



MINISTRY OF AGRICULTURE



INSTITUTE OF OCEANOGRAPHY AND
FISHERIES

Croatia - Annual Report on data collection in the fisheries and aquaculture sectors

2022

Version 3

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

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

Commission Delegated Decision (EU) 2021/1167 of 16 July 2021
establishing the multiannual Union programme for the collection and management of
biological, environmental, technical and socioeconomic data in the fisheries and aquaculture
sectors from 2022

Commission Implementing Decision (EU) 2021/1168 of 16 July 2021
establishing the list of mandatory research surveys at sea and thresholds as part of the
multiannual Union programme for the collection and management of data in the fisheries and
aquaculture sectors from 2022

Commission Implementing Decision (EU) 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

Zagreb, 31 May 2023



EUROPEAN UNION



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SECTION 1: GENERAL INFORMATION

Data collection framework at national level

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

Data collection in fisheries in the Republic of Croatia in accordance with the provisions of the Common Fisheries Policy of the European Union is conducted by two main institutions, Ministry of Agriculture - Directorate of Fisheries and the Institute of Oceanography and Fisheries.

Ministry of Agriculture - Directorate of Fisheries (MA-DoF):

The national authority responsible for implementing the National Data Collection Programme is the Ministry of Agriculture - Directorate of Fisheries (MA-DoF).

In Croatia all administrative duties involved in the fishing sector, including data collection, monitoring, control and surveillance are undertaken by the DoF. Apart from the central office in Zagreb, DoF has seven field offices within each coastal County (Pula, Rijeka, Senj, Zadar, Šibenik, Split, Dubrovnik). The field offices are in charge of technical and administrative issues with regards to issuing, registering and administering the licences (commercial fisheries), approvals (sports and recreational fisheries) and authorisations, entering the data from logbooks and catch reports into the central database, keeping registers of licences and fleet registers.

MA-DoF coordinates the implementation of data collection at the national level and is responsible for the implementation of the following sections of the WP:

- Section 1b. Other data collection activities
- Section 2.3. Diadromous species data collection in freshwater
- Section 3. Fishing Activity Data
- Section 5. Economic and social data in fisheries
- Section 6. Economic and social data in aquaculture
- Section 7. Economic and social data in fish processing

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Institute of Oceanography and Fisheries (IOF):

The Institute of Oceanography and Fisheries in Split (IOF) implements monitoring and data collection programmes in the field of fisheries biology. IOF is a state-owned institution under the Ministry of Science and Education, covering a wide range of marine-related fields of research including fisheries.

IOF was founded in 1930 as the first national scientific and research institution dealing with research of the sea. Scientific activity of the Institute is extremely multidisciplinary, since it covers almost all fields of research. IOF carries out a very complex research in the fields of biological, chemical and physical oceanography, sedimentology, and fisheries biology and aquaculture.

The fundamental scientific research of IOF is mostly conducted through projects of continuing research activities funded by the Croatian Ministry of Science and Education. Pursuant to the Marine Fisheries Act (OG 62/17, 130/17 – Act aquaculture and 14/19) IOF is responsible for the collection of biological data according to the national plan for data collection in fisheries in the Republic of Croatia, as well as in charge of monitoring required for the assessment of the effects of all or some forms of fisheries on the marine ecosystem.

IOF is responsible for the implementation of the following sections of the WP:

- Section 1a: Test studies
- Section 1b: Other data collection activities
- Section 2: Biological Data
- Section 4: Impact of fisheries on marine biological resources

PhD Nedo Vrgoč is the leader of project activities and contact person for the overall implementation of the biological component of the WP in 2022-2024. PhD Igor Isajlović is assigned as technical coordinator.

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National data collection website:

A web page on Data Collection Programme for Croatia has been developed under the premises of MA-DoF: <https://podaci.ribarstvo.hr/>

Participation in Regional Coordination Groups:

Croatia is a member of the following regional coordination groups:

- RCG Med&BS - Regional Coordination Group for the Mediterranean and Black Sea;
- RCG LP - Regional Coordination Group on Large Pelagics; and
- RCG ECON - Regional Coordination Group for Economic Issues.

In addition, Croatia participates in the Intersessional subgroup on Diadromous Species, and other ISSGs when relevant.

Table 1. National data collection organization

SECTIONS	RESPONSIBLE INSTITUTES
Section 1: General information	
Text Box 1a: Test studies	MA-DoF & IOF
Text Box 1b: Other data collection activities	MA-DoF & IOF
Section 2: Biological Data	
Text Box 2.3: Diadromous species data collection in freshwater	MA-DoF

Text Box 2.4: Recreational Fisheries	MA-DoF & IOF
Text Box 2.5: Sampling plan description for biological data	IOF
Text Box 2.6: Research surveys at sea	IOF
Section 3: Fishing Activity Data	
Text Box 3.1: Fishing activity variables data collection strategy	MA-DoF
Text Box 3.2: Fishing activity variables data collection strategy (for inland eel commercial fisheries)	MA-DoF
Section 4: Impact of fisheries on marine biological resources	
Text Box 4.2: Incidental catches of sensitive species	IOF
Text Box 4.3: Fisheries impact on marine habitats	IOF
Section 5: Economic and social data in fisheries	
Text Box 5.2: Economic and social variables for fisheries data collection	MA-DoF
Section 6: Economic and social data in aquaculture	
Text Box 6.1: Economic and social variables for aquaculture data collection	MA-DoF
Section 7: Economic and social data in fish processing	
Text Box 7.1: Economic and social variables for fish processing data collection	MA-DoF
ANNEX 1.1 - Quality report for biological data sampling scheme	IOF
ANNEX 1.2 - Quality report for socioeconomic data sampling scheme	MA-DoF

