MINISTRY OF AGRICULTURE AND FOOD
EXECUTIVE AGENCY FOR FISHERIES AND AQUACULTURE

EAFA
EXECUTIVE AGENCY FOR FISHERIES AND AQUACULTURE

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

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

Commission Delegated Decision (EU) 2021/1167 of 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

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

2023

Version 2

Burgas, 30.05.2024

CONTENTS

Data collection framework at national level

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

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

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

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

The managing authority for the implementation of the Bulgaria Work Plan for collection, management and use of data in the fisheries and aquaculture sectors is the Executive Agency for Fisheries and Aquaculture (EAFA). The coordination of the implementation of the WP is carried out by national correspondent – Ms Simona Nicheva.

Contact details of Ms Simona Nicheva.
Phone: +359 889 174517
Fax: +359 56 876 082
e-mail: simona.nicheva@iara.government.bg
Address: 1 Knyaz Aleksandar Batenberg Str., 8000 Burgas, Bulgaria.
Website: http://dcf-bulgaria.bg/ and http://iara.government.bg/

The EAFA's partners for the implementation of WP are:

1. Institute of Oceanology - Bulgarian Academy of Sciences (IO-BAS)
Director: Assoc. prof. Nikolay Valchev, PhD
phone: +359 52 370 486
fax: +359 52 370 483
e-mail: office@io-bas.bg
address: First May Street 40, P.O. Box 152, 9000 Varna, Bulgaria
website: http://io-bas.bg/en/home-en/
The Institute of Oceanology, Bulgarian Academy of Sciences is conducting the pelagic trawl surveys and the biological monitoring of pelagic species from commercial fisheries.

2. Institute of Fisheries and Aquaculture (IFA)
Director: Assoc. prof. Angelina Ivanova, PhD
tel.: +359 32 956033
fax: +359 32 953924
e-mail: iraplv@abv.bg; iraplv@yahoo.com
address: 248 Vasil Levski str., 4000 Plovdiv, Bulgaria
website: https://www.ira-plovdiv.bg/
The Institute of Fisheries and Aquaculture is involved in the biological monitoring of turbot from commercial fisheries.

3. Institute of Fish Resources (IFR)
Director: Assoc. prof. Elitsa Petrova. PhD

Tel.: +359 52 632 065
Fax: +359 52 632 066
e-mail: director@ifrvarna.com
address: Blvd Primorski 4, 9000 Varna, Bulgaria
website: https://www.ifrvarna.com/index.php/bg/
The Institute of Fish Resources is conducting the bottom trawl surveys, biological monitoring of rapa whelk from commercial fisheries and observers' on board programme.

Link to the Bulgarian data collection website: http://dcf-bulgaria.bg/

(max. 1000 words)

Text Box 1b: Other data collection activities

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

1. Aim of the data collection activity

Support the operation and functioning of the RCG´s Secretariat for a fluent regional coordination of data collection activities.

2. Duration of the data collection activity

01/01/2023 – 31/12/2025

3. Methodology and expected outcomes of the data collection activity

The Secretariat´s organizational structured has been set up and pilot tested throughout SecWeb project. The key functions of the RCG´s Secretariat have been determined in close collaboration with all RCGs, in particular with RCG and Intersessional Subgroups (ISSGs) chairs. A business model has been developed. In addition, good practices in communication within and among the RCGs have been promoted and installed. The overall capacity to reach out to a wider public and increase the visibility of the work and output of the RCGs has been boosted with the development of a dedicated website and the consolidation of a visual identity.

RCG chairs and the RCG´s network in general have acknowledged the added value of having an RCG´s Secretariat to the overall aim of improving data collection activities. Based on SecWeb project outputs the proposed data collection activity will connect the whole RCG network and stakeholders to work together on common goals. The Secretariat provides fluent administrative and coordination support for more efficient regional coordination liberating national experts involved in data collection activities from heavy burden administrative tasks.

Overall expected outcomes

✓ A full-time dedicated Secretariat support service for the RCGs enables a consistent approach to administering RCG activities, facilitates communication, and enhances the intersessional work, supporting also the work of sub-groups.

✓ A dynamic and permanently updated website will be kept available including as features:

o Integration – allowing seamless synchronization with third-party information needs and requests.

o Responsive display – to serve content across multiple devices, screens, and browsers.

o User experience- maintaining a satisfactory user experience throughout the website sections.

o Accessibility – To any interested visitor in a user-friendly way across the website sections.

o Retention- keeping visitors coming back to the website.

o Links to relevant restricted access sites and virtual environments.

✓ The Visual identity for the RCGs is increasingly consolidated and visibility and understanding of the work by the RCGs is enhanced for the relevant stakeholder groups.

✓ A regularly updated Stakeholders' database improves the communication function among the RCGs' experts and the stakeholders' community.

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

(max 900 words per activity)

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

During 2023 the RCGs Secretariat services and tools were financed by a short-term/low value contract by the individual Member States (23 out of 26 MS) together with a European Commission service contract running from the end of August 2023 to end of February 2024. These contracts enabled the full-scale operation of the RCGs Secretariat along the year (from March 2023 until Feb 2024). The pan regional ISSG National Correspondents continued the discussions on how to implement the long-term stabilization of the services and tools and ran several consultations with the MS. A main conclusion from these, is the fact that the administrative procedures at national level are a continuous and complex constraint for some of the MS. Further discussions on the long-term funding scenarios are planned during 2024. The objective is to develop and implement the long-term funding solution for the RCGs Secretariat and the tools, while simultaneously, a suitable approach needs to be found to keep the services and tools working continuously to guarantee the support to the RCGs and the LM.

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

Original outcomes were achieved.

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

The longer-term perspective will build upon the outcomes from SECWEB and dealt with inter-sessionally and pan-regionally by ISSG NCs in 2024 and beyond.

(max. 900 words per study)

SECTION 2: BIOLOGICAL DATA

Text Box 2.1: List of required species/stocks

(Region/RFMO/RFO/IO: 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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.1.

Deviations from the work plan

List the deviations (if any) in the achieved data collection (lengths only) compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.1.

The deviations concerned *Scophthalmus maximus*, *Trachurus mediterraneus* and *Merlangius merlangus* - the achieved number of individuals measured for length at national level is more than 150% higher than the planned minimum because the Institute for fisheries and aquaculture /responsible for the biological monitoring of turbot/ and Institute of oceanology /responsible for the biological monitoring of horse mackerel and whiting/ decided to investigate more landings in order to obtain a higher level of significance. The oversampling did not lead to any financial burdens.

Actions to avoid deviations

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

No action needed. According to the scientists from the research institutes in Bulgaria, the collection of more samples and the measurement of biological parameters of more individuals than the minimum planned in the work plan (when this is possible and does not cost additional funds) contribute to more reliable and detailed results to be used for stock assessments.

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

Text Box 2.2: Planning of sampling for biological variables

(Region/RFMO/RFO/IO: 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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

List the deviations (if any) in the achieved collection of biological data (other than lengths), compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.2.

The deviations concerned *Scophthalmus maximus*, *Trachurus mediterraneus* and *Merlangius merlangus* - the achieved number of individuals measured for weight at national level is more than 150% higher than the planned minimum because the Institute for fisheries and aquaculture /responsible for the biological monitoring of turbot/ and Institute of oceanology /responsible for the biological monitoring of horse mackerel and whiting/ decided to investigate more landings in order to obtain a higher level of significance. The oversampling did not lead to any financial burdens.

Engrauslis encrasicolus was not present in the catch during the spring and autumn PTSBS, so even though the collection of biological data for the species from the research survey was planned in Table 2.2, it was not possible.

Actions to avoid deviations.

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

No action needed. According to the scientists from the research institutes in Bulgaria, the collection of more samples and the measurement of biological parameters of more individuals than the minimum planned in the work plan (when this is possible and does not cost additional funds) contribute to more reliable and detailed results to be used for stock assessments. The biological data for *Engrauslis encrasicolus* in the future PTSBS will be collected and reported if catches exist.

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

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.

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

The pilot project for assessment of the share of catches from recreational fisheries in relation to commercial catches by the Bulgarian fleet in the Black sea, which was planned for initially for 2020 in the previous work plan, was postponed for 2021 due to Covid-19 restrictions and administrative burdens. A screening survey to identify the target population of recreational fishers and their fishing characteristics was performed in 2022, according to the 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.

The main object of the pilot study on recreational fishing in the Black Sea, through a screening survey, was the assessment of the number of recreational fishers practicing marine fishing across the Bulgarian Black Sea coast. The method of obtaining information was a telephone survey with a nationally representative sample of 1 000 respondents on the territory of the country.

According to the respondents who answered affirmatively to the question of whether they are engaged in marine recreational fishing on the Bulgarian Black Sea coast, 2.2% of the adult population of Bulgaria over 18 years of age are engaged in recreational marine fishing. As a number, this part of the population is about 121 589 people. In addition, was provided information regarding the most visited places by recreational fishers, which methods and gears they used, what is the total number of days during which recreational fishing was practiced, what are the species of fish and/or other marine organisms that are most often caught, the quantity by species and comparison with the commercial fisheries. In regards to the obtained data the most often species caught are species from the Gobiidae family followed by Mediterranean horse mackerel, mullet, and bluefish. The total quantity caught by recreational fishers represents 6.8% of the total commercial catches in 2021, and the value for this species mentioned by the recreational fisheries is estimated to be 9.6% of the total value of commercial landings in 2021.

The result of the survey presents quite an interesting situation regarding the marine recreational fisheries in the Bulgarian Black sea waters, which is based on the opinion of 22 respondents from the pilot study. The importance of this part of the fisheries seems to be questionable, due to the low number of respondents who answered that they are fishing in the Black sea 22 from 1000 contacted, some of the estimations are considered not very reliable, especially regarding the quantities of red mullet that respondents of the survey provided. From all species that were caught by the recreational fishermen there is only one

which is listed in Table 2.4 of the Bulgarian Work Plan – *Sarda Sarda*, but the estimated amount for the whole year is just 0.8 tonnes.

In order to ensure continuity of data collection regarding marine recreational fisheries, comparability with the already available data, and ensure the taking of right decisions based on more reliable data Bulgaria will conduct a new survey in 2024. The report from the survey is available at: http://dcf-bulgaria.bg/documents/

The currently available information is that the species eel (including in fresh water), elasmobranchs and highly migratory ICCAT species, listed in Table 4 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, are not presented in the area, there are no records for catch or landings in the last decades. Statements from our research institutes are available on the Bulgarian DCF wed page - http://dcf-bulgaria.bg/data-collection-methodologies/.

(max 900 words per region)

Deviations from the work plan

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

There were no deviations.

The pilot project for assessment of the share of catches from recreational fisheries in relation to commercial catches by the Bulgarian fleet in the Black Sea, which was planned for initially for 2020 in the previous work plan, was postponed for 2021 due to Covid-19 restrictions and administrative burdens. A screening survey to identify the target population of recreational fishers and their fishing characteristics was performed in 2022, according to the 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.

The main object of the pilot study on recreational fishing in the Black Sea, through a screening survey, was the assessment of the number of recreational fishers practicing marine fishing across the Bulgarian Black Sea coast. The method of obtaining information was a telephone survey with a nationally representative sample of 1 000 respondents on the territory of the country.

According to the respondents who answered affirmatively to the question of whether they are engaged in marine recreational fishing on the Bulgarian Black Sea coast, 2.2% of the adult population of Bulgaria over 18 years of age are engaged in recreational marine fishing. As a number, this part of the population is about 121 589 people. In addition, was provided information regarding the most visited places by recreational fishers, which methods and

gears they used, what is the total number of days during which recreational fishing was practiced, what are the species of fish and/or other marine organisms that are most often caught, the quantity by species and comparison with the commercial fisheries. In regards to the obtained data the most often species caught are species from the *Gobiidae* family followed by Mediterranean horse mackerel, mullet, and bluefish. The total quantity caught by recreational fishers represents 6.8% of the total commercial catches in 2021, and the value for this species mentioned by the recreational fisheries is estimated to be 9.6% of the total value of commercial landings in 2021.

The result of the survey presents quite an interesting situation regarding the marine recreational fisheries in the Bulgarian Black Sea waters, which is based on the opinion of 22 respondents from the pilot study. The importance of this part of the fisheries seems to be questionable, due to the low number of respondents who answered that they are fishing in the Black Sea 22 from 1000 contacted, some of the estimations are considered not very reliable, especially regarding the quantities of red mullet that respondents of the survey provided. From all species that were caught by the recreational fishermen there is only one which is listed in Table 2.4 of the Bulgarian Work Plan – *Sarda sarda*, but the estimated amount for the whole year is just 0.8 tonnes.

In order to ensure continuity of data collection regarding marine recreational fisheries, comparability with the already available data, and ensure the taking of right decisions based on more reliable data Bulgaria will conduct a new survey in 2024. The report from the survey is available at: http://dcf-bulgaria.bg/documents/.

The currently available information is that the species eel (including in fresh water), elasmobranchs and highly migratory ICCAT species, listed in Table 4 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, are not presented in the area, there are no records for catch or landings in the last decades. Statements from our research institutes are available on the Bulgarian DCF wed page – http://dcf-bulgaria.bg/data-collection-methodologies/.

Action to avoid deviations

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

There were no deviations.

In order to ensure continuity of data collection regarding marine recreational fisheries, comparability with the already available data, and ensure the taking of right decisions based on more reliable data Bulgaria will conduct a new survey in 2024.

(max 900 words per region)

Text Box 2.5: Sampling plan description for biological data

(Region/RFMO/RFO/IO: Mediterranean and Black Sea)

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

Sampling scheme name (or identifier): 1XXXXX

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

Additional information regarding the biological monitoring of turbot:

100 individuals per year will be collected - 50 turbot caught in the second quarter and 50 turbot caught in the fourth quarter will be purchased for analysis of gender, age structure determination and stomach content. Based on the collected gonads, the gender, the gonadosomatic index, and the maturity stage will be determined. From the same specimens, samples of otoliths will also be collected to determine the turbot's age. Correlations between the measured parameters are determined. The Gonadosomic Index (GSI,%) will also be determined. The fecundity is determined based on females caught during the breeding season (February-May).

According to the experience gained in previous years, from 100 purchased specimens less than a half are with full stomach, so the planned full stomachs for analysis are 20 full stomachs in the 2nd quarter and 15 a full stomachs in 4th quarter. If more full stomachs are available, they will also be analysed.

Additional information regarding the biological sampling of pelagic species:

Feeding and stomach content analysis of pelagic species from biological monitoring is not planned in the period 2022-2024. Since in the previous period sampling methodology for stomach content has been applied for species landed on shore and the results from the approbation of methodology showed that almost 100 percent of the stomachs were empty. The scientific teams' conclusions regarding the empty stomachs were that all quantities of the landed fish (already dead) is not suitable for further fixation as the stomachs is supposed to be empty and/or gastric contents were heavily digested, and further identification at the species and genus level was not possible. The institutes responsible for gastric content analysis in both Romania (NIMRD) and Bulgaria (IO-BAS) agreed to exclude the stomach content analysis from landings of the present work plan in Bulgarian and Romanian Black Sea marine zone and instead of it, including the stomach content analysis in the PTSBS.

