sale notes and fleet registry for vessels in segments with vessel length >12m. Also, for the “subsidies on investments” variable, census data from the Managing Authority of Fisheries and Maritime Operational Programme (Ministry of Rural Development and Food) is provided. Other possible sources of subsidies on investments are not covered by the Census. For that reason, apart from census, there is also a Probability Sampling data collection Scheme for this particular variable (see Annex 1.2 PSS for

socioeconomic data on fisheries 2. Sample sizes: NA 3. Survey methods: NA 4. Additional information used in the survey strategy:. NA
Estimation design
1. Calculation method for population estimate: Describe the method of calculating population estimate from the sample. NA 2. Calculation method for derived data: Describe the method of calculating derived data, e.g. imputed values. NA (There are no nonresponse cases or other cases where imputation methods are useful) 3. Nonresponse handling: Describe treatment of nonresponse. NA (There are no nonresponse cases or other cases where imputation methods are useful)
Error checks
There is no need for specific error checks here. However, in the case of landing values, a PSS survey is also implemented for validation purposes.
Data storage and documentation
1. Data storage: 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 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 (e.g., 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 is accessible only through encrypted connections (HTTPS/SSL) and access control mechanisms. Each user has only a limited set of user rights.

2. Documentation:

Methodology report v.5 (available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

Revision

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

1. Are procedures for confidential data handling in place and documented? **YES**
2. Are protocols to enforce confidentiality between DCF partners in place and documented? **YES**
3. Are protocols to enforce confidentiality with external users in place and documented? **YES**
4. Are there any issues with the publication of data due to confidentiality reasons? Provide an explanation.
No issues, as far as confidentiality and anonymity are concerned.

No issues, as far as confidentiality and anonymity are concerned.

For more details see, Ch. 9 and 10 of the Methodology reports, v., available at:

https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

Sampling scheme identifier: Fisheries_SocioEcon_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): RWP ECON implementing years: 2025-27 **socio economic data on fisheries**

Sampling scheme: IND

Variables:

• Consumption of fixed capital and • Value of physical capital
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
The PIM methodology is applied to estimate the above variables. This methodology demands a combination of sources. More specifically, a census survey will be used to identify the number and the age of the vessels in the segment, and a probability sample survey will be used to get a value per capacity unit (in our case, LOA). Regarding the probability sampling survey, 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, which corresponds to December 31st of the reference year. Moreover, the sample unit and, therefore, the sampling frame is common 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
1. Data sources: There are two data sources for utilizing the PIM methodology. The first data source is the fleet registry, which provides information on the population and segmentation of the fleet. The second data source is face-to-face interviews with fishers using structured questionnaires to estimate the current value of their fishing vessel, including license. The interviewers are fisheries scientists who receive the appropriate yearly training for correctly completing the questionnaires. 2. Sample sizes: See Annex 1.2. for the Probability Sample Survey on economic and social variables for fisheries 3. Survey methods: The supplementary data collection takes place through face-to-face interviews using closed-ended Questionnaires with experienced and well-trained interviewers. 4. Additional information used in the survey strategy:. See Annex 1.2. for the Probability Sample Survey on economic and social variables for fisheries
Estimation design
1. Calculation method for population estimate: Describe the method of calculating population estimate from the 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 the number of vessels per fleet segment), as suggested by the Perpetual Inventory Methodology (PIM) (European Commission, 2006). More specifically, the “degressive” depreciation function is used for the variable Consumption of fixed capital. The capital values are determined assuming that the engine is renovated every 10 years, and the electronics and other equipment are renovated every 5 and 7 years, respectively, while the hull is never renovated. The share of each

asset item in the total vessel price is:

- Hull – 60%
- Engine – 20%
- Electronics – 10%
- Other equipment – 10%

For the variable Value of 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 survey results. For more information about the PIM method, see the Report of WS on Capital Value estimation WS on calculating capital value using PIM (Napoli, 13 -17 June 2011).

2. Calculation method for derived data: Describe the method of calculating derived data, e.g. imputed values.

Regarding the data gathered from the census survey, there are no reasons for using derived data, e.g. imputed values. For the methodology of calculating derived data, see Annex 1.2. for Probability Sample Survey on economic and social variables on fisheries

3. Nonresponse handling: Describe treatment of nonresponse.

Regarding the data gathered from the 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 Annex 1.2. for the Probability Sample Survey on economic and social variables in fisheries

Error checks

Regarding the data gathered from the census survey, there are no errors identified. Therefore, this part is only relevant for the probability sample survey, and it is described in Annex 1.2. for the Probability Sample Survey on economic and social variables for fisheries.