Text Box 1a: Test studies description

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

Name of the study: Test study on the exploitation of red coral

Exploitation of red coral (*Corallium rubrum*) in Croatia is regulated according to GFCM Multiannual Management Plan for Red Coral in the Mediterranean Sea (Rec. GFCM/43/2019/4) and Council Regulation (EU) 2021/90 which set the maximum number of fishing authorisations for red coral harvesting (28), and annual harvest limits for red coral (1,226 tons). National legislation further limits number of fishing authorizations to 10 fishing vessels, and reduces the national catch limit to 850 kg in 2021 and 425 kg in 2022. Conservation status of red coral is determined as endangered according to the IUCN "red list", and in Croatia is assessed as critically endangered (CR) (Ordinance on strictly protected species, OG 144/2013 and 73/2016). Taking into account the conservation status of red coral in Croatia, national catch limit was further reduced to 850 kg for 2021 and 425 kg for 2022. Catch limits are determined per authorized vessel. Specific authorizations for red coral issued in 2021 to 10 vessels are valid from 1 April 2021 until 30 June 2022 (Decision on authorization of vessels for harvesting red coral valid until 30 June 2022, OG 32/2021). Furthermore, Ordinance on commercial fishing at sea by diving (OG 30/2021) defined closures for red coral, in accordance with available biological information and ongoing national study on biology and distribution of red coral, and introduced conditions for harvesting (areas, depth, gears etc.). Several mechanisms are prescribed to facilitate monitoring and inspection, including electronic real time catch reporting, prior notification on arrival to port, limited number of landing places (11 fishing ports). Prior to the described revision of the legal framework for red coral, there was a national set of provisions in force in 2020 setting the maximum annual catch per license to 200kg. According to the Annual report on balance between fishing capacity and fishing opportunities for 2020, additional management mechanisms are foreseen to further reduce the impact of fisheries on red coral.

1. Aim of the test study

Red coral exploitation in Croatia has a long tradition, however scientific monitoring of these activities has not

been adequately organized so far. The aim of this test study is to collect basic information on the exploitation of red coral in Croatia, develop data collection methodology and to make a proposal for future permanent monitoring in case this fishery will continue.

2. Duration of the test study

01/01/2022 – 31/12/2022

3. Methodology and expected outcomes of the test study

Study will be performed by IOF with the support of MA-DoF. Data collection for the implementation of this test study will be conducted in two ways: (1) through questionnaires (interview) and (2) biological sampling on shore. Questionnaire will cover all fishermen engaged in this activity, and data on fishing effort, exploitation dynamics, coral gathering methodology, long-term trends, socio-economic data etc. Biological data (amount and biomass of gathered corals, diameter, length, etc.) will be collected on commercial catches of fishermen. In this way, the data necessary for a detailed description of this type of fishing and the realized catch will be collected, and based on that, a proposal for future monitoring will be provided.

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

Funding of this activity was planned from the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) given that Croatia used up all allocated EMFF funds for data collection for the period 2014-2020.

In the course of 2022, informal consultation with the Commission was initiated on the adoption of the Partnership Agreement 2021-2027 with Croatia, and during this period the documentation for the initiation of the public procurement procedure was also prepared.

Given there were some delays in the consultation process for the Partnership Agreement 2021-2027 with Croatia, and consequently the Croatian EMFAF Programme, the Programme was informally agreed, including DCF financing, and officially adopted in the end of November 2022.

Following internal MA-DoF procedures, the pilot study underwent a public procurement process in early 2023, after which the contract was signed with the service provider (IOF) in late May 2023. Due to these circumstances, all planned activities have been adjusted as described below. Croatia will amend the Work Plan for 2024 in line with these changes.

Expected duration of the pilot study was adapted to 14 months, 12 month period for the implementation of activities and an extra two months for reporting of results, which are expected in late July 2024.

Activities are planned as follows:

Research and questionnaire design: The research team will design research methodology and questionnaire within 60 days after the signing of the contract.

Data collection (questionnaire), biological sampling, and analysis: The data collection phase, including the administration of the questionnaire and biological sampling, will be done during the 10 months after the signing of the contract.

Data analysis: The comprehensive analysis of all collected data will be conducted within 12 months after the signing of the contract.

Reporting: The final stage of the study will be the preparation of the study report. The research team will compile and summarize findings, conclusions, and recommendations within 14 months after the signing of the contract.

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

Not applicable.

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

Not applicable.

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.

Name of the study: Study on the impact of fishing tourism on marine ecosystem and fishery resources**1. Aim of the data collection activity**

In accordance with the Marine Fisheries Act (OG 62/17, 130/17 – Act aquaculture and 14/19), commercial fishermen can also perform a special category of fishing: fishing for tourist purposes. The goal of these fishing activities is primarily touristic: demonstration of fishing, introducing tourists to fishing techniques and marine organisms found in the catch. At the same time during touristic fishery, leisure and entertainment activities take place on and around the boat, as well as tasting and consumption of food originating from the sea. Currently in Croatia several commercial fishermen are engaged in this activity and there is almost no more detailed information about what this type of fishing means in terms of fishery-biological and socio-economic terms, therefore the aim of this study is to describe it.