Additional information on sampling schemes

You may add specific contextual information related to a region and the implementation year(s), for instance highlighting new developments not yet detailed in the quality document, regional adaptation and/or

perspectives for the future. Insert the information under the same sampling scheme identifier as in Table 2.5.

According to the agreement between Bulgaria and Romania, both countries will undertake annually biological monitoring in their territorial waters and EEZ under their jurisdiction, following common methodology and harmonization of biological data sampling. The agreement is available at the following link: http://dcf-bulgaria.bg/wp-content/uploads/2021/10/Agreement-on-data-collection-activities-between-Bulgaria-and-Romania-2021-2027.pdf

Additional description of sampling frames

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

The 'Sampling frame description' in Table 2.5 includes information for the type of gears used by the fishing vessels operating in the Black Sea, the target species and ports.

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

Sampling scheme identifier: SciObsOnShore*Commercial fishing trip*Selected species/stocks

Deviations from the work plan

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

There were no deviations.

Actions to avoid deviations

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

No action needed. According to the scientists from the research institutes in Bulgaria, the collection of more samples and the measurement of biological parameters (including stomach sampling) of more individuals than the minimum planned in the work plan (when this is possible and does not cost additional funds) contribute to more reliable and detailed results to be used for stock assessments. In regards to the stomach sampling, the numbers of specimens with full stomach could not be predicted, all the available stomachs were analysed.

Sampling scheme identifier: SciObsAtSea*Commercial fishing trip*All species

Deviations from the work plan

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

No deviations from the WP.

- The information for the stomach sampling is provided in this Text Box, because initially it was included in Text Box 2.5, since there was no other relevant Text Box in which to write it without separating it between the different surveys and sampling schemes (PTSBS, BTSBS and SciObsOnShore*Commercial fishing trip*Selected species/stocks.) The stomach sampling and analysis of *Scophthalmus maximus* from BTSBS were higher than the planned, because there were more available full stomachs than the expected minimum. The stomach sampling and analysis of *Sprattus sprattus* and *Trachurus mediterraneus* from PTSBS were to the initially planned.

Actions to avoid deviations

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

No action needed.

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

Text Box 2.6: Research surveys at sea

(Research survey: Pelagic Trawl Survey in the Black Sea (PTSBS))

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

(Use one text box per survey)

Name of the research survey

Pelagic Trawl Survey in the Black Sea (PTSBS)

1. Objectives of the survey

For mandatory surveys: list the full list of target species/ecosystem components set by the coordinating group (as opposed to the target species provided in Table 1 of the EU MAP Implementing Decision) and the international, and additional national objectives.

For non-mandatory surveys: describe the purpose of the survey including sampling activities and target species/ecosystem components, the end user and how the data are used.

The target species of the pelagic trawl survey in the Black Sea is sprat. According to the list of species caught during the previous pelagic trawl surveys, an analysis of the biomass and abundance of red mullet, anchovy and Mediterranean horse mackerel will also be done, if they exist in the catch.

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

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

PTSBS will be accomplished in June-July and October-November each year. The research survey will be held in the area enclosed between Durankulak and Ahtopol (Bulgaria) with a total length of the coastline of 370 km. The study area encloses waters between 42o05' and 43o45' N and 27o55 and 29o55, Bulgarian waters will be partitioned into 128 equal in size, not overlying fields and during the survey 36 random mid-water hauls will be carried out in the Bulgarian area. The survey undergoes during the day and the following types of data were collected: coordinates and duration of each trawl, sprat total catch weight, separation of the by-catch by species, composition of by-catch, conservation of the samples.

To establish the abundance of the reference species in front of the Bulgarian coast a standard methodology for stratified sampling was employed (Gulland, 1966;). To address the research objectives the region was divided into the following strata according to depth – Stratum 1 (15-35 m) Stratum 2 (35–50 m), Stratum 3 (50–100 m). Each field is a rectangle with sides 5'Lat×5'Long and an area around 62.58 km2 (measured by application of GIS), large enough for a standard lug extent in a meridian direction to fit within the field boundaries. At each of the fields, only one haul with a duration between 30-40 min at speed 2.7-2.9 knots will be carried out. The documentation of the survey design and methods used is available online in English at http://dcf-bulgaria.bg/data-collection-methodologies/ - Methodology for the Pelagic trawl survey in the Bulgarian Black Sea area.

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

In Bulgaria, the pelagic trawl surveys are performed without the participation of other MS, but according to the agreement between Bulgaria and Romania, both countries will undertake annually research surveys in their territorial waters and EEZ under their jurisdiction, following common methodology, harmonization of biological data sampling and analysis and harmonization of stock assessment methods. The agreement is available at the following link: http://dcf-bulgaria.bg/wp-content/uploads/2021/10/Agreement-on-data-collection-activities-between-Bulgaria-and-Romania-2021-2027.pdf

Both countries will follow the methodologies published in their web pages, accomplished by the Technical guidelines for scientific surveys in the Mediterranean and the Black Sea. - FAO Fisheries and Aquaculture Technical Papers No. 641. and methodologies already adopted by other EU countries: MEDIAS HANDBOOK. The pelagic trawl survey results are presented during the MEDIAS meeting.

Since there is no active national scientific vessel the institute responsible for the survey is using a commercial vessel /or scientific vessel owned by a private company/, hired after a public procurement. Due to this, the exact name of vessel will be mentioned in the annual report.

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

The type of participation was marked in Table 2.6 as 'Combination' even though no other MS participate in the pelagic trawl surveys performed in the Bulgarian territorial waters. The

‘Combination’ consists of ‘Financial’, ‘Technical’ and ‘Personnel’, but none of them is a matter of Cost-sharing agreement, because the signed agreement with Romania is only for coordination of methodologies and activities.

(max 450 words per survey)

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

Bulgarian pelagic trawl surveys are coordinated with Romania.

https://www.fisheries-rcg.eu/wp-content/uploads/2024/04/2023_RCG-MedBS-TM-Report_final.pdf

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1680124/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1655328/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1680123/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1609439/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1439089/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1442355/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1440228/

https://www.fao.org/gfcm/data/safs/en/

Bulgaria is taking part in MEDIAS annual meetings and reports:

http://www.medias-project.eu/medias/website/meetingrep.html

Information on the methodology of the pelagic trawl survey is available at the following link: http://dcf-bulgaria.bg/documents/ - under Data Collection Methodologies.

If possible, Romanian scientists are participating in the pelagic research surveys in Bulgaria and Bulgarian scientists are participating in the Romanian pelagic surveys. In 2023 this exchange did not happen, due to the changeable weather and overlapping commitments, but scientists from the responsible institutes are in constant exchange of experience and participate in many joint meetings.

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

The survey indices of relative abundance (in numbers) were derived in order to calculate

the biomass indices in the respective area (EEZ of Bulgaria). The abundance indices were used in further calculations for the tuning files for stock assessment purposes (historical reconstructions of biomass). The maps of the achieved research survey stations are available in Annex 3 - Maps 3.1. – Maps from the pelagic trawl survey 2023.

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

The planned days-at-sea and the number of sampling activities for pelagic trawl survey were carried out within the official time period and the official survey area.

(max. 450 words per survey)

Research survey: Bottom Trawl Survey in the Black Sea (BTSBS)

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

(Use one text box per survey)

Name of the research survey
Bottom Trawl Survey in the Black Sea (BTSBS)

1. Objectives of the survey
For mandatory surveys: list the full list of target species/ecosystem components set by the coordinating group (as opposed to the target species provided in Table 1 of the EU MAP Implementing Decision) and the international, and additional national objectives.

For non-mandatory surveys: describe the purpose of the survey including sampling activities and target species/ecosystem components, the end user and how the data are used.
The target species in the BTSBS are turbot, piked dogfish and whiting. The surveys results will include an estimation of the biomass indexes and density of the species by depth strata.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.
Indicate the time period for the survey (same as in Table 2.6). If documentation of the survey design and methods used is available online in English, you can refer to that documentation.
The BTSBS will be conducted in May-June and November-December each year. To establish the abundance and biomass of turbot, piked dogfish and whiting a standard methodology for stratified sampling (Gulland, 1966; Sparre, Venema, 1998;) will be applied.
The surveyed design will follow the scheme of the previous demersal surveys, e.g. the region will be divided into four strata, depending on the depth – Stratum 1 (15-35 m), Stratum 2 (35-50 m), Stratum 3 (50-75 m) and Stratum 4 (75-100 m). For assessment of abundance and biomass, the surveyed territory is divided into 143 squares, each of them with sides 5 x 5 Nm, area 25 Nm2. The sampling will be carried out at 36 randomly chosen fields (rectangles), situated at a depth between 15-100 m. Each rectangle is with sides 5'Lat

× 5'Long, while the total area is 62.58 km2 (measured by GIS). Each field should be marked with letters and digits for better distinction.
The seabed area covered during a single haul represents a basic measurement unit, considered representative, as turbots do not aggregate in dense assemblages.
The duration of each haul is 60 min at the trawling speed of 2.2-2.6 knots.
The research survey should include the following main activities: bottom trawl sampling, qualitative and quantitative analysis of the catches, identification of biological diversity, biometric measurements, collection of otoliths for age determination of turbot and other demersal species, sampling and analysis of stomach content of turbot for identification of quantity and composition of the consumed food, sampling of gonads, when possible.
The documentation of the survey design and methods used is available online in English at http://dcf-bulgaria.bg/data-collection-methodologies/ - Methodology for the Bottom trawl survey in the Bulgarian Black Sea area.

3. For internationally coordinated surveys, describe the participating Member States/vessels.
In Bulgaria, the bottom trawl surveys are performed without the participation of other MS, but according to the agreement between Bulgaria and Romania, both countries will undertake annually research surveys in their territorial waters and EEZ under their jurisdiction, following common methodology, harmonization of biological data sampling and analysis and harmonization of stock assessment methods. The agreement is available on the following link: http://dcf-bulgaria.bg/wp-content/uploads/2021/10/Agreement-on-data-collection-activities-between-Bulgaria-and-Romania-2021-2027.pdf.
Both countries will follow the methodologies published in their web pages, accomplished by the Technical guidelines for scientific surveys in the Mediterranean and the Black Sea. - FAO Fisheries and Aquaculture Technical Papers No. 641. and methodologies already adopted by other EU countries: MEDITS handbook. The bottom trawl survey results are presented during the MEDITS meeting.
Since there is no active national scientific vessel the institute responsible for the survey is using a commercial vessel /or scientific vessel owned by a private company/, hired after a public procurement. Due to this, the exact name of vessel will be mentioned in the annual report.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.
For Type of participation other than 'Financial' describe the type of participation, and/or the background of the type of participation in more detail.
The type of participation was marked in Table 2.6 as 'Combination' even though no other MS participate in the bottom trawl surveys performed in the Bulgarian territorial waters.
The 'Combination' consists of 'Financial', 'Technical' and 'Personnel', but none of them is a matter of Cost-sharing agreement, because the signed agreement with Romania is only for coordination of methodologies and activities.

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination

group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

https://www.fisheries-rcg.eu/wp-content/uploads/2024/04/2023_RCG-MedBS-TM-Report_final.pdf

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1680124/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1655328/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1680123/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1609439/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1439089/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1442355/

https://www.fao.org/gfcm/technical-meetings/detail/en/c/1440228/

https://www.fao.org/gfcm/data/safs/en/

Information on the methodology of the bottom trawl survey is available at the following link: http://dcf-bulgaria.bg/documents/ - under Data Collection Methodologies.

If possible, Romanian scientists are participating in the bottom research surveys in Bulgaria and Bulgarian scientists are participating in the Romanian bottom surveys. In 2023 one Bulgarian scientist participated in the Romanian survey and one Romanian scientist participated in the Bulgarian bottom trawl survey.

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

IFR Varna conducted two seasonal bottom trawl surveys (in spring and autumn 2023) to obtain data about the turbot biomass and abundance in Bulgarian Black Sea waters. The turbot biomass was estimated at 2132.69 tonnes in July and 1839.82 tonnes in December, and the turbot abundance in the surveyed area was estimated at $1289.06*10^3$ individuals in July and $1029.50*10^3$ individuals in December.

The estimated biomass of whiting in the Bulgarian Black Sea water area was 14322.72 t in July 2023, and its abundance was estimated at $829009*10^3$ specimens. The estimated biomass of the thornback ray was 683.66 tonnes, and its abundance was estimated to be 518.434 specimens. Owing to the small number of Black Sea dogfish specimens caught and the specificity of the distribution of this species, it is difficult to accurately assess its biomass and abundance off the Bulgarian coast of the Black Sea.

Results of the survey are used at national and international level as contribution to analytical stock

assessments of demersal species.

The maps of the achieved research survey stations are available in Annex 3 - Maps 3.2. – Maps from the bottom trawl survey 2023.

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

The planned days-at-sea and the number of sampling activities for bottom trawl survey were carried out within the official time period and the official survey area.

(max. 450 words per survey)

SECTION 4: IMPACT OF FISHERIES ON MARINE BIOLOGICAL RESOURCES

Text Box 4.2: Incidental catches of sensitive species

(Region/RFMO/RFO/IO: Mediterranean and Black Sea)

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

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

The information on incidental catches of sensitive species (Protected, Endangered and Threatened Species - PETs) will be collected on an annual basis by scientific observers onboard the commercial fishing vessels.

The research survey is focused on data collection for the incidental catches of sensitive species by following types of fishing activities:

(1) turbot fishing with gillnets;

(2) pelagic species fishing with pelagic trawl;

(3) rapa whelk fishing with beam trawl;

(4) pelagic and bottom species fishing with polyvalent active and passive gears.

The impact of commercial fishing on PETs will be assessed according to the bycatch rate, estimated for all observed fishing activities.

The major groups of PETs, that will be observed on board of fishing vessels will include: marine mammals, birds, sharks and rays, sturgeons, vunerable benthic species.

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):

The scientific observations of vessels of the Bulgarian fishing fleet will cover 100 fishing days:

• 30 days on fishing vessels with gillnets (GNS);

• 30 days on vessels with pelagic trawls (OTM);

• 20 days on vessels with beam trawls (TBB);

• 20 days - on vessels with polyvalent active and passive gears (PMP).

— 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?

Yes. The assessment was done at national level, since the RCGMed&BS 2021 has planned a workshop to agree at regional level the list of high risk métiers on bycatch by group of sensitive species for 2022. After the workshop the planned list will be revised, if needed.