Data storage and documentation

1. Data storage:

The survey files, including case information, are created using a specific layout. If asked, the survey data can be unequivocally mapped to the internationally required fields, codes, and formats. 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 database verification includes 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 (e.g., 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 is accessible only through

encrypted connections (HTTPS/SSL) and access control mechanisms. Each user has only a limited set of user rights.

2. Documentation:

Methodology report v.5 (available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

Revision

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

1. Are procedures for confidential data handling in place and documented? **YES**
2. Are protocols to enforce confidentiality between DCF partners in place and documented? **YES**
3. Are protocols to enforce confidentiality with external users in place and documented? **YES**
4. Are there any issues with the publication of data due to confidentiality reasons? Provide an explanation.

No issues, as far as confidentiality and anonymity are concerned.

For more details, see, Ch. 9 and 10 of the Methodology report, v.5, available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf

Sampling scheme identifier: Fisheries_SocioEcon_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): RWP ECON implementing years: 2025-27 **socio economic data on fisheries**

Sampling scheme: PSS

Variables:

- Days at sea (segments with vessels <12m plus DFNVL1218 and HOKVL1218)
- 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 (<12m plus DFNVL1218 and HOKVL1218)
- 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
- Unpaid labour
- Unpaid labour by gender
- Value of unpaid labour

Supra region(s): Mediterranean Sea and Black Sea

Survey planning

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, which corresponds to December 31st of the reference year. Moreover, the sample unit and, therefore, the sampling frame for the economic and effort variables follows the Commission Decision 2010/93/E.U. (European Commission, 2010 - section A.1.1).

It should also be noted that for Demersal trawlers and/or demersal seiners and per seiners, the variable's days at sea and gross value of landings are not collected, as the MS collects the relevant data by Census (which has already been validated and considered reliable from the previous programming period).

Survey design and strategy

1. Data sources:

The data collection source is face-to-face **interviews** with fishers using structured questionnaires. The interviewers are fisheries scientists who receive the appropriate yearly training for the correct completion of the questionnaires

2. Sample sizes:

For the socioeconomic data collection, a stratified random sampling scheme is chosen. The sample unit is the vessel, and it is selected randomly from each stratum, as 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 first step for the determination of the sample size is to define the target population (number of vessels) and its segmentation (see Table below)

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 30th 2024

			Length Class				
			VL0006	VL0612	VL1218	VL1824	VL2440
Active Gears	Gears	métiers (Activ. level 6)					
	Demersal trawlers and/or demersal seiners (DTS)	OTB_DEF_>=40_0_0	-	-	3	89	139
	Purse seiners (PS)	PS_SPF_>=14_0_0	-	2	76	119	24
	Dredgers (DRH) *	DRB_MOL_0_0_0	7	31	1	-	-
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	826	1351	95	7	-
	Drift and/or fixed netters (DFN)	GNS_DEF_>=16_0_0 GTR_DEF_>=16_0_0 GTN_DEF_>16_0_0	2700	5482	157	2	-
	Vessels using Pots and/or traps (FPO)	FPO_DEF_0_0_0	55	284	10	-	-

* The General Directorate of Fisheries recently changed all 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.

Then, the clustering scheme is presented in the following table.

Table 2: The clustering scheme of Greek fleet segments (based on the Greek National Fleet Register retrieved from EU on September 30th 2024).

	Merged segment(s)		Clustered segment		Nr of vessels after clustering (cluster name in parenthesis)
	Length Class	Nr of Vessels	Length Class	Nr of Vessels	
DFN	VL1824	2	VL1218	165	167 (DFNVL1218*)
DTS	VL1218	3	VL1824	88	91 (DTSVL1824*)
FPO	VL1218	9	VL0612	290	299 (PFOVL0612*)
HOK	VL1824	7	VL1218	96	103 (HOKVL1218*)
PS	VL0612	1	VL1218	76	77 (PSVL1218*)
DRB	VL0006 VL1218	7 1	VL0612	31	39 (DRBVL0612*)

Finally, 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 30th 2024) is presented in the Table below

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 30th 2024).