2. Duration of the data collection activity

Bearing in mind that fishing for tourism purposes is a seasonal activity, the duration of the field research is predicted during the tourist season (during July and August), and the processing of collected biological data and analysis of socio-economic aspects through the autumn period. Therefore, the duration of this activity is planned in the period from 1st of June to 31st of December 2022.

3. Methodology and expected outcomes of the data collection activity

Field sampling for the purposes of this study will be performed on the commercial vessels engaged in fishing for tourist purposes. A qualitative and quantitative structure of the catch will be performed on board, which will include catch, discard and bycatch as well as possible marine litter. Also, the demographic structure (length, weight, sex, maturity, etc.) of the most important populations in the catches will be described. These data will be compared with the qualitative and quantitative structure as well as the demographic structure of the key populations collected through the DCF during commercial fishing in the same fishing area in the same season. In this way, it will be possible to assess the impact of this fishery on marine ecosystems and fishery resources and to correlate it with commercial fishing.

Through the survey, but also using data from official log-books, data on economic and social aspects of fishing will be collected, primarily information on earnings (catch value, tourism) and costs (fuel, fishing equipment, operating costs, etc.). Also, information will be collected from fishermen engaged in this activity on the problems they face and suggestions for possible solutions with the aim to establish adequate management mechanisms.

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

Funding of this activity was planned from the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) given that Croatia used up all allocated EMFF funds for data collection for the period 2014-2020.

In the course of 2022, informal consultation with the Commission was initiated on the adoption of the Partnership Agreement 2021-2027 with Croatia, and during this period the documentation for the initiation of the public procurement procedure was also prepared.

Given there were some delays in the consultation process for the Partnership Agreement 2021-2027 with Croatia, and consequently the Croatian EMFAF Programme, the Programme was informally agreed, including DCF financing, and officially adopted in the end of November 2022.

Following internal MA-DoF procedures, the pilot study underwent a public procurement process in early 2023, after which the contract was signed with the service provider (IOF) in late May 2023. Due to these circumstances, all planned activities have been adjusted as described below. Croatia will amend the Work Plan for 2024 in line with these changes.

Expected duration of the pilot study was adapted to 14 months, 12-month period for the implementation of activities and an extra two months for reporting of results, which are expected in late July 2024.

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

Not applicable.

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

Not applicable.

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.

Name of the study: RCGs supporting tools

1. Aim of the data collection activity

Developing and maintaining mechanisms to support the planning and execution of administrative tasks and the branding and online visibility of the RCGs. Follow-up for the Project SecWeb (MARE/2020/08) to have a long-term supportive structure for RCGs on administrative side. Functioning secretariat that gives administrative support for the RCG chairs and manage the RCG web page (<https://www.fisheries-rcg.eu/>)

2. Duration of the data collection activity

Starting from 2023.

SecWeb project duration was started 01/01/2021 and will end on 31/12/2022. This project is funded directly by DG MARE. Future funding after 2022 still needs to be determined. Dedicated agreement may be added in NWP in future revision.

3. Methodology and expected outcomes of the data collection activity

A detailed description of the secretariat functions, the implementation of the secretariat, the content of the website, the building blocks of the website and the business model for the provision of Secretariat role and website continuation (updating and maintenance) will be provided at the end of Project SecWeb in 2022, before submission of amended national WP for 2023.

The Regional Coordination Groups (RCGs) are the main hub for regional coordination and cooperation

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

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

Overarching, the service lines to be consolidated will cover:

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

Expected outcomes:

1. The provision of dedicated Secretariat support for the RCGs A consistent approach to administering RCG activities, facilitating communication, helping to drive intersessional work and supporting the work of sub-groups would significantly improve the performance of the RCGs..
2. A dynamic and permanently updated website including as features::
 - Integration (synchronization with third-party applications).
 - Responsive (to serve content across multiple screens and platforms).
 - User experience (maintain a consistently good user experience).
 - Accessibility (all levels of society and end-users need to be able to access in a friendly used way).
 - Retention (keep visitors coming back).
 - Links to protected part outside the website as repository for confidential documents.
3. Consolidated and Visual identity for RCGs and enhanced visibility and understanding of the work by the RCGs at least by the relevant stakeholder groups, enhancing the pathways for interaction with them.
4. Regular updated Stakeholders' database useful for the RCG experts and for the stakeholders' community.
5. Internal communication protocols and help-desk in place making it easier for any new comer to efficiently join, adopt responsibilities, and contribute to the RCGs objectives and work commitments.
6. A detailed description of the secretariat functions, operational working protocols and the business model for the provision of Secretariat role.

Future progress in continued support for regional coordination depends on the project's outcomes and the selected route to proceed and fund the required work. As regional coordination is the cornerstone of the collective approach to data collection, the continuation of the work may be embedded in a regional work plan in the future based on national input and support.

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

During 2022 the activities of the RCGs Secretariat still developed in the context of the SecWeb Project, which was extended to last until the end of February 2023. The RCG experts and the Member States' NCs

engaged in several discussions about the long-term stabilization of the Secretariat services, given the value added by the project to the RCGs networks, and agreed on a short-term solution for continuity in 2023 which was incorporated with a statement in "Text Box 1b: Other data collection activities" of the Annual Work Plans of the Member States. The long-term perspective will build upon the outcomes from SECWEB and dealt with inter-sessionally and pan regionally by ISSG NCs in 2023 and beyond.