For the sampling design, the relative risk of bycatch for the different gear types/metiers has been taken into account. The vessels using gillnets (GNS), pelagic trawls (OTM), beam trawls (TBB) and polyvalent active and passive gears (PMP) have priority. The top priorities of the sampling will be:

• Document observations of PETs by different gear types/metiers

• Document catch composition and size, with site specific details and specificity by different gear types/metiers

• Document the amount and proportion of non-targeted species, and their fate/condition at release

• Document bycatch rate by different gear types/metiers and fishing effort locations

The data collected by scientific observers on board of the following types of fishing vessels - gillnets fishery; pelagic trawlers; beam trawlers; vessels with polyvalent active and passive gears are based on the recommendations of FAO (2019a, b)*:

1. Data about the fishing vessels' activity:

• Fishing expedition data

• Departure port

• Arrival port

• Fishing vessel name

• Vessel type

• Vessel length (m)

2. Fishing gears:

• Total number of fishing efforts per expedition

• Depth scale of the fishing activities

3. Basic biological data:

• Total catch weight (target catch + bycatch)

• Target catch weight

• Weight of the bycatch of marine organisms (including PETs)

• Length structure of catch and bycatch species (including PETs)

4. Additional biological data:

• Total weight of the bycatch of industrial species

• Data about sex and age structure of the catches and bycatches (including PETs, if poosible)

For the collected PETs, along with the speceis identification and biological parameters, additional information will be gathered about the condition of the animals (when possible) :

Dead;

A0: Alive (swam away); conditions not determined;

A1: Alive and in good health condition;

A2: Alive; minor injuries/stressed high probability of survival;

A3: Alive; life threatening injuries/severe stress unlikely to survive.

All gathered data will allow analysis and assessment of the relative risk of bycatch for the different gear types/metiers.

*FAO. 2019a. Monitoring discards in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 639. Rome. http://www.fao.org/3/ca4914en/ca4914en.pdf

FAO. 2019b. 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 http://www.fao.org/3/ca4991en/CA4991EN.pdf

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

· Birds were not presented as bycatch during 2017-2020.

• One cetacean species, harbour porpoise (Phocoena phocoena), was caught as bycatch (one specimen) with gillnets in July 2018. Thus, the bycatch rate (specimens/observed days) of harbour porpoise bycatch with GNS was estimated at 0.05 in 2018. Zero bycatches were estimated for 2017 and 2019.

• Two sturgeons' specimens, the beluga sturgeon (Huso huso), were collected as bycatch during 2017 - 2018. One specimen was found as bycatch by beam trawling along the northern shores in August 2017; then, in September 2018, the bycatch (one specimen) resulted in OTM trawling for horse mackerel. The two sturgeons, collected in 2017 - 2018 were alive and were released back into the sea in good condition. The incidence of H. huso bycatch (specimens/observed days) was estimated at 0.05 by TBB during 2017, and to 0.1 by OTM in 2018.

• The bycatch of spiny dogfish (Squalus acanthias) is found in all types of gears, except in OTMs, but vary between 0.1 and 0.9, with highest levels in GNS.

• The bycatch of stingray, (Dasyatis pastinaca) vary between 0.05 -1.85 and is found in all gears, but with the highest rate in GNS fishery.

• The bycatch rate of different PETs vary between the observed gears, but recently the GNS fishery show the high probability to influence PETs.

— What methods are used to calculate the observation effort?

Ideally, sampling fishing trips should be proportional to the fishing effort (number of fishing trips for fleet segments). Thus, the observation effort in the Bulgarian Black Sea, should consider the following basic information:

- Identified major fleet segments (4 major segments, appointed above)

- Total number of active fishing vessels in 2020 is 1 233, but 1 134 of them are from the small-scale fleet (under 12 m) with passive gears only.

- Annual fishing effort for the whole fleet is around 22 000 fishing trips, but 14 000 of them are generated by the small-scale fleet (under 12m) with passive gears only.

Typically, the scientific observation coverage should range from 2 percent to 7 percent (FAO, 2009; ACCOBAMS, 2010), although a minimum level of 0.5 percent is often accepted (FAO 2019 a, 20MARE/2014/19, 2016). A target of 0.5 percent is what might be achieved in some large fisheries monitored under the bycatch monitoring programmes carried out within Regulation (EC) No. 812/2004 (European Union, 2004; Northridge, Kingston and Thomas, 2015).

Taking into account:

- the large role of small scale fishery, with almost 92% fishing vessels with length <12m (most of them, not suitable for scientific observations);

- the number of vessels with less than 5 fishing days per year is 550,

we are applying the proposed 0.5 percent as a minimum level of observation coverage in Bulgarian Black Sea waters, and this should result in allocating 100 fishing days per year respectively.

ACCOBAMS. 2010. Protocol for data collection on bycatch and depredation in the ACCOBAMS region. A standardised methodology for use in the collection of data on Cetacean bycatch and depredation of nets. ACCOBAMS-MOP4/2010/Doc22Rev1. Monaco, Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area. 38 pp.

FAO. 2009. Fishing operations. 2. Best practices to reduce incidental catch of seabirds in capture fisheries. FAO Technical Guidelines for Responsible Fisheries. No. 1, Suppl. 2. Rome, FAO. 2009. 49 pp

FAO (2019a): 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 http://www.fao.org/3/ca4991en/CA4991EN.pdf

FAO (2019b): “Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection”,

MARE/2014/19. 2016. Strengthening regional cooperation in the area of fisheries data collection. Final report to the European Commission on the fishPi project, June. Brussels, Directorate-General for Maritime Affairs and Fisheries (MARE), European Commission.

Northridge, S., Kingston, A. & Thomas, L. 2015. Annual report on the implementation of

Council Regulation (EC) No. 812/2004 during 2014. London, Department for Food, Environment and Rural Affairs (Defra). 41 pp.

The PSU is the fishing trip. The observation effort should be up to 0.5 % of the average number of fishing trips of the previous years in the sampling stratum.

— 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.

Y

FAO (2019a): "Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection" http://www.fao.org/3/ca4914en/ca4914en.pdf and at

http://dcf-bulgaria.bg/data-collection-methodologies/

FAO (2019b): "Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection" http://www.fao.org/3/ca4991en/CA4991EN.pdf and at

http://dcf-bulgaria.bg/data-collection-methodologies/

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

The collected data includes the species composition, quantities, biological parameters and condition of the bycatches of PETS by different gears and metiers, as well as total catch of the target species, catches of other industrial species.

The dynamics of the main catches and bycatches of PETs quantities by months and/or seasons, or by sampling localities will be estimated. Information about the bycatch species composition (including PETs), PETs bycatch rate, size; sex and age structure (if possible).

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

Yes

— 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?

Yes

— 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'?

Yes

Additional information on sampling schemes:

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

NA

Additional description on sampling frames

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

NA

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

Results

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

In 2023, scientific observations of fishing vessels of the Bulgarian fleet covered 100 fishing days – 30 days of vessels with gill nets, 30 days of pelagic trawl vessels, 20 days of beam trawl vessels, and 20 days of polyvalent vessels.

A total of 262 sensitive species, categorised into four main groups, were reported as bycatch in 2023. Turbots, the largest group, accounted for 51.5% of the total number, followed by cartilaginous fish (42.8 %). Acipenseridae comprised 3.8% of the total number, while marine mammals, specifically Ph. phocoena, comprised 1.91%. The beam trawl fishery displayed the highest number of sensitive species (152 individuals, Fig 1b), 69 % of which were turbot. It is worth noting that marine mammals were only encountered in gillnet bycatch, with a bycatch coefficient of 0.17 ind/day and 100 % mortality rate. Acipenseridae, on the other hand, was only found in the beam trawl bycatch, with a bycatch coefficient of 0.5 ind/day. Cartilaginous fish showed the highest bycatch coefficient in polyvalent vessel fisheries at 2.55 ind/day, whereas the lowest number was observed in pelagic trawl fisheries at 0.1 ind/day.

Based on sources: Carpentieri, P.; Nastasi, A.; Sessa, M.; Srour, A.; Eds. 2022. Incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: a review. General Fisheries Commission for Mediterranean Region Studies and Review. No. 101. Rome, FAO. https://doi.org/10.4060/cb5405en; Golemanski V. et al. (ed.), 2015. Red Book of the Republic of Bulgaria. Volume 2. Animals. BAS & Ministry of Education, Sofia; http://e-ecodb.bas.bg/rdb/bg/; and the specific IUCN status of the studied bycatch species in the Bulgarian waters of the Black Sea, we refer seabirds, marine mammals, cartilaginous fish species, turbot, and *Acipenseridae* to the sensitive species group.

1. Observations of the gillnet fishery included fishing segment DFN VL0612. The target catch of the observed gillnets was turbot (*S. maximus*), and the species composition of the bycatch included mainly black mussel (M. galloprovincialis), common stingray (*D. pastinaca*), thornback ray (*R. clavata*), shark (*S. acanthias*), and Rapa whelk (*R. venosa*). Five dead harbour porpoise specimens (*Ph. phocoena*) were found in spring (April) catches. The weight of the bycatch was dominated by black mussels (58.50 %), with smaller amounts of common stingrays (13.44%), porpoises (*Ph. phocoena*) (11.04 %), and tub gurnards (*Ch. lucerna*) - 10.34 %. In this fishery, the bycatch rate of marine mammals, represented by *Ph. phocena* was 0.17 ind/day. The total number of sensitive species collected during the entire study period was 26 specimens from four different species (harbour porpoise, shark, common stingray, and thornback ray), with a high mortality rate.

2. In 2023, studies on the pelagic trawl fishery focused on the catch of sprat and covered two fishing segments: TM VL1218 (one vessel, seven fishing days) and TM VL2440 (five

vessels, 23 fishing days). The total number of sensitive species collected in this fishery was 18, from three different species (shark, thornback ray, and turbot). All specimens were collected alive without any serious injuries. Of the registered sensitive species in bycatch, turbot had the highest bycatch coefficient (T= 0.5 ind/day).

3. In 2023, the beam-trawl Rapa whelk surveys covers two fishing segments, vessels 18 – 24 m long (TBB VL1824, 1 vessel, 10 fishing days) and vessels 12-18 m long (TBB VL1218, 10 fishing days, 2 fishing vessels). The species composition of bycatch in Rapa whelk fishery was diverse, and included 33 species of fish, crustaceans, and mollusks, with a maximum of 17 different species of marine organisms found in beam trawls per day. The most common bycatch was the arc clam *A. kagoshimensis*, in 100% of the daily bycatch, and the stargazer (*U. scaber*), the swimmer crab (*L. vernalis*), and the knot goby (*M. batrachocephalus*) were found in 95 % of daily bycatch. A significant number of sensitive species were collected in the bycatch, including 152 specimens of sturgeons, thornback rays, and turbots. Turbot had the highest share (69 %) of the total number of sensitive species in the bycatch, with a bycatch coefficient of T = 5.25 ind/day.

4. The polyvalent vessel survey covered one fishing segment, PMP VL1218, and was conducted mainly in autumn 2023. Thirty species of marine organisms, mainly fish and crustaceans, were identified as bycatch, and an average of nine different species were registered per day. Greater weever (80% of daily catches) and stargazers (80%) were the most frequent daily bycatches, followed by whiting (65 %), turbot (65 %), and small sized horse mackerel (55 %). The bycatch included the non-native sparid species S. smaris, with an average size of 11.45 cm and weight of 16.29 g. In terms of bycatch quantity, the dominant species were whiting (49 %), common stingrays (13 %), small horse mackerel (11 %), and small seized red mullets (11 %). 66 specimens were registered from the sensitive species group, including common stingrays, thornback rays, and turbots. The common stingray had the highest bycatch coefficient (T = 2.25 ind/day, and the lowest values were registered for the thornback rays, T = 0.3 ind/day.

Deviations from the work plan

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

There were no deviations.

Actions to avoid deviations

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

No action needed.

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

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

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

1. Description of clustering

NA. The data collection scheme used in Bulgaria is Census and the data is collected from each vessel. Clusters are not used for data collection purposes, but for the reporting of economic and social data from segments with less than 5 vessels.

The clustering is based on the aggregation of segments with a fishing technique similar to other segments.

Clustered Segments:

- Drift and/or fixed netters 12-< 18 m*

This Cluster is composed of the segments Drift and/or fixed netters 24-< 18 m (3 vessels) and Drift and/or fixed netters 24-< 40 m (1 vessel), which are with less than 5 vessels, and the segment Drift and/or fixed netters 12-< 18 m (19 vessels). These fleet segments only differ in the length class.

- Vessels using Pots and/or traps 6-< 12 m*

This Cluster is composed of the segment Vessels using Pots and/or traps 0-< 6 m (3 vessels), which is with less than 5 vessels, and the segment Vessels using Pots and/or traps 6-< 12 m (34 Vessels). These fleet segments only differ in the length class.

- Vessels using hooks 6-< 12 m*

This Cluster is composed of the segment Vessels using hooks 12-< 18 m (1 vessel), which is with less than 5 vessels, and the segment Vessels using hooks 6-< 12 m (24 vessels). These fleet segments only differ in the length class.

- Vessels using Polyvalent “passive” gears only 6-< 12 m*

This Cluster is composed of the segment Vessels using Polyvalent “passive” gears only 12-< 18 m (1 Vessel), which is with less than 5 vessels, and the segment Vessels using Polyvalent “passive” gears only 6-< 12 m (9 vessels). These fleet segments only differ in the length class.

- Vessels using active and passive gears 12-< 18 m*

This Cluster is composed of the segment Vessels using active and passive gears 18-< 24 m (3 vessels), which is with less than 5 vessels, and the segment Vessels using active and passive gears 12-< 18 m (14 vessels). These fleet segments only differ in the length class.

- Purse seiners 0-< 6 m*

This Cluster is composed of the segment Purse seiners 6-< 12 m (3 vessels), which is with less than 5 vessels, and the segment Purse seiners 0-< 6 m (8 vessels). These fleet segments only differ in the length class.

- Pelagic trawlers 12-< 18 m*

This Cluster is composed of the segments Beam trawlers 12-< 18 m (1 vessel) and Pelagic trawlers 6-< 12 m (3 vessels), which are with less than 5 vessels, and the segment Pelagic trawlers 12-< 18 m (21 vessels). These fleet segments are clustered because of similar fishing techniques and similar length classes.

- Inactive vessels 12-< 18 m*

This Cluster is composed of the segment Inactive vessels 18-< 24 m (1 vessel), which is with less than 5 vessels, and the segment Inactive vessels 12-< 18 m (8 vessels). These fleet segments only differ in the length class.

2. Description of activity indicator

NA. The activity indicator to divide the fleet segment into different activity levels is not used in Bulgaria.

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

NA. No deviation from RCG ECON definitions. According to the GUIDANCE DOCUMENT FOR THE FISHING FLEET Living document, last updated by PGECON 2020, Alternative methods based on company surveys are allowed for the variables Consumption of physical capital and Value of physical capital. Both variables, Consumption of fixed capital and Value of physical capital are collected through the annual questionnaire as the other economic variables, instead of estimating them by applying the perpetual inventory method (PIM). The reason is that the values derived by the application of PIM were not realistic for the Bulgarian fleet and since the data collection is covering all the vessels (Census) and each owner is providing the most accurate data regarding the specific vessel, at national level was taken a decision of using the realistic values reported by the owners, instead of the estimated theoretical numbers.

(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.
In 2022 there are no vessels in the segment Vessels using hooks 12-< 18 m* which is listed in the Work plan. There were 2 new segments, which were not listed in the Work plan tables: Beam trawlers 6-<12 m* and Beam trawlers 18-< 24 m*.

This segment Beam trawlers 12-< 18 m* was planned to be clustered with Pelagic trawlers 12-18, because there wasn't more relevant segment in 2020, but since there were 6 vessels for 2022 and two additional TBB segments, for reporting the Beam trawlers 12-< 18 m* cluster will be used to represent the 3 segments: TBB VL0612, TBB VL1218 and TBB VL1824, because it is better if TBB segment is clustered with other TBB segments (these 3 segments are using the same fishing technique). The cluster name from cell H23 in Table 5.1 will not the used for reporting, but it is not amended because it is from the WP. The new segments are added in tables 5.1 and 5.2 in grey at the bottom of the tables, below the data from the accepted Work plan.