	VL0006	VL0612	VL1218	VL1824	VL2440	TOTAL
DFN	2592	5582	165	2		8,341
DRB	7	31	1			39
DTS			3	88	140	231
FPO	50	289	10			349
PS		1	76	116	28	221
HOK	790	1,386	96	7		2,279
TOTAL	3,439	7,289	351	213	168	11,460

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
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_0612	DRH_MOL_0_0_0	Dredgers (DRB/DRH) VL0612*
LLS_0006	LLS_DEF_0_0_0	Vessels using hooks (HOK_A) VL0006
LTL_0006	LTL_LPF_60_0_0	
LHP-LHM_0006	LHP-LHM_FIF_0_0_0	Vessels using hooks (HOK_B) VL0006
LLD_0006	LLD_LPF_0_0_0	Vessels using hooks (HOK_A) VL0612
LLS_0612	LLS_DEF_0_0_0	
LTL_0612	LTL_LPF_60_0_0	
LHP-LHM_0612	LHP-LHM_FIF_0_0_0	Vessels using hooks (HOK_B) VL0612
LLD_0612	LLD_LPF_0_0_0	Vessels using hooks (HOK_A) VL1218
LLS_1218	LLS_DEF_0_0_0	
LTL_1218	LTL_LPF_60_0_0	
LHP-LHM_1218	LHP-LHM_FIF_0_0_0	Vessels using hooks (HOK_B) VL1218
LLD_1218	LLD_LPF_0_0_0	Drift and/or fixed netters (DFN) VL0006
GNS_0006	GNS_DEF_>=16_0_0	
GTR_0006	GTR_DEF_>=16_0_0	
GTN_0006	GTN_DEF_>16_0_0	Drift and/or fixed netters (DFN) VL0612
GNS_0612	GNS_DEF_>=16_0_0	
GTR_0612	GTR_DEF_>=16_0_0	
GTN_0612	GTN_DEF_>16_0_0	Drift and/or fixed netters (DFN) VL1218
GNS_1218	GNS_DEF_>=16_0_0	
GTR_1218	GTR_DEF_>=16_0_0	
GTN_1218	GTN_DEF_>16_0_0	Vessels using Pots and/or traps (FPO) VL0006
FPO_0006	FPO_DEF_0_0_0	
FPO_0612		Vessels using Pots and/or traps (FPO) VL0612

*HOK_A includes: LLS and LTL

** HOK_B includes: LLD; LHM; LH

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 Ionian (C-ION),

Crete (CRETE), Cyclades (CYCL), Dodecanese (DODEC), Evia (EVIA), North Ionian (N-ION), South Ionian (S-ION), Thermaikos Gulf (THERM), Thracian Sea- Limnos (THR-LIM) and Volos-Sporades (VOL-SPOR). The FRI is responsible for coordinating and collecting questionnaires in the regions: Chios - Mytilene, Thermaikos Gulf, Thracian Sea- Limnos and Volos-Sporades. The HCMR is responsible for the remaining areas.

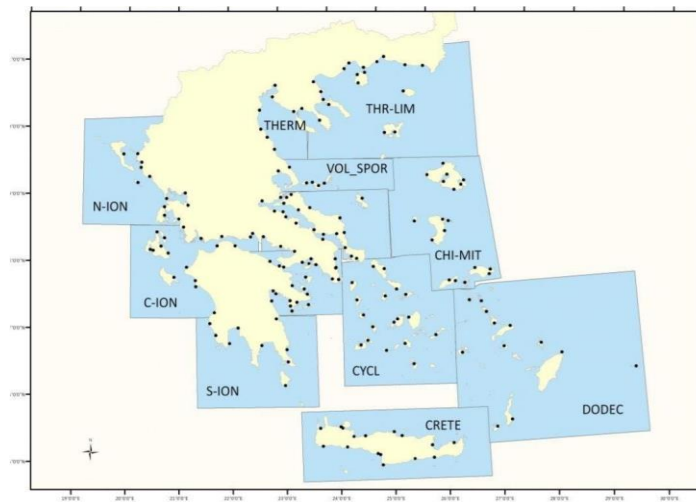


Figure 1. the 12 Greek Major Areas

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

$$n = \frac{n_0 \times N}{n_0 + (N - 1)} \quad (1)$$

where N is the population size of each métier and

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

where s is the standard deviation, and $\bar{x}$ is the average of the auxiliary variable selected as the one that can better represent the stratum variation. According to Deliverable 2.1 from the 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, considering 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 levels 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.5, available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

Given the above figures the planned sample size per segment, is provided in the following table (Table 5)

Table 5. The planned sample rate per segment

	LENGTH CATEGORY				
	VL0006	VL0612	VL1218	VL1824	VL2440
DFN (GNS+GTN+GTR)	4.67%	4.14%	13.77%	-	-
DRB	-	12.82%	-	-	-
DTS	-	-	-	24.18%	10.00%
FPO	36.00%	28.09%	-	-	-
HOK (LHP/LHM+LLD+LLS+LTL)	4.68%	10.32%	11.65%	-	-
PS	-	-	16.88%	11.21%	28.57%

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 are 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.5, respectively, available at:

https://www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf .