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

Incorporation of study results into regular sampling by the Member State.
Not applicable.

SECTION 2: BIOLOGICAL DATA

Text Box 2.1: List of required species/stocks

(Region: Mediterranean Sea and Black Sea / RFMO: GFCM)

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

Deviations from the work plan

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

Regarding species, *Sardinia pilchardus* and *Engraulis encrasicolus* were oversampled without any additional cost.

Auxis rochei and *Atherina spp.* were not sampled in 2022 as no information on the landing was received.

Trachurus sp. and *Scomber colias* were sampled through PS srdelara as bycatch species as there was no sampling with PS lokardara.

Regarding species, *Merluccius merluccius* and *Mullus barbatus* were oversampled without any additional cost.

Solea solea was undersampled for biological data (age, maturity, sex ratio) due to poor catches in the warmer months.

Boops boops and *Spicara smaris* were undersampled for biological data (age, maturity, sex ratio) due to limited use of gears targeting these species.

Anguilla anguilla was undersampled due to very poor catches of this species in the fyke nets (the period when this species appears in the catches is very short and unpredictable).

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.

Atherina spp. is sampled according to national needs for their purpose of national Management plan for shore seine fishing in the Republic of Croatia - net "oližnica" and Management plan purse seine fishing in the

Republic of Croatia - net "oližnica". Refers to *A. boyeri* and *A. hepsetus*.

Due to lack of cooperation with fisherman using purse seine nets and seine nets targeting this species were not sampled. Actions regarding sampling of these gears will be in line with actions as described in Text Box 2.5. In addition, an ad-hoc national research project will be introduced if needed, focusing specifically on these gears.

Auxis rochei is required by EUMAP Table 1, ICCAT and Management plan for purse seine fishing in the Republic of Croatia - net "palamidara". This species is reported under FAO code FRZ by fishermen (*A. thazard* and *A. rochei*). Data on species level is given on the basis of sampling data. Unfortunately, during sampling trips of purse seine net "palamidara" there were no catches of this species. Croatia will consider increasing the number of sampling trips in the future.

Purse seine net "lokardara" is no longer planned in updated WP 2022-2024. Information needed for any future evaluation the management plan will be collected by ad-hoc research activities conducted on a national level and not included in WP for DCF.

(Region: Mediterranean Sea and Black Sea / RFMO: ICCAT)

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

Deviations from the work plan

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

Catches that were sampled following the annual work plan had more caught individuals of *Xiphias gladius* per catch than what was initially planned and scientific observers were able to sample the majority of the catch which is not always the case. Since the amount of caught *Xiphias gladius* with this fishing gear is unpredictable and varies from trip to trip this kind of deviation is common and it does not affect the financial plan since the number of PSU that are going to be sampled is planned and accounted for while the number of the individuals sampled varies from catch to catch.

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.

Deviation did not have a negative effect; therefore no actions are needed.

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

Text Box 2.2: Planning of sampling for biological variables

(Region: Mediterranean Sea and Black Sea / RFMO: GFCM)

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

the annual report and complements Table 2.2.

Deviations from the work plan

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

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

Cases of undersampling and oversampling of biological variables are described in Table 2.2.

Following species were undersampled:

Species	Biological parameter	Metier	MS comment
<i>Anguilla anguilla</i>	Weight, Sex	FYC_CAT	Undersampled due to low number of specimens in catches. Although successful cooperation was established between fishermen and scientific observers for fyke net sampling, in the period when work with this fishing gear was allowed (winter period), the eel catch was very small to none, and it was impossible to collect the planned number of specimens. Regardless of this, the data collected were used for the purpose of developing an eel management plan in the Republic of Croatia.
<i>Atherina spp.</i>	Weight	Purse seine net "oližnica" and seine net "oližnica"	Sampling was not successful due to the lack of cooperation with fisherman using purse seine net "oližnica" and seine net "oližnica".
<i>Auxis rochei</i>	Weight, Sex, Maturity	Purse seine net "palamidara"	Species was not sampled due to the lack of coordination with fisherman during sampling of PS net "palamidara"
<i>Boops boops</i>	Sex, Maturity	Beach seine nets "migavica" and "girarica"	Undersampled due to very limited use of the gear by fishermen (somewhat compensated through onboard sampling)
<i>Solea solea (Solea vulgaris)</i>	Age, Sex, Maturity	Dredge rampon	Due to low catch, the planned number of samples could not be reached. In addition to the low catches, fishermen are reluctant to give the samples to IOF, since much higher prices can be obtained in purchasing stations and, moreover, there is an agreement between them for the purchase of the entire quantity of catch of all commercial species.
<i>Spicara smaris</i>	Age, Sex, Maturity	Beach seine nets "migavica" and "girarica"	Undersampled due to very limited use of the gear by fishermen (somewhat compensated through onboard sampling)
<i>Trachurus trachurus</i>	Weight, Sex, Maturity	Purse seine net "oližnica"	PS lokardara was not sampled and low number of the species was found in the PS srdelara. Fishing activity of fisherman using this fishing gear was significantly limited in 2022 to certain areas and time periods, and it was not possible to carry out sampling.