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

No action needed. We collect economic and social data from each vessel and the achieved sample rate is 100%. Clusters are not used for data collection, but for the reporting of economic and social data from segments with less than 5 vessels.

(max. 900 words)

SECTION 6: ECONOMIC AND SOCIAL DATA IN AQUACULTURE

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

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

1. Description of the threshold application

NA. No threshold is applied. The Bulgarian aquaculture production represents 1.07% of the EU aquaculture, according to the latest EU aquaculture production reported by EUROSTAT. The data collection scheme for the aquaculture enterprises in Bulgaria is Census and the sampling unit is an aquaculture enterprise. The economic and social data collection under DCF is from crucial importance in Bulgaria and it is used not only for answering to the aquaculture data call, but also for different national purposes. The data collection is according to the national legislation and it is not subject to any financial costs.

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

NA. No deviation from RCG ECON definitions.

(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.
There were no deviations from the work plan.

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.
No action needed.
(max. 900 words)

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

General comment: This text box fulfils Article 5(2)(f), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 7 of the EU MAP Delegated Decision annex.

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

The data on fish processing sector is collected to cover all variables agreed at RCG ECON and for continuation and consistency of time series. The economic and social data collection under DCF is from crucial importance in Bulgaria and it is used not only for answering to the processing data call, but also for different national purposes. The data collection is according to the national legislation and it is not subject to any financial costs.

The data collection scheme for the processing enterprises in Bulgaria is Census and the sampling unit is a fish processing enterprise. According to the national legislation (Art. 27a from Fisheries and Aquaculture Act), each owner of processing enterprise which is in the register of the BFSA, or his representative, is required at the beginning of each year (before January 31) to submit economic and social information for the previous year.

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

NA. No deviation from RCG ECON definitions.

(max. 900 words)

Deviations from the work plan

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

There were no deviations from the work plan. In the segment ≥250 there were no enterprises during the preparation of the WP and during the AR reference year. If enterprises appear in the segment during the implementation years of the WP the data will be collected and reported.

Actions to avoid deviations

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

No action needed.

(max. 900 words)

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

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

Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Provide short descriptions where indicated, even if the documentation can be found in English. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. For quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

(Sampling scheme identifier: PTSBS)

MS : Bulgaria
Region: Mediterranean and Black Sea
Sampling scheme identifier: PTSBS
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea
Time period of validity: from 2022 to 2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Pelagic Trawl survey will be accomplished in June - July and October - November each year. The research survey will be held in the area enclosed between Durankulak and Ahtopol (Bulgaria) with a total length of the coastline of 370 km. The study area encloses waters between 42º05' and 43º45' N and 27º55 and 29º55 E. Bulgarian Black Sea waters will be partitioned into 128 equal in size, not overlying fields and during each survey (spring and autumn) 36 random mid-water hauls will be carried out in the Bulgarian area, 72 hauls in total per year. The survey covers the Bulgarian Black Sea waters.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU*), e.g. all national port*days (information present in former Table 4B)*. For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. The main targeted species is sprat (Sprattus sprattus). According to the list of species caught during the previous pelagic trawl surveys, an analysis of the biomass and abundance of red mullet, anchovy and Mediterranean horse mackerel will also be done, if they exist in the catch. The survey area is the Bulgarian Black Sea waters. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being*

listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.

The PTSBS is targeting sprat and other pelagic species in the Black Sea, but in general, all the species which exist in the catch are recorded and assessed.

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

To address the research objectives, the region was divided into the following strata according to depth – Stratum 1 (15-35 m), Stratum 2 (35–50 m), Stratum 3 (50–100 m). The stratification is based on scientific experience and historical pelagic trawl surveys.

Sampling design and protocols

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

To establish the abundance of the reference species in front of the Bulgarian coast a standard methodology for stratified sampling was used (Gulland, 1966;). To address the research objectives the region was divided into four strata according to depth – Stratum 1 (15-35 m) Stratum 2 (35–50 m), Stratum 3 (50–100 m). Each field is a rectangle with sides 5' Lat × 5' Long and area around 62.58 km^2 (measured by application of GIS), large enough for a standard lug extent in a meridian direction to fit within the field boundaries. At each of the fields, only one haul with a duration between 30-40 min at speed 2.7-2.9 knots will be carried out. The research survey includes all fractions of catch.

The length classes regarding the stomach content analysis of sprat described in the STREAM deliverable 4.1 will be used (<8 cm and >8 cm). 100 full stomachs will the analysed from sprat <8 cm and 100 full stomachs of sprat over 8 cm. The length classes of Mediterranean horse mackerel described in the STREAM deliverable 4.1 will be used (<10 cm and >10 cm). 50 full stomachs will the analysed from Mediterranean horse mackerel <10 cm and 50 full stomachs of Mediterranean horse mackerel >10 cm. The numbers are agreed between Bulgaria and Romania.
The main reference documents are:
Deliverable D4.1 from STREAM
Methodology for the pelagic trawl survey in the Bulgarian Black Sea area
Both documents are available at http://dcf-bulgaria.bg/data-collection-methodologies/

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

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

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement, but according to the agreement between Bulgaria and Romania, both countries will undertake annually research surveys in their territorial waters and EEZ under their jurisdiction, following common methodology, harmonization of biological data sampling and analysis and harmonization of stock assessment methods. The results from the pelagic trawl survey are presented during the MEDIAS meeting and all relevant GFCM data preparation meetings and stock assessment meetings.

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

The sampling design documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. The sampling design is in line with international recommendations.

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

The sampling protocol documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. The sampling protocol is in line with international recommendations.

Sampling implementation

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

NA

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

The number of stations could vary depending on the specific adjustments related to the increase of the number of hauls in specific areas depending on currents, hydrometeorological conditions at the local station etc.

Data capture

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

Part of the available measuring instruments and software used in IO-BAS (responsible for the pelagic trawl survey) are:
KERN ALJ-160-4NM: Ioniser to neutralise electrostatic charge for fixed installation in the analytical balance;
6inch 150mm Electronic Digital Caliper Ruler Carbon Fiber Vernier;
CX31 Upright Microscope+ digital camera USB3.0;
Kern CH 50K100 Hanging Scales 50kg;
Olympus CX 31RTSF-6 microscope;
MATLAB. Version 2020a, Computer Software. MATLAB – MathWorks, The Math Works, Inc. (2020);
RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL RStudio | Open source & professional software for data science teams. RStudio Team (2020);
Participatory Fisheries Stock Assessment (ParFish) Software;
Yield Version 1.0;
The Catch Effort Data Analysis package (CEDA);
The Length Frequency Distribution Analysis (LFDA);
XLSTAT.





The data recorded and samples collected at each haul include (Gulland,1966):

- Depth, measured by the vessel's echo sounder
- GPS coordinates of start/end haul points
- Haul duration
- An abundance of sprat caught
- Weight of total sprat catch
- Abundance and weight of other large species
- Species composition of by-catch

Laboratory analyses

The samples collected onboard were processed in a laboratory for the determination of age and food composition.

The age will be established in otoliths under the binocular microscope.

The food spectrum will be determined by the separation of the stomach contents into taxonomic groups identified to the lowest possible level.

4% Formaldehyde solution with marine water is used for the conservation of sprat for stomach content examination.

Statistical analyses

Swept area method - the method is based on trawling across the seafloor (area swept), weighted with chains, rock-hopper, and roller gear, or steel beams. Widely used a direct method for demersal species stock assessment (Foote,1996).

http://io-bas.bg/en/biological-laboratories/

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

The data capture documentation is available on the following link:

http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. IO-BAS followed internal rules adopted in the institute to meet the quality of the data processed and analysed. The following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/ describes these rules adopted in the IO-BAS:
Methodology for the Pelagic trawl survey in the Bulgarian Black Sea area;
Guidelines on Data Quality Assurance and Data Quality Control - (Example has been given with the anchovy with remark that all measures proposed are valid for all small pelagic species in Bulgarian marine area);
GFCM-DCRF-manual;
Best practice guideline on scientific surveys and holistic methods in the Black Sea;
Manual of protocols on methods used for assessing fish stocks in the Black Sea by analytic methods;
Technical guidelines for scientific surveys in the Mediterranean and the Black Sea.

Data storage

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

NA. The raw data and the relevant datasets are stored by the Institute of Oceanology. Their database is not accessible through a website.

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

The data collected during the pelagic trawl survey is available in the GFCM-DCFR platform and JRC databases.

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/
Information for the already validated data by GFCM is available at https://www.fao.org/gfcm/data/safs

Sample storage

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

Hard parts as otoliths are preserved at the time of age reading by 3 independent readers. Stomach and zooplankton samples are stored in the zooplankton laboratory (4% Formaldehyde solution) at the Institute of Oceanology-BAS premises.

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

Data processing

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

Y. The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. Editing and imputation documentation is available in the Institute of oceanology, which is conducting the pelagic trawl survey. At IO-BAS editing and imputation of the technical and scientific reports are performed by 4 members of the scientific team.

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

The only document with DOI, which we are using as reference is the Technical guidelines for scientific surveys in the Mediterranean and the Black Sea. - FAO Fisheries and Aquaculture Technical Papers No. 641. https://doi.org/10.4060/ca8870en. The rest of the documents do not have a digital object identifier.

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

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

R software checks and BioIndex checks, so all stages of work are validated:
Running and interpreting scripts developed in R on sampling optimization;
Running quality checks on datasets and interpreting outputs in R;
Running programme BioIndex with output result;
Participation in GFCM and MEDIAS meetings for data preparation and analysis of data from pelagic trawl surveys in the Black Sea.

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

There were no deviations.

Sampling scheme identifier: BTSBS

MS : BGR

Region: Mediterranean and Black Sea

Sampling scheme identifier: BTSBS

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: from 2022 to 2024

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

The bottom trawl survey will be conducted in May-June and November-December each year. To establish the abundance and biomass of turbot, piked dogfish and whiting a standard methodology for stratified sampling (Gulland, 1966; Sparre, Venema, 1998;) will be applied. Bulgarian waters will be partitioned into 143 equal in size, not overlying fields and during each survey (spring and autumn) 36 random mid-water hauls will be carried out in the Bulgarian area, 72 hauls in total per year.

The research survey covers the Bulgarian Black Sea waters.

Description of the population

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

The target species for the BTSBS are:

- Turbot (Scophthalmus maximus) – all available catch during the survey;
- Spiny dogfish (Squalus acanthias) - all available catch (rare occurrence);
- Whiting (Merlangius merlangus) - ichthyological samples will be taken from random hauls

The bycatch species (like the thornback ray (Raja clavata) and the European flounder (Platichthys flesus)) will be measured and analysed. All the species which are caught during the BTSBS will also be analysed.

The research survey area is the Bulgarian Black Sea coast.

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

The main target species from the BTSBS are the demersal species turbot (Scophthalmus maximus), whiting and piked dogfish, as well as information for all species, gathered as bycatch, during the survey.

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

To establish the abundance and biomass of the reference species of the Bulgarian Black Sea coast, a standard methodology for stratified sampling (Gulland, 1966; Sparre, Venema, 1998) will be applied.

The surveyed region will be divided into four strata, depending on the depth – Stratum 1 (15-35 m), Stratum 2 (35-50 m), Stratum 3 (50-75 m) and Stratum 4 (75-100 m). For assessment

of turbot, whiting and piked dogfish abundance and biomass, the surveyed territory will be divided into 143 squares. The sampling will be carried out at 36 randomly chosen fields (rectangles) in the spring and 36 in autumn, situated at a depth between 15-100 m. Each rectangle is with sides 5'Lat × 5'Long, while the total area is 62.58 km2 (measured by GIS). Each field will be marked with letters and digits for better distinction.
The seabed area covered during a single haul represents a basic measurement unit, considered representative, as turbots do not aggregate in dense assemblages (Martino, Karapetkova, 1957).

Sampling design and protocols

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

Full coverage of the information is envisaged for all collected specimens of the target species - absolute and standard length, the weight of specimens, otoliths for age determination, turbot stomachs for stomach content analysis, and by-catch species composition.
The stomach composition data will be analyzed for as much as possible full stomachs, but we could not assure strict distribution of the collected samples by fish length classes. The minimum which is planned (according to numbers of specimens with full stomachs during the historical bottom trawl surveys) is 15 in the 2nd quarter and 15 in the 4th quarter. The number is agreed between Bulgaria and Romania. If more full stomachs are available during the research surveys, they will be analysed.
The main reference documents are:
Deliverable D4.1 from STREAM
Methodology for the Bottom trawl survey in the Bulgarian Black Sea area
Both documents are available at http://dcf-bulgaria.bg/data-collection-methodologies/
Selected species/stocks were added in the Sampling scheme identifier to be consistent with Table 2.2, Table 2.5, Text box 2.5 and Annex 1.1.
For the other demersal species – weight and length measurements will be performed on all catches (if possible the sex and age of the bycatch species will be estimated).

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

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

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement, but according to the agreement between Bulgaria and Romania, both countries will undertake annually research surveys in their territorial waters and EEZ under their jurisdiction, following common methodology, harmonization of biological data sampling and analysis and harmonization of stock assessment methods. The results from the bottom trawl survey are presented during the MEDITS meeting and all relevant GFCM data preparation meetings and stock assessment meetings.

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

The sampling design documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/

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

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication – e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.
The sampling protocol documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/

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

Sampling implementation

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

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?
The number of stations could vary depending on the specific adjustments related to the increase of the number of hauls in specific areas depending on currents, hydrometeorological conditions at the local station etc.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what the means for collecting the data are, e.g. scales, measuring board, dedicated software etc.
Part of the available measuring instruments and software used in IFR (responsible for bottom trawl survey) are:
Precision scale Kern KB 360-3N, 360 g, Precision: 0.001 g;
Precision scale Kern KB 3600-2N, 3600 g, Precision: 0.01 g;
Scales with hook Kern HDB 5K5N, 5 kg;
Scales with hook Kern HDB 10K10N 10 kg;
LAB13_10447197- Stereo microscope Leica EZ 4;
Stereo microscope OLIMPUS SZ51;
Stereo microscope OLIMPUS SZ61;
Statistical program for fish parameters calculation and stomach content analysis:
The Catch Effort Data Analysis package (CEDA);
The Length Frequency Distribution Analysis (LFDA);
Yield Version 1.0;
FiSAT (FiSAT II);
PRIMER;
XLSTAT.



To ensure accurate measurements, the laboratory and sea equipment should be kept in good condition, scales and microscopes should be regularly calibrated and checked (preferably yearly by a qualified technician).
The sea protocols for each sample include a full description of all measurements. IFR-Varna keeps the protocols from the observations in xls files. All biological data, produced in a sea and laboratory, should be completely documented and should be traceable back to its origin. The necessary documentation contains a description of sampling equipment and procedures, reference to standard operating procedures (SOP) for sample handling and analytical procedures involved. Data files are kept on several devices and are updated synchronously.