3. Survey methods:

The data collection takes place through face-to-face **interviews** using closed-ended **Questionnaires** with experienced and well-trained interviewers.

4. Additional information used in the survey strategy:

Auxiliary information is important for the determination of the sample size (see equation 2). According to Deliverable 2.1 from the 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.

Estimation design

1. Calculation method for population estimate:

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:

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

where $\pi_i = n_{\text{act}} / N_{\text{act}}$ is the inclusion probability for each stratum, n_{act} is the number of active vessels in the sample per stratum, and N_{act} is the number of active vessels in the 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 population vessels 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 LLD and LHM, where inactivity can be based on ERS information.

2. Calculation method for derived data:

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 methodology is more advanced than the most popular mean imputation and has the same rationale as 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 are 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 diversifying the fishing effort and landings in a specific segment. By doing so, the estimation becomes more reliable than in the simpler case of unconditional estimation. The auxiliary parameters used in this analysis are presented in Table 6.

This process is considered a "conditional mean (or median, to be more precise) 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 6. 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 (%)

3. Nonresponse handling:

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 with 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 correlates with other variables. For example, the education level is often missing in vessels with a high number of employers. Finally, the missing values 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 value 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, which leads to an 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

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 to estimate 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 outside the benchmark tables' ranges 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:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

The data utilised to determine the ranges derived from observations per vessel during the period 2012-2018.

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 from 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 interviewee's incorrect answers contain 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

1. Data storage:

The survey files, including case information, are created using a specific layout. If asked, the survey data can be unequivocally mapped to the internationally required fields, codes, and formats. 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 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 before the production use of the data integration software.

Data is 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 database verification includes 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 (e.g., 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 is accessible only through encrypted connections (HTTPS/SSL) and access control mechanisms. Each user has only a limited set of user rights.

2. Documentation: Methodology report v.5 (available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

Revision

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

1. Are procedures for confidential data handling in place and documented? **YES**
2. Are protocols to enforce confidentiality between DCF partners in place and documented? **YES**
3. Are protocols to enforce confidentiality with external users in place and documented? **YES**
4. Are there any issues with the publication of data due to confidentiality reasons? Provide an explanation.
No issues as far as confidentiality and anonymity are concerned.

For more details, see Ch. 9 and 10 of the Methodology report, v.5, available at:

www.agreri.gr/sites/default/files/projects/Methodology%20%26%20Quality%20Report_Fisheries%20v5.pdf).

Sampling scheme identifier: Aquaculture _NPS_E-S

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.

<i>'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.</i> <i>'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'.</i>
Sector name(s): RWP ECON implementing years:2025-2027 Aquaculture
Sampling scheme: NPS (Non-Probability Sample Survey)
Variables: All Economic and Social variables
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
In Greece, the seabass and seabream segment constitute the largest part of aquaculture production, followed by the mussel, trout, and other freshwater fish segments. In Greece, 16% of the aquaculture companies are SA and Ltd enterprises that demonstrate over 75% 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 2022 survey, the aquaculture sector is composed of 657 units. Of those aquaculture units, 340 employ less than 6 persons, 115 have 6-10 employees and 202 have more than 10 employees. For the 2025-2027 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 10 years the data collection was implemented by census achieving high response rate percentages. Regarding the social variables, the planned sample rates for 2025-2027 range from 60% to 70%.
Survey design and strategy
1. Data sources: The data sources will include data from interviews, published balance sheets, and the data from the Integrated Monitoring System of Fisheries Activities (OSPA) 2. Sample sizes: 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 (90% 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 3. Survey methods: The data sources will include questionnaires filled during onsite and online interviews and sent by mail, by post and filled in by phone. Additionally, it will include data from published balance sheets and the data from the Integrated Monitoring System of Fisheries Activities (OSPA) 4. Additional information used in the survey strategy: For cross-checking purposes, the time series data from the 10-year aquaculture data collection, in combination

with the data from the Hellenic Statistical Authority and OSPA database, will be used for verification and cross-referencing of the information.