Following species were oversampled:

<i>Boops boops</i>
<i>Mullus barbatus</i>
<i>Solea solea (Solea vulgaris)</i> (for weight)
<i>Xiphias gladius</i>

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.

For *Solea solea* more specimens will be collected in colder months when the species is caught more. Issue with *Boops boops* and *Spicara smaris* will heavily depend on the usage of beach seines which currently have significant temporal and spatial restrictions which also does not allow for proper sampling. Catches of *Anguilla anguilla* are very variable and majority of the catch occurs in just a few days. Therefore, timing of the sampling is essential and can be improved by better cooperation with the fishermen.

Actions as described in Text Box 2.5. are relevant for *Auxis rochei* and *Trachurus trachurus*.

(Region: Mediterranean Sea and Black Sea / RFMO: ICCAT)

General comment: This text box fulfils Article 5(2)(a), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 2.1(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

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

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

Catches that were sampled following the annual work plan had more caught individuals of *Xiphias gladius* per catch than what was initially planned and scientific observers were able to sample the majority of the catch which is not always the case. Since the amount of caught *Xiphias gladius* with this tool is unpredictable and varies from trip to trip this kind of deviation is common and it does not affect the financial plan since the number of PSU that are going to be sampled is planned and accounted for while the number of the individuals sampled varies from catch to catch.

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.

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

Text Box 2.3: Diadromous species data collection in freshwater

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

European eel / Inland waters

Method selected for collecting data.

The only species from the group of diadromous species in Croatia is *Anguilla anguilla*, European eel. The reported annual catch of this species is very small and is performed by commercial and sport and recreational fishing both in marine and inland fisheries.

Sampling for biological variables is planned to be carried out annually on-shore sampling on commercial fyke nets. During sampling in inland waters, data on the characteristics of the fishing gear will be collected (number, mesh size), as well as data on fishing effort and the information on the qualitative and quantitative composition of catches (target species, by-catch and discard). Data on length frequencies and biological data (length, individual weight, sex, maturity and age over otolith) will be collected for standing stock – yellow eel and emigrating silver eel.

The methodology for the monitoring, and the protocol will be designed for the purpose of reporting and evaluation referred to in Article 9 of Council Regulation (EC) No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel.

Field sampling of European eel (*Anguilla anguilla*) for biological variables according to Table 2.3 will be carried out in defined areas through direct sampling of the fishermen's catches at the location of fishing by scientific observers. This species is caught predominately by fyke nets.

Monitoring programme for the collection of biological variables by freshwater fishing areas will be designed by DoF according to the Croatian Freshwater Fisheries Act (OG 63/2019). The Croatian Fish stock monitoring program in freshwater fisheries which started in 2005 is an ongoing annual program of scientific monitoring of the state of fish stocks, conducted by institutions registered to perform activities in the field of freshwater fisheries, which is aimed at collecting and providing information for the purpose of fisheries management. Albeit the current monitoring program includes data collection for eel, monitoring of eel in inland waters was previously not conducted as targeted sampling activity, therefore the sampling scheme for eel will be designed in the first year of implementation to introduce a dedicated sampling programme for eel.

Areas of implementation of the Fish stock monitoring program in freshwater fisheries:

- 1) Drava - Dunav fishing area on rivers Drava and Dunav,
- 2) Sava fishing area on the river Sava,
- 3) Kupa fishing area including rivers Kupa, Dobra, Korana, Mrežnica and lake Lešće,
- 4) Lika fishing area including rivers Gacka, Novčica and Una,
- 5) Jadran (Adriatic) fishing area including rivers Krka, Mirna, Cetina, Rječina and Raša.

For the areas listed above biological data (length, weight, sex determination and age estimation) on eel populations will be collected. For the non-commercial part of the population the abundance of the standing population (yellow and silver eels) will be performed by fyke nets and other appropriate methods (to be defined in the first implementation year).

Were the planned numbers achieved? Yes/ No

No.

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

Funding of this activity was planned from the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) given that Croatia used up all allocated EMFF funds for data collection for the period 2014-2020.

In the course of 2022, informal consultation with the Commission was initiated on the adoption of the Partnership Agreement 2021-2027 with Croatia, and during this period the documentation for the initiation of the public procurement procedure was also prepared.

Given there were some delays in the consultation process for the Partnership Agreement 2021-2027 with Croatia, and consequently the Croatian EMFAF Programme, the Programme was informally agreed,

including DCF financing, and officially adopted in the end of November 2022.

Following internal MA-DoF procedures, the pilot study underwent a public procurement process in early 2023, after which the contract was signed with the service provider in late May 2023. Due to these circumstances, all planned activities have been adjusted as described below. Croatia will amend the Work Plan for 2024 in line with these changes.

Expected duration of the pilot study was adapted to 26 months, 24 month period for the implementation of activities and an extra two months for reporting of final results.

Text Box 2.4: Recreational Fisheries

(Region: Mediterranean Sea 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.

HRV REC FISH Survey

In Croatia, both recreational and sports fisheries are recognized and regulated through Marine Fishery Act and “The ordinance on sport and recreational fishing at sea”. Recreational and sports fishing activities are allowed only with the possession of daily, weekly, monthly or annual licenses. The Ordinance on sport and recreational fishing at sea prescribes type and quantity of fishing gear and equipment which fisherman is allowed to use, the type of license required for sport or recreational fishing at sea and the license for bottom longline fishing. Pursuant to the Ordinance, the licenses for sport and recreational fishing are issued by the Ministry of Agriculture (DoF) and licenced distributors for a specified purpose and period.