The catch from all hauls must be fully sorted where practicable. The entire catch is sorted, with fish, shellfish species identified to the lowest taxonomic level possible. For larger catches, a selection of species/size categories of species may be identified as being sufficiently abundant that they can be subsampled appropriately. All fish from target and demersal bycatch species will be measured (length, weight by sex).

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

Internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) are applied in IFR, including all steps of marine data collection and analysis – from the planning of the sea expedition to final reporting. For example, all data, collected in the sea, are included in protocols and checked by two different persons for mistakes (scientist and expedition leader) and all samples are numbered and identified by given rules. If any corrections are needed, they are presented in separate protocols, controlled by two scientists.

Scientific data are kept in the form of xls files, as specific technical reports are prepared every six months and on yearly basis, regarding the evolution of the main parameters of the stock, biomass assessments, catch projections, size, age composition, maturity, physical condition etc. and are kept on two different computers, with copies on CD and flash memories.
The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. IFR followed internal rules adopted in the institute to meet the quality of the data processed and analysed. The following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/ describes these rules adopted in the IFR:
Methodology for the Bottom trawl survey in the Bulgarian Black Sea area;
Guidelines on Data Quality Assurance and Data Quality Control;
GFCM-DCRF-manual;
Best practice guideline on scientific surveys and holistic methods in the Black Sea;
Manual of protocols on methods used for assessing fish stocks in the Black Sea by analytic methods;
Technical guidelines for scientific surveys in the Mediterranean and the Black Sea.

Data storage

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

NA. The raw data and the relevant datasets are stored by the Institute of fish resources. Their database is not accessible through a website.

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

The data collected during the bottom trawl survey is available in the GFCM-DCRF platform and JRC databases.

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/
Information for the already validated data by GFCM-DCFR is available at https://www.fao.org/gfcm/data/safs

Sample storage

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

The hard structures - otoliths, for age readings, are stored for 2 years in the IFR - Varna.
In general, the internal protocols for age reading in IFR include standard procedures for:
- otoliths sampling (stratified by size range, season, sex, etc.);
- preparation for analysis (sections, clarifying mediums, etc.);

- otoliths reading (image-analysis systems, filters, lighting, magnification, etc.);
- establishing accuracy and precision.
-sample storage.

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/ and https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

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

Y. http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. Editing and imputation documentation is available in the Institute of fish resources, which is conducting the bottom trawl survey. At IFR editing and imputation of the technical and scientific reports are approved by two different persons (scientist and expedition leader).

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

The only document with DOI, which we are using as reference is the Technical guidelines for scientific surveys in the Mediterranean and the Black Sea. - FAO Fisheries and Aquaculture Technical Papers No. 641. https://doi.org/10.4060/ca8870en. The rest of the documents do not have digital object identifier.

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

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

For the Data quality checks of the research survey, IFR-Varna uses MEDITS protocol. It includes common formats for data storage, which include the following standard files: TA (data on the technical specifications of the hauls), TB (aggregated data on the total number and weight by species), TC (aggregated data of the frequency distribution by length, sex and maturity stage by species). To perform automatically the data check procedure by means of a routine enabling errors to be detected and facilitating their correction, the RoME routine, an R code for performing multiple and cross-checks on survey data in TA, TB, TC format. RoME was transformed into a package structured in 55 different functions: the run is performed by means of the function RoME. Each function is related to a specific check and is recalled in a specific order to avoid cascade errors.

Running programme BioIndex with output result: maps and tables that include data related to: * the surface of the researched square (Km^2, m^2); * the average mass per unit area (g/m^2,

t/Km^2); * the mass limits variation per unit area; * the total biomass values (t); * the abundance index (individuals/km^2). Participation in GFCM and MEDITS meetings for data preparation and analysis of data from demersal trawl surveys in the Black Sea.
AR comment: Indicate any deviations. Do not change the text already adopted in the work plan. There were no deviations.

Sampling scheme identifier: SciObsOnShore*Commercial fishing trip*Selected species/stocks

MS : BGR
Region: Mediterranean and Black Sea
Sampling scheme identifier: SciObsOnShore*Commercial fishing trip*Selected species/stocks
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: from 2022 until 2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* The sampling scheme aiming to collect the following information from commercial landings at national ports: - length, weight, sex, age, maturity, fecundity and stomach sampling of Scophthalmus maximus collected from vessels using GNS for turbot fisheries in GSA 29, which are landing at officially designated ports for turbot; - length, weight, sex, age, maturity and fecundity for Sprattus sprattus, Mullus barbatus, Trachurus mediterraneus, Engrauslis encrasicolus, Merlangus merlangius from vessels using OTM, targeting pelagic species; - length, weight, sex and maturity for Squalus acanthias from vessels using LLS and/or LLD; - length, weight and sex for Rapana Venosa from vessels using TBB targeting rapa whelk. The scheme covers Bulgarian landings at national ports.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU*), e.g. all national port*days (information present in former Table 4B)*. For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. The primary sampling units are commercial fishing trips. The samples for the analysis will be collected directly from the Bulgarian landing ports. The sampling will remain the same as in previous years – it will be done by purchasing samples at the time of landings at the ports. The target population consists of fishing trips of vessels using pelagic trawls, vessels using beam trawls, vessels using longlines and vessels with set (anchored) gillnets for turbot. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.

All parts of the target population have the same chance to be sampled and there are no parts of the target population, which are unreachable for sampling or excluded for some reason.
The samples collection will be carried out quarterly.
The method of PSU selection will be simple random sampling without replacement (SRSWOR)
http://home.iitk.ac.in/~shalab/sampling/chapter2-sampling-simple-random-sampling.pdf

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

There is no specific geographical stratification since the PSU is a commercial fishing trip.

Sampling design and protocols

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

To ensure that the data collected provides representative information, samples from the planned species are collected from different landing ports of the Bulgarian Black Sea coast. Each fishing vessel, which is landing at the port during the day in which the data collector is there has an equal and independent probability of being observed. The sampling scheme applies for catch fraction based on Landings (all).
The method of PSU selection is simple random sampling with replacement (SRSWR)
http://home.iitk.ac.in/~shalab/sampling/chapter2-sampling-simple-random-sampling.pdf

The minimum number of full stomachs of turbot which is planned (according to numbers of specimens with full stomachs during the historical biological monitoring of turbot) is 20 in the 2nd quarter and 15 in the 4th quarter. If more full stomachs are available from the purchased samples, they will be analysed.
The main reference documents are:
Deliverable D4.1 from STREAM
Methodologies for the biological sampling in the Bulgarian Black Sea area
Both documents are available at http://dcf-bulgaria.bg/data-collection-methodologies/

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

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 Member States participating.

The sampling design and protocols were not developed as part of a regional or multi-lateral agreement, but according to the agreement between Bulgaria and Romania, both countries will undertake annually biological monitoring in their territorial waters and EEZ under their jurisdiction, following common methodology and harmonization of biological data sampling. The agreement is available at the following link: http://dcf-bulgaria.bg/wp-content/uploads/2021/10/Agreement-on-data-collection-activities-between-Bulgaria-and-Romania-2021-2027.pdf

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

The sampling design documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/

and
"Report of the Workshop on Sampling and Calculation Methodology for Fisheries Data" (WKSCMFD) (ICES 2004); https://www.ices.dk/sites/pub/CM%20Doccuments/2004/ACFM/ACFM1204.pdf
Report SGPIDS (ICES, 2011a), https://www.ices.dk/community/Documents/PGCCDBS/SGPIDS%202011.pdf
Report of the Study Group on Practical Implementation of Discard Samples (SGPIDS).2013, https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/SGPIDS/SGPIDS13.1.pdf

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

Y. The sampling design is in line with international recommendations.

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

The sampling protocol documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y.

Sampling implementation

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

Y. The refusal rate should be recorded, but it is not likely to happen because scientists are buying the samples.

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

Annual plans for the collection of samples from the commercial fisheries are prepared in each institute responsible for the pelagic species (IO-BAS), turbot (IFA) and rapa whelk (IFR). So far we did not have a situation in which the sampling allocations needed to be adjusted.

Data capture

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

The biological monitoring is performed by three different institutes, so their means for data collection are various, but below you can find a short list for each institute.

Part of the available measuring instruments and software used in IFR (responsible for the rapa whelk monitoring) are:
Precision scale Kern KB 360-3N, 360 g, Precision: 0.001 g;
Precision scale Kern KB 3600-2N, 3600 g, Precision: 0.01 g;
Scales with hook Kern HDB 5K5N, 5 kg;
Scales with hook Kern HDB 10K10N 10 kg;

LAB13_10447197- Stereo microscope Leica EZ 4;
Stereo microscope OLIMPUS SZ51;
Stereo microscope OLIMPUS SZ61;
Part of the statistical programs used in the Institute:
The Catch Effort Data Analysis package (CEDA);
The Length Frequency Distribution Analysis (LFDA);
Yield Version 1.0;
FiSAT (FiSAT II);
PRIMER;
XLSTAT.




Part of the available measuring instruments and software used in IO-BAS (responsible for the monitoring of pelagic species) are:
KERN ALJ-160-4NM: Ioniser to neutralise electrostatic charge for fixed installation in the analytical balance;
6inch 150mm Electronic Digital Caliper Ruler Carbon Fiber Vernier;

CX31 Upright Microscope+ digital camera USB3.0;
Kern CH 50K100 Hanging Scales 50kg;
Olympus CX 31RTSF-6 microscope;
MATLAB – MathWorks - The Math Works, Inc. (2020). MATLAB. Version 2020a;
RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL RStudio | Open source & professional software for data science teams, RStudio Team (2020);
Participatory Fisheries Stock Assessment (ParFish) Software;
Yield Version 1.0;
The Catch Effort Data Analysis package (CEDA);
The Length Frequency Distribution Analysis (LFDA);
XLSTAT.





http://io-bas.bg/en/biological-laboratories/

Part of the available measuring instruments and software used in IFA (responsible for the monitoring of turbot) are:
Digital balance Kern AEG (min-0.01 g; max-220 g; e=0.001 g;
binocular stereomicroscope (Ceti model);
trinocular microscope model MAGNUM T;
Growth II Pisces Conservation Ltd. 2006.
Detailed information for the means for collecting the data is available in the Methodology for biological sampling in the Bulgarian Black Sea area document, available at http://dcf-bulgaria.bg/data-collection-methodologies/.

To ensure accurate measurements, the laboratories equipment in each of the 3 institutes is kept in good condition, scales are regularly calibrated and checked by a qualified technician.
The laboratory protocols for each sample include a full description of all measurements. All biological data, collected at landing ports or in the laboratory is completely documented and should be traceable back to its origin. The documentation contains a description of sampling equipment and procedures, reference to standard operating procedures (SOP) for sample

handling and analytical procedures involved.

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

The data capture documentation is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/
in the files Methodologies for biological sampling in the Bulgarian Black Sea area, in the GFCM-DCRF manual and in the quality documents;
https://mrag.co.uk/resources/fisheries-assessment-software
Estimation of sex of Rapana venosa is based on the following paper: Bondarev, 2015, Sexual differentiation and variations sexual characteristics Rapana venosa (Valenciennes, 1846), International Journal of Marine Science, Vol.5, No.19 1-10 (doi: 10.5376/ijms.2015.05.0019
https://www.researchgate.net/publication/277553129_Sexual_differentiation_and_variations_sexual_characteristics_Rapana_venosa_Valenciennes_1846

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

Y. Each institute involved in the biological monitoring of Bulgarian landings followed internal rules adopted in the institute to meet the quality of the data processed and analysed. The following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/ describes these rules:
Methodologies for biological sampling in the Bulgarian Black Sea area;
Guidelines on Data Quality Assurance and Data Quality Control - (Example has been given with the anchovy with a remark that all measures proposed are valid for all small pelagic species in Bulgarian marine area);
GFCM-DCRF-manual;
Best practice guideline on scientific surveys and holistic methods in the Black Sea;
Manual of protocols on methods used for assessing fish stocks in the Black Sea by analytic methods.

Data storage

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

NA

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

GFCM database /DCRF platform/ and in JRC database /Mediterranean and Black sea data call/.

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

The documentation for quality checks and data validation information is available on the following link:
http://dcf-bulgaria.bg/data-collection-methodologies/
Internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) are

applied in each institute, including all steps from the collection of samples to final reporting and data storage.

Sample storage

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

Each institute is responsible for the storage of the samples of the different species and the samples are not stored under the auspices/responsibility of an international organisation. The samples from turbot are stored in IFA, samples from rapa whelk are stored in IFR and samples from pelagic species are stored in IO-BAS. Part of samples (already processed) are frozen and kept for internal data quality checks (on an annual basis).
The collected samples from turbot are stored at the Institute of Fisheries and Aquaculture. Samples for determining the fecundity of turbot, which are taken and examined in the 2nd quarter of each year, are stored in a 4% solution of formaldehyde in plastic containers for 4 years. Each sample is numbered and labelled. Samples from each pair of otoliths, immediately after removal from the fish are washed and stored in plastic eppendorphs in 96% ethyl alcohol. The samples of the stomachs immediately after their removal are inserted in plastic containers in 4% solution of formaldehyde for further analysis. The soft tissue samples are stored in 40% formalin. All samples are labelled and numbered in the order in which the fish are dissected and are stored for 4 years.
Rapa whelk shells are stored for 2 years in the laboratories of IFR.
Preservation of fish samples in IO-BAS:
1. Cooling is one of the methods used to preserve fish samples;
2. Freezing samples - on board and subsequently placed in a freezer at institute laboratories;
Freezing and cooling led to different effects on morphological characters. In the case of freezing, a degradation in colour from goldish-brown to grey-blackish was visible in every case, while the body shape was unaffected overall, except for the belly being less elevated, soft and pliable after defrosting.
Otolith preparation and analysis - Sagittal otoliths were removed, as were the large pieces of remaining tissue, using tweezers, before being placed in water-filled eppendorfs to soak overnight. If tissue remained after this, otoliths were either left to soak in eppendorfs filled with a 1% solution of potassium hydroxide overnight or a 3% solution of potassium hydroxide for 5 h before being washed in water. Otoliths were then dried overnight before being photographed using the Olympus Trinocular Stereomicrscope at 6.3× magnification with an attached Olympus DP25 camera equipped with the imaging system cell^a. An image was taken of the interior and exterior of both the left and right otoliths. Using the same imaging software, measurements (μm) on the exterior side were taken of otolith length – the longest distance between the most anterior and posterior points - (OL) and otolith width – the longest distance between the ventral and dorsal edges - (OW), with the measurements for OL and OW perpendicular to each other. Otoliths were then can be weighed to the nearest 0.001 g – otolith mass – (OM).
Hard parts as otoliths are preserved at the time of age reading by 3 independent readers.