Estimation design

1. Calculation method for population estimate:

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:

- 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.
- Definition of the weightage of subpopulation characteristic (production volume and number of employees)
- Selection of the appropriate sample size, maintaining the proportion
- 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 Ministry's database for the reference year and participation in previous annual surveys for the collection of fisheries data.

2. Calculation method for derived 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 demonstrate 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 Ministry's database, produce no balance sheet or economic reports and did not respond to questionnaire inquiries, will be excluded from the population

3. Nonresponse handling.

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
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. Data storage: Data is stored first in spreadsheets for processing and then uploaded on the FRI database. All collected data are entered into a database according to the specifications outlined in the corresponding operational manuals and national record layouts. The data are verified for structural consistency both within and across sources, ensuring compliance with the defined formats and record layouts. Data entry occurs on a regular, incremental basis as the survey progresses. Only authorized users, working from designated workstations, are permitted to enter data into the database. 2. Documentation: The methodological documentation has been uploaded and are available on the following link: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Data_Quality_Aquaculture %26 Processing Industries.pdf
Revision
The NWP methodology will be reviewed annually.
Confidentiality
1. Are procedures for confidential data handling in place and documented? YES 2. Are protocols to enforce confidentiality between DCF partners in place and documented? YES 3. Are protocols to enforce confidentiality with external users in place and documented? YES 4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. There are no issues.

Sampling scheme identifier: Processing _NPS_E-S

Survey Specifications
<i>'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.</i> <i>'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.</i> <i>'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.</i> <i>'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'.</i>
Sector name(s): RWP ECON implementing years Processing 2025-2027
Sampling scheme: NPS (Non-Probability Sample Survey)

Variables: All Economic and Social variables
Supra region(s): Mediterranean and Black Sea
Survey planning
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 decade the number of average active processing companies ranged from 170-190. For 2022, 136 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 deshellings of mussels. The activity segmentation is very important for the sampling strategy. For the 2025-2027 period, the Non-Probability Sample Survey (NPS) sampling scheme will be applied with sample rates ranging from 40% to 70%. For social variables, the planned sample rates are lower since the employment information in the sector is not stored but requires a complex process of data retrieval, and it cannot be sourced from other databases. 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. Data sources: The data sources will include data from interviews, published balance sheets, and the data from the Integrated Monitoring System of Fisheries Activities (OSPA) 2. Sample sizes: Previous data surveys, 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 deshellings 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 deshellings activities, following 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. 3. Survey methods: The data sources will include questionnaires filled during onsite and online interviews and sent by mail, by post and filled in by phone. Additionally, it will include data from published balance sheets and the data from the Integrated Monitoring System of Fisheries Activities (OSPA). 4. Additional information used in the survey strategy: For cross-checking purposes, the time series data from the 10-year aquaculture data collection, in combination with the data from the Hellenic Statistical Authority and OSPA database, will be used for verification and cross-referencing of the information.
Estimation design

1. Calculation method for population estimate:

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:

- i. 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.
- ii. Definition of the weightage of subpopulation characteristic (production volume, number of employees and facilities/assets)
- iii. Selection of the appropriate sample size, maintaining the proportion
- iv. Implementation of the surveys according to the defined quotas

2. Calculation method for derived 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 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.

3. Nonresponse handling:

In non-response cases, the missing variable values will be calculated with the 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
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 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. Data storage: Data is stored first in spreadsheets for processing and then uploaded on the FRI data base. Data is stored first in spreadsheets for processing and then uploaded on the FRI database. All collected data are entered into a database according to the specifications outlined in the corresponding operational manuals and national record layouts. The data are verified for structural consistency both within and across sources, ensuring compliance with the defined formats and record layouts. Data entry occurs on a regular, incremental basis as the survey progresses. Only authorized users, working from designated workstations, are permitted to enter data into the database. 2. Documentation: The methodological documentation has been uploaded and are available on the following link: http://www.alieia.minagric.gr/sites/default/files/basicPageFiles/Data_Quality_Aquaculture%26Processing Industries.pdf
Revision
The NWP methodology will be reviewed annually
Confidentiality
1. Are procedures for confidential data handling in place and documented? YES 2. Are protocols to enforce confidentiality between DCF partners in place and documented? YES 3. Are protocols to enforce confidentiality with external users in place and documented? YES 4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. There are no issues.