Currently, there is no obligation for recreational and sports fishers to report their catches nor any other data in relation to fishing. Systematic monitoring of catches in sport fishery is already established within the DCF for big game fishing competitions of large pelagic fish in relation to ICCAT species (see below) which is jointly conducted by the MA-DoF and IOF.

Starting from 2022, a systematic monitoring of recreational and sports fisheries in Croatia is envisaged. It will be undertaken jointly by MA-DoF, IOF and Croatian Sea Sport Fishing Association (CSSFA). A database of licenses issued for recreational and sport fishery is available and curated by DOF. Approximately 75 000 licenses are issued yearly. Of these, approx. 45 000 are annual recreational/sportive licenses while approx. 30 000 are daily, weekly or monthly licenses. Planned survey will take advantage of the MA-DoF license database which will be used for a random draw of users which will be asked to participate in the survey. A combination of recall survey and self-sampling by the means of log-books will be implemented. Both recall survey questionnaires and log-books will be designed and hosted on an on-line platform specifically designed for this purpose. Recall surveys will be aimed at the users of daily, weekly or monthly licenses since their engagement is unpredictable (licenses can be obtained throughout the year) while holders of yearly licenses will be provided with electronic identity which will enable access to the log-book. The log-book will be conceived on the basis of recommendations presented in the Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea by FAO. The same publication also includes guidelines on calculation of the sample size needed to provide accurate representation of the population of recreational and sports fishers. A total of 400 sampling units (fishers) will be sampled in the survey (the calculated number is

381) on a yearly basis. Non-respondents will be recorded. Most important data will be extracted by the log-book such as general socio-economic information (age, gender, employment status) of the fisherman, fishing effort and details about the daily catches in terms of species and their weight. Also, the fate of caught individuals will be recorded. Possibility of stratification of sampling will be considered according to fishing zone utilization provided beforehand by each licensed fisherman through the licensing system. Collected data will be stored in the database curated by IOF and DOF. Additionally, data collection on the sport competitions will be jointly undertaken by CSSFA and IOF.

At a later stage, DoF plans to implement an official system of electronic reporting for recreational and sports fishery.

Sport big game fishing competitions of large pelagic fish (BFT BGF REC): As this fishery catches highly migratory ICCAT species with allocated TAC for sport fishery (BFT) it will be recorded by IOF scientific observer on shore by sampling every BGF competition held during the year. All of the landed LP fish during the competitions will be sampled for biological data and variables.

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.

HRV REC FISH Survey

Funding of this activity was planned from the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) given that Croatia used up all allocated EMFF funds for data collection for the period 2014-2020.

In the course of 2022, informal consultation with the Commission was initiated on the adoption of the Partnership Agreement 2021-2027 with Croatia, and during this period the documentation for the initiation of the public procurement procedure was also prepared.

Given there were some delays in the consultation process for the Partnership Agreement 2021-2027 with Croatia, and consequently the Croatian EMFAF Programme, the Programme was informally agreed, including DCF financing, and officially adopted in the end of November 2022.

Following internal MA-DoF procedures, the HRV REC FISH survey underwent a public procurement process in early 2023, after which the contract was signed with the service provider (IOF) in late May 2023. Due to these circumstances, all planned activities have been adjusted as described below. Croatia will amend the Work Plan for 2024 in line with these changes.

Expected duration of the HRV REC FISH survey was adapted to 26 months, 24 month period for the implementation of activities and an extra two months for reporting of final results.

Recall survey is planned in 2023 to collect data for 2022 referent year.

Sport big game fishing competitions of large pelagic fish (BFT BGF REC):

No deviations, activities were carried out as planned.

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.

Not applicable.

Text Box 2.5: Sampling plan description for biological data

(Region: Mediterranean Sea and Black Sea / RFMO: GFCM)

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

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

Additional information on sampling schemes

Member State 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.

For Croatia, under sampling schemes type is noted commercial fishing for all stated metiers. Sampling strategy for each metier is designed partly as concurrency-at-sea (sampling directly on board by observers and scientists) and concurrency-at-landing site (sampling directly on landing site, at market etc.), taking also into account the Croatian fishing zones and their specificities. The target population for the reference year will be the number of fishing trips (fishing days) by metier of the previous years. The frame population is a subsample of the target population: it will be a selection of fishing trips, mainly on spatial (Croatian fishing zones and subzones) and time stratification basis (monthly, quarterly or annually) with measurements of the composition of the catch in order to detect seasonal differences in the demographic structure and composition of the landings for different metiers. Sampling scheme identifier is scientific observer on shore or scientific observer at sea.

In comparison to monitoring conducted in previous years, the sampling scheme for 2022-2024 was adjusted in order to increase the number of PSUs for on-board sampling by scientific observers for those metiers which have a higher risk of incidental catch of vulnerable species. In comparison to 2021, the number of planned sample units (fishing trips) for 2022-2024 has been increased by 25% in total (mostly due to increasing the number of PSU for on-board sampling by 65%). The highest increase of on-board observations is planned for metiers with higher risk of bycatch, including incidental catch of vulnerable species. More information is provided in section 4.2.