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

Information about the sample analysis is available in the following documents available at

http://dcf-bulgaria.bg/data-collection-methodologies/
and
Bondarev, 2015, Sexual differentiation and variations sexual characteristics Rapana venosa (Valenciennes, 1846), International Journal of Marine Science, Vol.5, No.19 1-10 (doi: 10.5376/ijms.2015.05.0019
https://www.researchgate.net/publication/277553129_Sexual_differentiation_and_variations_sexual_characteristics_Rapana_venosa_Valenciennes_1846

Data processing

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

Y. Information about the data accuracy is available in the following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/
and
The precision of the sampling program is based on the requirements of the following reports:
"Sampling Calculation and Methodology for Fisheries Data" (WKSCMFD) (ICES 2004) - https://www.ices.dk/sites/pub/CM%20Doccuments/2004/ACFM/ACFM1204.pdf
Report of the Study Group on Practical Implementation of Discard Sampling Plans (SGPIDS) (ICES, 2011a) - https://www.ices.dk/community/Documents/PGCCDBS/SGPIDS%202011.pdf

The morphometric relationships between the biological parameters - total weight (TW), shell length (SL), shell width (Wd), aperture length (AL) are analysed on the basis of classical allometric models. The least squares method will be used to estimate the linear - weight relationships (LWR), based on the following equation:
$W=a\times L^{\wedge b}$, where, W – weight; L – length; a, b – constants.
The XLSTAT software is be used to display the linear-weight histograms of the samples from the *Rapana* landings. The statistical data about the different length and weight classes, presented in the histograms, include lower and upper limits, frequency, relative frequency, and density.
Summarized statistics (Mean values, Standard Error, Median, Mode, Standard Deviation, Sample Variance, Kurtosis, Skewness, Range, Minimum, Maximum, Confidence Level, 95.0%) about the measured biological parameters of *Rapana* by ports - Total weight (TW - weight with shell, TW, g), body weight (BW, g), % of BW from TW, shell length (shell length, SL, mm), shell width (Wd, mm) and aperture length (AL, mm) will be presented separately, where relevant.

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

Internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) are applied in each institute, including all steps from data collection and analysis to final reporting. For example, all data, collected in the sea, are included in protocols and checked by a different number of scientists in each institute for mistakes (scientist and expedition leader) and all samples are numbered and identified by given rules. If any corrections are needed, they are presented in separate protocols, controlled by two scientists in IFR. At IO-

BAS editing and imputation of the technical and scientific reports is being conducted by 4 members of the scientific team. At IFA editing and imputation of the technical and scientific reports is being conducted by 2 members of the scientific team.
http://dcf-bulgaria.bg/data-collection-methodologies/

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

Y. Information about the data accuracy is available in the following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/:
Methodologies for biological sampling in the Bulgarian Black Sea area;
GFCM-DCRF-manual;
Best practice guideline on scientific surveys and holistic methods in the Black Sea;
Manual of protocols on methods used for assessing fish stocks in the black sea by analytic methods;
Technical guidelines for scientific surveys in the Mediterranean and the Black Sea - Procedures and sampling for demersal (bottom and beam) trawl surveys and pelagic acoustic surveys;
Guidelines on Data Quality Assurance and Data Quality Control;
and
"Sampling Calculation and Methodology for Fisheries Data" (WKSCMFD) (ICES 2004) - https://www.ices.dk/sites/pub/CM%20Doccuments/2004/ACFM/ACFM1204.pdf
Report of the Study Group on Practical Implementation of Discard Sampling Plans (SGPIDS) (ICES, 2011a) - https://www.ices.dk/community/Documents/PGCCDBS/SGPIDS%202011.pdf

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

Internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) are applied in each institute, including data labelling, checks on final protocols, reanalysis of samples at annual basis etc. The laboratory data and data analyses are finally cross-checked by different number of scientists according to the institute and the exact monitoring program (project leader and lab leading scientists). The data accuracy, relevancy, completeness and timeliness are executed and checked by the researchers in each institute.

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

There were no deviations.

Sampling scheme identifier: SciObsAtSea*Commercial fishing trip*All species

MS : BGR

Region: Mediterranean and Black Sea

Sampling scheme identifier: SciObsAtSea*Commercial fishing trip*All species

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2024

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

The research survey performed by observers on board aims at data collection for incidental catches of sensitive species (PETs) by different types of fishing activities of the Bulgarian fisheries' fleet, as the following types of fishing vessels will be observed:
(1.) turbot fishing with gillnets;
(2.) pelagic species fishing with pelagic trawl;
(3.) Rapana fishing with beam trawl;
(4.) pelagic and bottom species fishing with polyvalent active and passive gears.
The major groups of PETs, that will be observed on board of fishing vessels will include: marine mammals, birds, sturgeons, sharks and rays, vulnerable benthic species,

The main priorities of the sampling will be:

• Document observations of PETs by different gear types/metiers

• Document catches composition and size, with site specific details and specificity by different gear types/metiers

• Document the amount and proportion of non-targeted species (including PETs), and their fate/condition at release

• Document bycatch rate by different gear types/metiers and fishing effort locations

The collected data includes the species composition, quantities, biological parameters and condition of the bycatches of PETS by different gears and metiers, as well as total catch of the target species, catches of other industrial species. The dynamics of the main catches and bycatches of PETs quantities by months and/or seasons, or by sampling localities will be estimated. Information about the bycatch species (including PETs) composition, PETs bycatch rate, size, sex and age structure (if possible).

The impact of commercial fishing will be assessed according to the indicator values of the bycatch rate of PETs for the observed fishing activities.
The sampling scheme covers Black Sea waters.

Description of the population

Population targeted: Specify which are the primary sampling units (PSU*), e.g. all national port*days (information present in former Table 4B)*. For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.
PSUs are fishing days.
The scientific observations of vessels of the Bulgarian fishing fleet should cover 100 fishing days - 30 days on fishing vessels with gillnets, 30 days on vessels with pelagic trawls, 20 days on vessels with beam trawls and 20 days – on vessels with polyvalent active and passive gears.

Population sampled: Specify which part of the target population will be sampled and specify which part of the

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

All parts of the target population have equal chances of being observed and there is no part of the population that is unreachable.

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

There is no specific geographical stratification since the PSU is a commercial fishing trip in the Bulgarian Black Sea waters.

Sampling design and protocols

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

Fishing days will be considered as the main unit, used in the observations.

To ensure that data collected provide representative information and sampling for all planned fleet segments distribution of fishing days that will be observed is planned and described in the short description above. The primary sampling units commercial fishing days have an equal and independent probability of being observed.

Simple random sampling without replacement (SRSWOR) is planned.

http://home.iitk.ac.in/~shalab/sampling/chapter2-sampling-simple-random-sampling.pdf

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

Y

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 Member States participating.

The sampling design and protocols follow the recommendation of FAO, applicable for the Mediterranean and Black Sea fisheries research:

FAO (2019a): "Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection" http://www.fao.org/3/ca4914en/ca4914en.pdf

FAO (2019b): "Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection" http://www.fao.org/3/ca4991en/CA4991EN.pdf

Both documents are also available at http://dcf-bulgaria.bg/data-collection-methodologies/

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

Documentation for the sampling design is available in the following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/:

Methodologies for biological sampling in the Bulgarian Black Sea area;

Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection;

Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection.

and

http://www.fao.org/3/x8923e/x8923e.pdf

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

Y

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

Documentation for the sampling protocol is available in the following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/:
Methodologies for biological sampling in the Bulgarian Black Sea area;
Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection;
Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection.

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

Y

Sampling implementation

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

Y

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

Annual plans for the scientific activities on board of fishing vessels is prepared and in case of delays from planned activities they should be performed in a short period, to ensure full coverage of the fishing operations observations during the active seasons.

Data capture

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

Part of the available measuring instruments and software used in IFR (responsible for observers on board program) are:
Precision scale Kern KB 360-3N, 360 g, Precision: 0.001 g;
Precision scale Kern KB 3600-2N, 3600 g, Precision: 0.01 g;
Scales with hook Kern HDB 5K5N, 5 kg;
Scales with hook Kern HDB 10K10N 10 kg;
LAB13_10447197- Stereo microscope Leica EZ 4;
Stereo microscope OLIMPUS SZ51;
Stereo microscope OLIMPUS SZ61;
Statistical program for fish parameters calculation:
The Catch Effort Data Analysis package (CEDA);
The Length Frequency Distribution Analysis (LFDA);
Yield Version 1.0;
FiSAT (FiSAT II);
PRIMER;

XLSTAT.



The accuracy of length measurement of the investigated specimens will be to the nearest 0.1 cm, and for weight - to the nearest 0.01 g. To ensure accurate measurements, the laboratory equipment should be kept in good condition, scales and microscopes should be regularly calibrated and checked yearly by a qualified technician.

The laboratory protocols for each sample include a full description of all measurements. IFR-Varna keeps the protocols from the observations in xls-files. All biological data, produced in a laboratory, should be completely documented and should be traceable back to its origin. The necessary documentation should contain a description of sampling equipment and procedures, reference to standard operating procedures (SOP) for sample handling and analytical procedures involved.


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

There are internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) in IFR, including all steps from planning of marine data collection and analysis - to sea expedition and final reporting. For example, all data, collected in the sea, are included in protocols and checked by two different persons for mistakes (scientist and expedition leader) and all samples are numbered and identified by given rules. If any corrections are needed, they are presented in separate protocols, controlled by two scientists. Scientific data are kept in the form of xls files, as specific technical reports are prepared every six months and on yearly basis.

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

Quality checks documentation: Indicate 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation

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

Y. The following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/ describe the quality checks:
Methodologies for biological sampling in the Bulgarian Black Sea area;
Guidelines on Data Quality Assurance and Data Quality Control;
GFCM-DCRF-manual;
Best practice guideline on scientific surveys and holistic methods in the Black Sea;
Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection;
Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection;
Manual of protocols on methods used for assessing fish stocks in the Black Sea by analytic methods.

Data storage

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

NA. The raw data and the relevant datasets are stored by the Institute of fish resources. Their database is not accessible through a website.

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

NA

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

Sample storage

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

The hard structures - otoliths, for age readings were stored for 2 years in the IFR.

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/:
Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection;
Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection
and
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when

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

Y. Information about the data accuracy is available in the following documents available at http://dcf-bulgaria.bg/data-collection-methodologies/
and
The precision of the sampling program is based on the requirements of the following reports:
"Sampling Calculation and Methodology for Fisheries Data" (WKSCMFD) (ICES 2004) - https://www.ices.dk/sites/pub/CM%20Doccuments/2004/ACFM/ACFM1204.pdf
Report of the Study Group on Practical Implementation of Discard Sampling Plans (SGPIDS) (ICES, 2011a) - https://www.ices.dk/community/Documents/PGCCDBS/SGPIDS%202011.pdf

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

Y. Internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) are applied in IFR, including all steps of marine data collection and analysis - from sea expedition to final reporting. For example, all data, collected in the sea, are included in protocols and checked by two different persons for mistakes (scientist and expedition leader) and all samples are numbered and identified by given rules. If any corrections are needed, they are presented in separate protocols, controlled by two scientists. The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

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

The documentation is available at: http://dcf-bulgaria.bg/data-collection-methodologies/

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

Internal rules for Data Quality Control (DQC) and Data Quality Assurance (DQA) are applied in IFR, including data labelling, checks on final protocols, reanalysis of samples on an annual basis, final reporting etc. The validation of the final datasets before being provided to the end user is performed by 2 different scientists in IFR.

AR comment: Indicate any deviations. Do not change the text already adopted in the work plan. There were no deviations.

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. Do not delete any text from the template.

One AR comment box per sampling scheme identifier (Sampling scheme identifier: Please indicate and update the table of content)

Survey Specifications
'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.* *'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.* *'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All supra regions'.*
Sector name(s): Fisheries
Sampling scheme: Census
Variables: Consumption of fixed capital, Days at sea, Energy consumption, Energy costs, Full-time equivalent (FTE), Gross debt, Gross value of landings, Income from leasing out quota or other fishing rights, Investments in tangible assets (net purchase of assets), Lease/rental payments for quota or other fishing rights, Mean age of vessels, Mean LOA of vessels, Number of fishing enterprises/units, Number of vessels, Operating subsidies, Other income, Other non-variable costs, Other variable costs, Paid labour, Personnel costs, Repair and maintenance costs, Subsidies on investments, Total hours worked per year (optional), Total value of assets, Total vessel power, Total vessel tonnage, Unpaid labour, Value of physical capital, Value of quota and other fishing rights, Value of unpaid labour, Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender, Unpaid labour by gender
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
1. Provide a short description of the population to which the sampling scheme applies, *e.g.* '*less active vessels using passive gears*'. The population to which the Census sampling scheme applies is all vessels which are operating under the Bulgarian flag. According to the Bulgarian legislation (Art. 18e from the Fisheries and Aquaculture Act), each owner of a fishing vessel, or his representative, is

required at the beginning of each year (before March 31) to submit economic and social information through a questionnaire for the previous year.
Survey design and strategy

List data sources, e.g. interviews, registers, log books, sales notes, VMS, financial accounts, etc.

Number of vessels, Total vessel power, Total vessel tonnage, Mean age of vessels, Mean LOA of vessels, Number of fishing enterprises/units, Days at sea, Gross value of landings and all other transversal variables listed in Table 6 of the EU MAP Delegated Decision annex, reported in different data calls are collected under the Control regulation, so they are obtained from the fleet register, logbook and sales notes, which are available in the information statistical system of EAFA - official administrative source.

Energy consumption, Energy costs, Full-time equivalent (FTE), Gross debt, Income from leasing out quota or other fishing rights, Investments in tangible assets (net purchase of assets), Lease/rental payments for quota or other fishing rights, Operating subsidies, Other income, Other non-variable costs, Other variable costs, Paid labour, Personnel costs, Repair and maintenance costs, Subsidies on investments, Total hours worked per year (optional), Total value of assets, Unpaid labour, Value of physical capital, Consumption of fixed capital, Value of quota and other fishing rights, Value of unpaid labour, Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender and Unpaid labour by gender are obtained from the annual questionnaires.

The variables Consumption of fixed capital and Value of physical capital are collected through the annual questionnaire as the other economic variables, instead of estimating them by applying the perpetual inventory method (PIM). The reason is that the values derived by the application of PIM were not realistic for the Bulgarian fleet and since the data collection is covering all the vessels and each owner is providing the most accurate data regarding the specific vessel, at national level was taken a decision of using the realistic values reported by the owners, instead of the estimated theoretical numbers.

Describe how the sample sizes were determined.

The sampling scheme is Census, so questionnaires are collected from all the vessels which are in the fleet register during the reference year (including the vessels which are not in the fleet register at 31.12 of the year, but has at least 1 day at sea).

Describe survey methods and distribution, e.g. questionnaire forms by post, by email, on website, by phone, access to other datasets, etc.

Every year the Executive Director of EAFA affirms the content and the type of questionnaire, which is prepared by the relevant data collection experts. The questionnaire is updated annually according to the relevant recommendations agreed at the regional level and/or to the end-users need.

The questionnaire is uploaded annually on the webpage of the agency, paper copies are available in the regional offices and each inspector from the agency also has a copy of the questionnaire.

The questionnaire can be completed manually by the owner of the enterprise, his representative /like accountant/ in the presence of an employee (someone from the administration) of the agency who is trained for this and is aware of the meaning of economic and social indicators or it can be sent through email or by post.

The filling of the questionnaire is completed after the questionnaire is entered in the electronic record-keeping system of the agency and a unique number is issued.

Describe the role of auxiliary information, if any, in the strategy, e.g. for validation, cross referencing, as a fall-

back data source, etc.

In the annual questionnaire for fleet the following information about the vessel – name of the vessel, name of the owner, CFR, GT, kW, days at sea by fishing gear, are also collected, even though the data is available in the logbook because it is used for cross-checking purposes.

Estimation design

1. Describe method of calculating population estimate from sample. – No estimation procedures are used, because the collection of questionnaires is from all vessels.
2. Describe method of calculating derived data: e.g. imputed values. - No methods for calculating derived data are used, because all variables in the questionnaire are mandatory – no empty answers are allowed.
3. Describe treatment of nonresponse. - If for some reason after 31st of March some of the owners of the vessels had not reported data for the previous year, an employee of the agency contacts the owner and reminds him of this obligation and if necessary – administrative sanction can be imposed.

Error checks

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

Potential errors are missing or unrealistic values, which are covered by the first quality checks of the questionnaire which are made by the employee of EAFA who receives the questionnaire – this initial check is focused mainly on the amount of data filled in and the existence of unrealistic numbers. The second check is focused on the same possible mistakes and it is done by the person who submits the data from the questionnaire in the database of EAFA. If at this stage of the processing of the questionnaire are detect any inconsistencies or value that is not logical, based on parameters of the vessel, number of employees, fishing techniques, days at sea or comparison between landings and income, an employee of the agency contacts the owner of the vessel and if he is not able to provide a logical explanation, he is obliged to come and edit the value. Double counting, data duplication and respondent error are not likely to happen, because each vessel is filling one questionnaire per year. The upload error is also not possible because the scanned questionnaires are uploaded in the system, which is managing the documents in the agency and they are upload to the vessels files. After the processing of questionnaires by an expert, all the data is checked by another independent expert for typos.

Data storage and documentation

1. Describe how the data is stored. – Data is stored in the EAFA's database.
2. Provide link to webpage where additional methodological documentation can be found, if any.

The documentation is available in the national DCF webpage under section Methodologies used for transversal and socio-economic variables data collection on the following link: http://dcf-bulgaria.bg/data-collection-methodologies/

Revision

1. Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

Every year the Executive Director of EAFA affirms the content and the type of questionnaire, which is prepared by the relevant data collection experts. Change in the methodologies is not expected, because the questionnaires are mandatory according to the national legislation.

Confidentiality

1. Are procedures for confidential data handling in place and documented? – By Order, No RD-212/27.05.2020 of the executive director of EAFA an information security management system was approved. The security management system consists of 21 documents, which are not published online due to security reasons, but all the employees in the agency are obliged to follow them. Within the documentation, protocols to enforce confidentiality are available.
2. Are protocols to enforce confidentiality between DCF partners in place and documented? – NA. The Agency is the only institution that is collecting the data for DCF and we don't have partners now. If in future we have some contracts with any partners for collecting data we will revise the table.
3. Are protocols to enforce confidentiality with external users in place and documented? – Yes, the protocols to enforce confidentiality with external users are in place and they are documented in the security management system described above.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. – There are no issues with the publication of data due to confidentiality reasons. The economic and social data for segments with less than 5 vessels are reported with the most similar segment.

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

One AR comment box per sampling scheme identifier (Sampling scheme identifier: Please indicate and update the table of content)

Survey Specifications
'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.* *'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.* *'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All supra regions'.*
Sector name(s): Aquaculture
Sampling scheme: Census
Variables: Consumption of fixed capital, Energy costs, Financial expenditures, Financial income, Fish feed used, Full-time equivalent (FTE), Gross debt, Gross sales per species, Investments in tangible assets (net purchase of assets), Livestock used, Number of enterprises by size category, Number of hours worked by employees and unpaid workers (optional), Operating subsidies, Other income, Other operating costs, Paid labour, Personnel costs, Raw material: feed costs, Raw material: livestock costs, Repair and maintenance costs, Subsidies on investments, Total value of assets, Unpaid labour, Value of unpaid labour, Weight of sales per species, Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender, Unpaid labour by gender.
Supra region(s): Mediterranean Sea and Black Sea
Survey planning
1. Provide a short description of the population to which the sampling scheme applies, *e.g.* '*less active vessels using passive gears*'. The population to which the Census sampling scheme applies is all registered enterprises for aquaculture in Bulgaria. According to the Bulgarian legislation (Art. 27 from the Fisheries and Aquaculture Act), each owner of an aquaculture enterprise, or his representative, is required at the beginning of each year (before January 31) to submit economic and social information through a questionnaire for the previous year.
Survey design and strategy

List data sources, e.g. interviews, registers, log books, sales notes, VMS, financial accounts, etc.

Number of enterprises by size category is obtained from the official administrative source - EAFA' s register. Gross sales per species and Weight of sales per species are obtained from the sales notes.

Consumption of fixed capital, Energy costs, Financial expenditures, Financial income, Fish feed used, Full-time equivalent (FTE), Gross debt, Investments in tangible assets (net purchase of assets), Livestock used, Number of hours worked by employees and unpaid workers (optional), Operating subsidies, Other income, Other operating costs, Paid labour, Personnel costs, Raw material: feed costs, Raw material: livestock costs, Repair and maintenance costs, Subsidies on investments, Total value of assets, Unpaid labour, Value of unpaid labour, Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender and Unpaid labour by gender are obtained from the annual questionnaires.

Describe how the sample sizes were determined.

The sampling scheme is Census, so questionnaires are collected from all aquaculture farm which are registered in Bulgaria.

Describe survey methods and distribution, e.g. questionnaire forms by post, by email, on website, by phone, access to other datasets, etc.

Every year the Executive Director of EAFA affirms the content and the type of questionnaire, which is prepared by the relevant data collection experts. The questionnaire is updated annually according to the relevant recommendations agreed at the regional level and/or to the end-users need.

The questionnaire is uploaded annually on the webpage of the agency, paper copies are available in the regional offices and each inspector from the agency also has a copy of the questionnaire.

The questionnaire can be completed manually by the owner of the enterprise, his representative /like accountant/ in the presence of an employee (someone from the administration) of the agency who is trained for this and is aware of the meaning of economic and social indicators or it can be sent through email or by post.

The filling of the questionnaire is completed after the questionnaire is entered in the electronic record-keeping system of the agency and a unique number is issued.

Describe the role of auxiliary information, if any, in the strategy, e.g. for validation, cross referencing, as a fall-back data source, etc.

In the annual questionnaire for aquaculture the following information about the enterprise – name of the enterprise, name of the owner, unique number of the enterprise and sales volume, are also collected, even though the data is available in the EAFA's database because it is used for cross-checking purposes.

Estimation design

1. Describe method of calculating population estimate from sample. – No estimation procedures are used, because the collection of questionnaires is from all aquaculture enterprises.

2. Describe method of calculating derived data: e.g. imputed values. - No methods for calculating derived data are used, because all variables in the questionnaire are mandatory – no

empty answers are allowed.

3. Describe treatment of nonresponse. - If for some reason after 31st of January some of the owners of the farms had not reported data for the previous year, an employee of the agency contacts the owner by phone or EAFA's inspector is visiting the enterprise to remind the owner of this obligation and if necessary – administrative sanction can be imposed.

Error checks

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

Potential errors are missing or unrealistic values, which are covered by the first quality checks of the questionnaire which are made by the employee of EAFA who receives the questionnaire – this initial check is focused mainly on the amount of data filled in and existence of unrealistic numbers. The second check is focused on the same possible mistakes and it is done by the person who submits the data from the questionnaire in the database. If at this stage of the processing of the questionnaire are detected any inconsistencies or value that is not logical, based on parameters of the enterprise or its technology production documentation (which is available for each enterprise), number of employees or comparison between sales volume and income, an employee of the agency contacts the owner of the aquaculture farm and if he is not able to provide a logical explanation, he is obliged to come and edit the value. Double counting, data duplication and respondent error are not likely to happen, because for each enterprise one questionnaire per year is filled. The upload error is also not possible because the scanned questionnaires are uploaded in the system, which is managing the documents in the agency and they are upload to the aquaculture farms' files. After the processing of questionnaires by an expert, all the data is checked by another independent expert for typos.

Data storage and documentation

1. Describe how the data is stored. – Data is stored in the EAFA's database.
2. Provide link to webpage where additional methodological documentation can be found, if any.

The documentation is available in the national DCF webpage under section Methodologies used for transversal and socio-economic variables data collection on the following link: http://dcf-bulgaria.bg/data-collection-methodologies/

Revision

1. Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

Every year the Executive Director of EAFA affirms the content and the type of questionnaire, which is prepared by the relevant data collection experts. Change in the methodologies is not expected, because the questionnaires are mandatory according to the national legislation.

Confidentiality

1. Are procedures for confidential data handling in place and documented? – By Order No RD-

212/27.05.2020 of the executive director of EAFA, an information security management system was approved. The security management system consists of 21 documents, which are not published online due to security reasons, but all the employees in the agency are obliged to follow them. Within the documentation, protocols to enforce confidentiality are available.

2. Are protocols to enforce confidentiality between DCF partners in place and documented? – NA. The Agency is the only institution that is collecting the data for DCF and we don't have partners now. If in future we have some contracts with any partners for collecting data we will revise the table.
3. Are protocols to enforce confidentiality with external users in place and documented? – Yes, the protocols to enforce confidentiality with external users are in place and they are documented in the security management system described above.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. – There are no issues with the publication of data due to confidentiality reasons.

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

One AR comment box per sampling scheme identifier (Sampling scheme identifier: Please indicate and update the table of content)

Survey Specifications

'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.
'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.
'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.
'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All supra regions'.

Sector name(s): Processing

Sampling scheme: Census

Variables: Consumption of fixed capital, Energy costs, Financial expenditures, Financial income, Full-time equivalent (FTE), Gross debt, Gross investments, Number of enterprises, Number of enterprises by size category, Number of hours worked by employees and unpaid workers (optional), Number of persons employed, Operating subsidies, Other income, Other operating costs, Payment for external agency workers, Personnel costs, Purchase of fish and other raw material for production, Subsidies on investments, Total value of assets, Turnover, Unpaid labour, Value of raw material by country of origin (domestic, other EU or non-EU), Value of raw material by production environment (capture based fishery and aquaculture sector), Value of raw material by species, Value of raw material by type of processed

material (fresh, frozen and semi processed materials), Value of unpaid labour, Weight of raw material by country of origin (domestic, other EU or non-EU), Weight of raw material by production environment (capture based fishery and aquaculture sector), Weight of raw material by species, Weight of raw material by type of processed material (fresh, frozen and semi processed materials), Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender, Unpaid labour by gender.

Supra region(s): Mediterranean Sea and Black Sea

Survey planning

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

Registration and control of processing plants are carried out by the Bulgarian Food Safety Agency (BFSA). At the beginning of each year, an expert from EAFA, which is responsible for the data collection from fish processing enterprises is downloading the list of active processing plants from the official online registers available on the webpage of the BFSA. In regards to the Data Collection Framework, the Bulgarian legislation was adapted in order to collect socio-economic variables from EU MAP, and in 2016 the Fisheries and aquaculture Act was amended. As a responsible institution for data collection, EAFA was provided with the rights to collect data for the fish processing sector. The socio-economic data is collected annually through questionnaires.

The population to which the Census sampling scheme applies is all registered processing enterprises in Bulgaria. According to the Bulgarian legislation (Art. 27a from the Fisheries and Aquaculture Act), each owner of a processing enterprise, or his representative, is required at the beginning of each year (before January 31) to submit economic and social information for the previous year.

Survey design and strategy

List data sources, e.g. interviews, registers, log books, sales notes, VMS, financial accounts, etc.

Number of enterprises is obtained from the official administrative source – BFSA's register. Consumption of fixed capital, Energy costs, Financial expenditures, Financial income, Full-time equivalent (FTE), Gross debt, Gross investments, Number of enterprises by size category, Number of hours worked by employees and unpaid workers (optional), Number of persons employed, Operating subsidies, Other income, Other operating costs, Payment for external agency workers, Personnel costs, Purchase of fish and other raw material for production, Subsidies on investments, Total value of assets, Turnover, Unpaid labour, Value of raw material by country of origin (domestic, other EU or non-EU), Value of raw material by production environment (capture based fishery and aquaculture sector), Value of raw material by species, Value of raw material by type of processed material (fresh, frozen and semi processed materials), Value of unpaid labour, Weight of raw material by country of origin (domestic, other EU or non-EU), Weight of raw material by production environment (capture based fishery and aquaculture sector), Weight of raw material by species, Weight of raw material by type of processed material (fresh, frozen and semi processed materials), Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender and Unpaid labour by gender are obtained from the annual questionnaires.

Describe how the sample sizes were determined.

The sampling scheme is Census, so questionnaires are collected from all fish processing enterprises which are registered in Bulgaria.

Describe survey methods and distribution, e.g. questionnaire forms by post, by email, on website, by phone, access to other datasets, etc.

Every year the Executive Director of EAFA affirms the content and the type of questionnaire, which is prepared by the relevant data collection experts. The questionnaire is updated annually according to the relevant recommendations agreed at the regional level and/or to the end-users need. The questionnaire is uploaded annually on the webpage of the agency, paper copies are available in the regional offices and each inspector from the agency also has a copy of the questionnaire.

The questionnaire can be completed manually by the owner of the enterprise, his representative /like accountant/ in the presence of an employee (someone from the administration) of the agency who is trained for this and is aware of the meaning of economic and social indicators or it can be sent through email or by post.

The filling of the questionnaire is completed after the questionnaire is entered in the electronic record-keeping system of the agency and a unique number is issued.

Describe the role of auxiliary information, if any, in the strategy, e.g. for validation, cross referencing, as a fall-back data source, etc.

In the annual questionnaire for processing enterprises, no auxiliary information is collected.

Estimation design

1. Describe method of calculating population estimate from sample. – No estimation procedures are used, because the collection of questionnaires is from all fish processing enterprises.

2. Describe method of calculating derived data: e.g. imputed values. – No methods for calculating derived data are used, because all variables in the questionnaire are mandatory – no empty answers are allowed.

3. Describe treatment of nonresponse. - If for some reason after 31st of January some of the owners of the enterprises had not reported data for the previous year, an employee of the agency contacts the owner by phone or EAFA's inspector is visiting the enterprise to remind the owner of this obligation and if necessary – administrative sanction can be imposed.

Error checks

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

Potential errors are missing or unrealistic values, which are covered by the first quality checks of the questionnaire which are made by the employee of EAFA who receives the questionnaire – this initial check is focused mainly on the amount of data filled in and the existence of unrealistic numbers. The second check is focused on the same possible mistakes and it is done by the person who submits the data from the questionnaire in the database. If at this stage of the processing of the questionnaire are detected any inconsistencies or value that is not logical, based on parameters of the enterprise or its production, number of employees or comparison between sales volume and income, an employee of the agency contacts the owner of the processing enterprise and if he is not able to provide a logical explanation, he is obliged to come and edit the value. Double counting, data duplication and respondent error are not likely to happen, because for each enterprise one questionnaire per year is filled. The upload error is also not possible because the scanned questionnaires are uploaded in the system, which is managing the documents in the agency. After the processing of questionnaires by an expert, all the data is checked by another independent expert for typos.

Data storage and documentation

1. Describe how the data is stored. – Data is stored in the EAFA's database.
2. Provide link to webpage where additional methodological documentation can be found, if any.