In addition to increasing PSU on shore, in the following period an increase of on-board sampling for commercial fisheries for key fishing gears will be performed:

- for bottom trawl an increase of on board sampling from 28 to 48 trips per year,
- purse seine for small pelagic fish from 36 to 54 trips per year,
- fixed nets GNS from 2 to 18 trips per year,
- fixed net GTR from 6 to 22 trips per year, and
- dredge DRB from 4 to 6 trips per year.

Additional description on sampling frames

Member State may add 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 columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

Fishing area under jurisdiction of the Republic of Croatia is divided into several fishing zones. Each zone has its own specific oceanographic and geomorphological characteristics and environmental conditions differ from

one zone to another. Selected species for monitoring are not equally distributed across the Adriatic Sea due to its biological and ecological characteristics. For some species there is strong variation in distribution between seasons due to migrations patterns, recruitment, spawning etc. Sampling scheme is designed to cover quarterly all fishing zones in Croatia in order to achieve representative length frequency distribution and to cover different life stages as well. Croatian fishing vessels operate exclusively in the Northern Adriatic Sea (GSA 17).

Purse seines: PS metiers

The most important fleet segment in terms of share in landing weight was the purse seine segment (PS, 90% of total landings weight) with less than 3% of total number of active vessels. This segment includes vessels which remain active the entire year and fishing activity represents the main activity. Several different PS metiers were identified in Croatia based on gear characteristics and target species assemblages. The main target species of metier PS “srdelara” are sardine (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*), this gear is managed under GFCM MAP. Several other metiers are selected for sampling based on the Management plans such as the purse seine called “igličara” with the main target species *Belone belone*, PS “oližnica” that targets *Atherina* spp. PS “ciplara” that targets the Mugilidae species, PS “lokardara” whose main target species is *Scomber colias*. PS “palamidara” targets the LPF *Sarda sarda*. This fishery is carried out in inner seas and territorial waters mostly on a seasonal basis.

Purse seine “srdelara”: PS_SPF_“SRDELARA” Sampling for purse seine for small pelagic fish species is planned to be conducted in 6 most important (in amount of landings) fishing zones in 9 months (three month in year are with fishing ban for this fishing gear) (54 on board), and once in quarter in each of four marine districts on landing place (16 samplings).

Purse seine “oližnica”: PS_SPF_“OLIŽNICA” Sampling will be carried out on landing place 4 times a year (once in the quarter). There will be no on-board sampling.

Purse seine “igličara”: PS_SPF_“IGLIČARA” Sampling will be done on the landing place 4 times a year (once in the quarter).

Purse seine “lokardara”; PS_SPF_“LOKARDARA” Sampling will be conducted twice a year on board (2 samplings) and two times on landing (2 samplings).

Purse seine “palamidara”: PS_LPF_“PALAMIDARA” Sampling is planned to be twice in the quarter in the landing place (in total 8 samplings).

Purse seine “ciplara”: PS_MPD_“CIPLARA” With this fishing gear sampling will be done twice a year on board of the vessel (2 samplings), and each quarter once on the landing place (4 times).

Demersal bottom trawls: OTB_DEF

The primary target species of this metier are red mullet (*Mullus barbatus*), hake (*Merluccius merluccius*), musky octopus (*Eledone moschata*), Norway lobster (*Nephrops norvegicus*) and deep-water rose shrimp (*Parapenaeus longirostris*). Species composition varies depending on the fishing zone. In fishing zone A, octopus and other cephalopods as well as sole (*Solea solea*) and red mullet are particularly important. In fishing zone C and D which can be considered to be an outer zone, further offshore, hake and Norway lobster dominate the catches to a larger extent. Catches in inner seas (zones E and G) are dominated by hake, red mullet and octopus, but in the northern area (zone E) Norway lobster is also important while in the southern area (zone G) other species are caught such as anglerfish, rays and sparids. The fishing zone beyond the territorial waters (zones H, I, J, K) are characterised by low fishing activity and catches due to fleet limitations (i.e. small vessels and limited engine power). This gear is managed under GFCM MAP for the Adriatic Sea.

Sampling by individual fishing zones is planned for the demersal trawl metier; in total 6 zones per year will be

covered 48 times on-board and 96 times at landing places.

Dredges: DRB_MOL_"RAMPON"

In beam trawl fisheries (dredge “rampon”) the main target assemblages are bivalves, mostly two species: the Mediterranean scallop *Pecten jacobaeus* and European flat oyster *Ostrea edulis*. However, three other commercially important species, the common sole *Solea solea*, European common cuttlefish *Sepia officinalis* and musky octopus *Eledone moschata* are frequently present in the beam trawl as by-catch. Beam trawl catch contributes relatively little to total production in Croatia (<1%), it is important in the northern Adriatic (Croatia) area wherein 116 vessels have a licence for this type of fishing. Among active vessels in 2019, the majority of 91 % belong to the smaller vessels, smaller than 15.

Sampling is planned for the dredges metier in total 6 times on-board and 10 times at landing places per year. Sampling of demersal trawl and dredges will be conducted seasonally in order to achieve optimum quarterly distribution of data.