The documentation is available in the national DCF webpage under section Methodologies used for transversal and socio-economic variables data collection on the following link: http://dcf-bulgaria.bg/data-collection-methodologies/

Revision

1. Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

Every year the Executive Director of EAFA affirms the content and the type of questionnaire, which is prepared by the relevant data collection experts. Change in the methodologies is not expected, because the questionnaires are mandatory according to the national legislation.

Confidentiality

1. Are procedures for confidential data handling in place and documented? – By Order No RD-212/27.05.2020 of the executive director of EAFA, an information security management system was approved. The security management system consists of 21 documents, which are not published online due to security reasons, but all the employees in the agency are obliged to follow them. Within the documentation, protocols to enforce confidentiality are available.
2. Are protocols to enforce confidentiality between DCF partners in place and documented? – NA. The Agency is the only institution that is collecting the data for DCF and we don't have partners now. If in future we have some contracts with any partners for collecting data we will revise the table.
3. Are protocols to enforce confidentiality with external users in place and documented? – Yes, the protocols to enforce confidentiality with external users are in place and they are documented in the security management system described above.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. – There are no issues with publication of data due to confidentiality reasons.

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

ANNEX 2: Minutes from the national coordination meeting

Republic of Bulgaria
Ministry of agriculture and food
Executive agency for fisheries and aquaculture

MINUTES FROM THE BULGARIAN COORDINATION MEETING 2023

TYPE OF THE MEETING: National Coordination Meeting on the implementation of the National Data Collection Program – Bulgaria

DATE: 23rd of November 2023

PLACE: Executive agency for fisheries and aquaculture – 1 Aleksander Batenberg str., Burgas, Bulgaria

DISCUSSION TOPICS:

1. **Results from the research surveys for assessment of biomass and abundance of the fish stocks of demersal and pelagic species in the Black Sea in 2022;**
2. **Discussing the ongoing research surveys for the assessment of the biomass of the demersal and pelagic fish stocks in 2023;**
3. **Results from the scientific study for estimation of the catch, discards, and landings, and collection of biological data for all species of fish and other marine organisms, through observers on board of fishing vessels from the fleet of the Republic of Bulgaria, which carry out fishing activities in the Black Sea in 2022 and ongoing study in 2023;**
4. **The execution of the Work plan for 2022-2024.**

PARTICIPANTS:

FROM EXECUTIVE AGENCY FOR FISHERIES AND AQUACULTURE:

- Simona Nicheva – National correspondent for DCF and expert in Directorate "Management of Fisheries and Conservation of Fish Resources, EAFA;
- Kolyo Zhelev – Expert in Directorate "Management of Fisheries and Conservation of Fish Resources, EAFA.

1

FROM INSTITUTE OF FISH RESOURCES, VARNA:

- Assoc. Prof. Elitsa Petrova, PhD – Director of Institute of Fish Resources, Varna;
- Feriha Tserkova, PhD – Assistant in the Institute of Fish Resources, Varna.

FROM INSTITUTE OF OCEANOLOGY - BULGARIAN ACADEMY OF SCIENCE, VARNA:

- Assoc. Prof. Violin Raykov, PhD – Scientist in the Institute of Oceanology;
- Assoc. Prof. Mariya Yankova, PhD – Scientist in the Institute of Oceanology.

DISCUSSION:

The meeting was opened by the hosts, and the participants were welcomed.

Assoc. Prof. Violin Raykov presented the results from the pelagic trawl surveys in 2022. The total number of species found during the survey in spring was 20, while in autumn it was 19. From the total species found during the survey in 2022, 14 were fish, 1 crustacean, 2 molluscs, and 3 macrozooplankton species. The total biomass of the sprat during the spring was 43 015 tonnes. During the autumn of 2022, sprat was very poorly represented (only in a few control trawls), with 59 specimens, which did not allow the calculation of asymptotic length and growth parameters. During the study in July 2022, the smallest size class identified was 6 cm and the largest was 12 cm, with the predominant size classes in the catch composition being 8.5–9 cm. Females of the sprat were represented with a percentage of 49%, while the males were 48%. The juveniles were represented by a very small percentage (3%). In July 2022, the food spectrum of sprat encompassed 19 species/groups of zooplankton. The recommended value for sprat catch remains at the level of the last two years, namely 8200 t.

Mrs. Feriha Tserkova presented the results from the bottom trawl surveys performed in 2022. In accordance with the collected data and obtained results from the trawl surveys in July and December 2022, the following conclusions and recommendations can be made: The turbot biomass in the Bulgarian Black Sea waters was assessed 1 775.96 tonnes in July and 1 696.67 tonnes in December. The turbot abundance in the surveyed area was estimated at 1 072 483 individuals in July and 814 652 individuals in December. The recommended MSY (maximum sustainable yield) for Bulgaria should not exceed from 113 t., and it is assumed that the total allowable catch (TAC) could comprise 65 tonnes as a relatively acceptable quantity.

Assoc. Prof. Elitsa Petrova presented results from the scientific study carried out by observers on board. In 2022, scientific observations of fishing vessels of the Bulgarian fleet covered 100 fishing days – 30 days of vessels with gill nets, 30 days of pelagic trawl vessels, 20 days of beam trawl vessels, and 20 days of polyvalent vessels. The target catch of the observed gill nets was turbot (*Scophthalmus maximus*), and the bycatch species composition

included mainly common stingray (*Dasyatis pastinaca*), thornback ray (*Raja clavata*), black mussel (*Mytilus galloprovincialis*), piked dogfish (*Squalus acanthias*), and Rapa whelk (*R. venosa*). The bycatch was dominated by black mussels (55.54%), thornback rays (25.81%) and spiny dogfish (3.34%). The average daily percentage share of bycatch for both fishing segments is estimated at 29.6% ± 3.47 SE of the total catch. The target catch was dominated by turbot specimens with small individual sizes, 45.1 - 50 cm, accounting for 54.09% of the catch weight. In 2022, the study on pelagic trawl fishery was focused on catches of sprat (*Sprattus sprattus*) and the fleet segment of vessels with a length over 24 m. A total of 27 species of marine organisms were identified in the bycatch of sprat fisheries, and on average, approximately four different species were found in the bycatch per day. The moon jellyfish, *Aurelia aurita*, was the dominant species, accounting for 96% of the average weight of the total daily bycatch. If this type of zooplankton were excluded from the calculations, then among the fish and crustaceans caught, the dominant species by weight were shark (29.3%), whiting (26.66%), turbot (11.43%), anchovy (5.69%), Pontic shad (5.49%), and round goby (5.17%). The bycatch rate of fish and crustaceans in this fishery was low (0.12% TC ± 0.02 SE), which corresponds to the results for 2018–2021. In 2022, a beam trawl survey of Rapa whelk covered a fishing segment, TBB VL1824. The catches of R. venosa were between 702 - 2094 kg/day, and the quantities of bycatch varied between 2.32 - 17.77 kg/day; the total catch was 1276.36 kg/day ± 84.50 SE, and the average percentage share of bycatch was 0.68% ± 0.12 SE of this catch The species composition of bycatch in Rapa whelko fishing was diverse and included 37 species of fish, arthropods, and mollusks, with a maximum of 19 different species of marine organisms found in beam trawls per day. Turbot is most often caught in bycatch, in 100% of daily bycatch, as well as stargazer, *Uranoscopus scaber*, which is found in 90% of daily bycatch. The dominant species by weight in the bycatch were turbot (61%), followed by stargazer (13%), flounder (8%), swimming crab (5%), and thornback ray (4%). The study with polyvalent vessels covered two fleet segments - fishing vessels with lengths of 12-18 m and 18 - 24 m and takes place in the autumn period of 2022. A mixed catch of mullet, horse mackerel, and bluefish was recorded, and the average daily catch of the target species was 670.21 kg/day ± 106.00 SE, the average weight of the bycatch was 37.50 kg/day ± 8.14 SE, with a total catch weight - 707.71 kg/day ± 105.52 SE. A total of 49 species of marine organisms, mainly fish and crustaceans, were identified as bycatch, with an average of 10 different species registered per day. The most frequent daily catches included swimming crabs (80% of the daily catch), stargazers (70%), flounders (65%), round gobies (60%), greater weever (50%), and black mussels (50 %). In the stargazer bycatch, average lengths of 14.13 cm and weights of 54.21 g were recorded. The dominant bycatch species were caspian shads (29.9%), turbots (12.6%), common stingrays (12.6%), stargazers (7.8%) and thornback ray (4.7%). The species of common stingray (T = 1.7 ind/day, and thornback ray (T = 1.2/day) had the highest bycatch coefficients.

The ongoing research surveys for the assessment of the biomass of the demersal and pelagic fish stocks in 2023 were discussed. The leaders of the surveys expressed their opinion about well-prepared expeditions and obtained comprehensive results that could be used in the stock assessment analyses. They also raised the financial issue and invited administration for urgent measures in order to transfer advance payments for 2023, because they already had costs. The payment process was well described by administration, as well as the complexity of the requirements introduced by the Ministry which is the final authority that should transfer the amounts.

The implementation of the National Work Plan during 2024 was also discussed. Representatives of the research institutes noted that the scientific research surveys are under implementation and the execution of the 2024 activities will be also well prepared and executed. Moreover, the surveys for 2024 are under the same protocol and requirements, and no issues are expected.

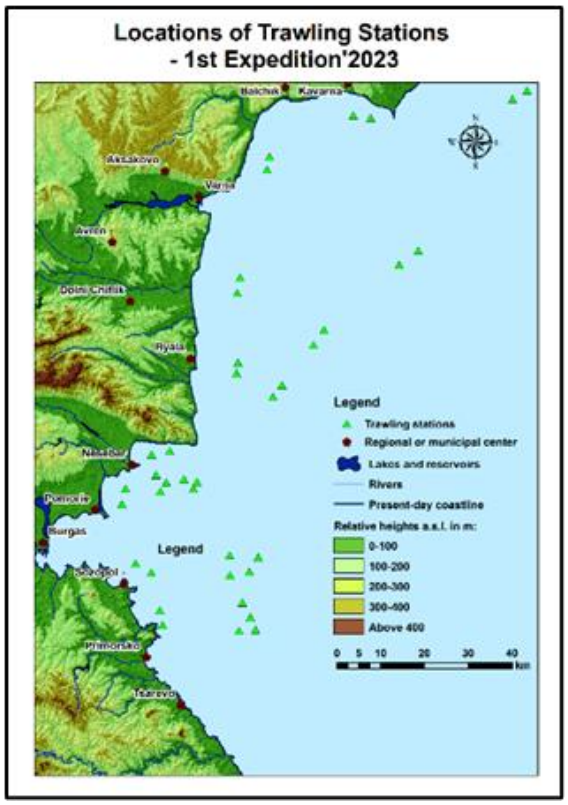
It was mentioned that in 2024 the Working Group for the Black Sea under GFCM is planned and all activities regarding the reporting of data and assessment of the stocks should be well coordinated between all parties involved in the process.

The representatives of EAFA and research institutes have expressed readiness to work on future reports related to the research surveys together.

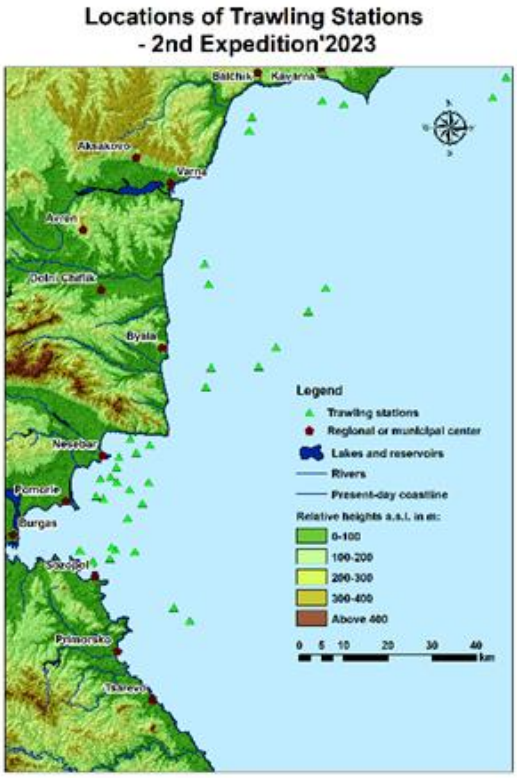
Representatives of EAFA	Representatives of IFR	Representatives of IO-BAS
.....	.....	.....
.....	.....	.....

Annex 3. MAPS OF THE ACHIEVED RESEARCH SURVEY STATIONS FROM THE PELAGIC TRAWL SURVEY AND THE BOTTOM TRAWL SURVEY.

Maps 3.1. - Maps from the pelagic trawl survey, 2023

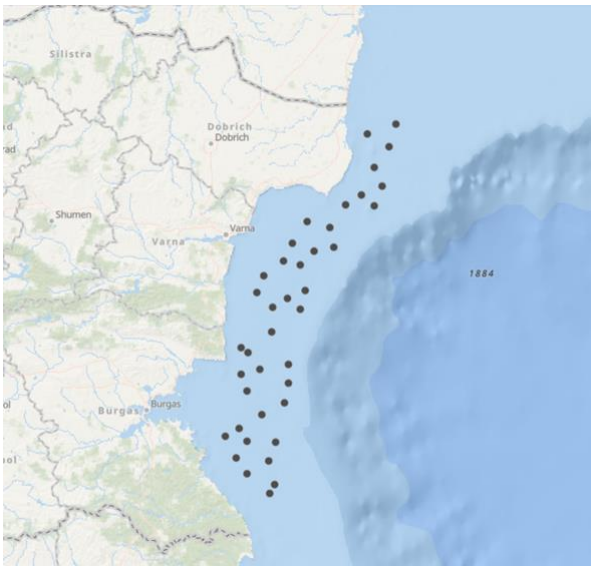


Map of the PTSBS trawling stations, spring 2023

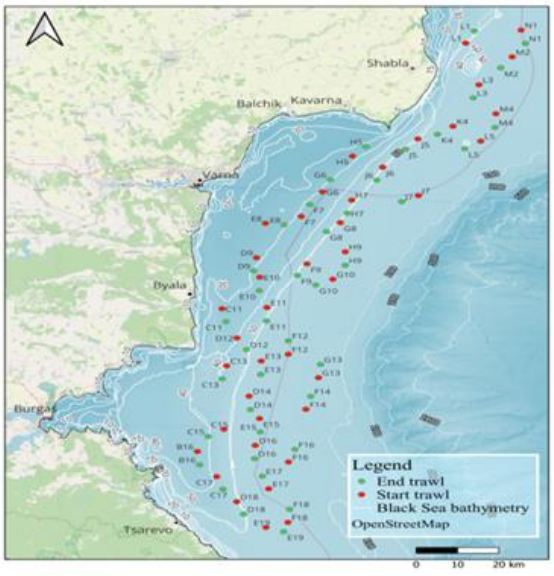


Map of the PTSBS trawling stations, autumn 2023

Maps 3.2. - Maps from the bottom trawl survey, 2023



Map of the BTSBS trawling stations, spring 2022



Map of the BTSBS trawling stations, autumn 2022