Fixed nets: GNS/GTR metiers

The largest number of vessels in the main commercial fleet were active in fixed nets fishery. Several different metiers were identified in Croatia based on gear characteristics and target species assemblages. Gillnets for demersal species is a grouping of various traditional gillnets used in small-scale fisheries. The most important are called “prostica”, “psara” and “bukvara” which are similar but of different mesh sizes. Overall, catches are dominated by hake (*Merluccius merluccius*), bogue (*Boops boops*), horse mackerel (*Trachurus* spp.), picarel (*Spicara maena*), dogfish (*Mustelus mustelus* and *Squalus acanthias*) and mullets (*Mullus* spp.). Species composition varies depending on the net type. Trammel nets for demersal species is a grouping of three main traditional trammel net types used in small-scale fisheries. The type called “listarica” is used predominantly in the Istria area to catch common sole (*Solea solea*). The trammel nets called “poponica” are used in inner seas to catch various species including cephalopods, scorpion fish, hake, dogfish, and sparids, but the main target species is European hake. The trammel net “sipara” mainly targets the common cuttlefish (*Sepia officinalis*).

Trammel nets: GTR metiers

GTR_DEF_"LISTARICA": Trammel nets "LISTARICA" will be sampled during the entire year - 12 times on-board and 12 times at landing places.

GTR_DEF_"POPONICA": Trammel nets "POPONICA" will be sampled depending on the season when the gear is allowed to be used. Sampling will be carried out 8 times on board and 6 times at landing places.

GTR_DEF_"SIPARA": Trammel nets "SIPARA" will be sampled depending on the season when the gear is allowed to be used. Sampling will be carried out 2 times on board and 2 times at landing places.

Gillnets: GNS metiers

GNS_DEF_"POLANDARA": Gillnets "POLANDARA" will be sampled during the entire year 2 times on-board and 6 times at landing places.

GNS_DEF_"PROSTICA": Gillnets "PROSTICA" will be sampled during the entire year 10 times on-board and 16 times at landing places.

GNS_DEF_"PSARA": Gillnets "PSARA" will be sampled during the entire year 6 times on-board and 6 times at landing places.

Seine nets: SB-SV metiers

Beach and boat seines for demersal species is also a grouping of various traditional beach seine gears in use in small-scale fisheries. However, the type called “migavica” dominates with a varied catch composition

dominated by picarel (*Spicara* spp.) and including bogue, horse mackerel, red mullet, and various sparids. The remaining beach seines listed per share in the effort are “girarica” with the main target species *Spicara smaris*, “šabakun” is another type of seine net that is targeting the large fish (*Seriola dumerilii*, *Sarda sarda* etc.). This fishery is carried out predominantly in the inner seas.

SB_SV_DEF_"GIRARICA": Seine nets "GIRARICA" will be sampled depending on the season when the gear is allowed to be used. Sampling will be carried out 5 times on board and 8 times at landing places.

SB_SV_DEF_"MIGAVICA": Seine nets "MIGAVICA" will be sampled depending on the season when the gear is allowed to be used. Sampling will be carried out 5 times on board and 8 times at landing places.

SB_SV_DEF_"ŠABAKUN": Seine nets "ŠABAKUN" will be sampled depending on the season when the gear is allowed to be used. Sampling will be carried out 2 times at landing places. Conditional sampling in case of approved management plan for this gear type.

Set longlines: LLS_DEF

This metier consists mostly of small scale fishery vessels that usually operate both in inner and open waters. The main target assemblages are demersal species such as *Merluccius merluccius*, *Trigla lucerna* and *Scophthalmus rhombus*.

Set longlines will be sampled during the entire year 18 times on landing places.

Pots for crustaceans: FPO_DEF

This metier consists mostly of small scale fishery vessels that usually operate in inner sea and coastal areas. The main target assemblages are crustaceans.

Pots for crustaceans will be sampled bimonthly 12 times at landing places targeting catches of *Nephrops norvegicus*, *Homarus gammarus* and *Palinurus elephas*.

Fyke nets for eel: FYK_CAT

This metier consists mostly of small scale fishery vessels that usually operate in inner sea and coastal areas. The main target assemblage is demersal species, mostly European eel (*Anguilla anguilla*).

Field sampling of European eel (*Anguilla anguilla*) for biological variables according to Table 2.5 will be carried out in coastal areas through direct sampling of the fishermen's catches at the location of fishing by IOF scientific observers. This species is caught predominately by fyke nets which are used by a low number of licensed fishermen. Majority of landings of this species are reported for the area of Neretva River delta where the sampling will be carried out. The yearly reported landings are relatively low (approx. 500 kilos) of which the majority (>90%) is caught by fyke nets. Sampling will be carried out 4 times in the season when the use of this gear is allowed (autumn and winter). In each of the planned sampling trips, as many catches as possible will be sampled. Biological data will be obtained on landing place (length, weight) while a subsample will be obtained for laboratory analysis where age and sex of the specimens will be determined. Contacts of licensed fishermen will be provided by MA-DoF, while the sampling will be carried out by IOF in the area of Neretva River delta. During sampling, data on the characteristics of the fishing gear will be collected (number, mesh size), as well as data on fishing effort and the information on the qualitative and quantitative composition of catches (target species, by-catch and discard). Data on length frequencies and biological data (length, individual weight, sex, maturity and age over otolith) will be collected for standing stock – yellow eel and emigrating silver eel.

Opportunistic sampling for selected species (Table 2.2) will be conducted by IOF scientific observers on-board fishing vessels across all sampling frames.

Population out of sampling frame

Sampling frames (metiers) presented above were selected according to metier ranking procedure performed for the reference period (2018-2020) prior to submitting the WP. Cumulatively they represent more than 90% of landing, value, effort and discard or were selected due to other reasons (ie. gears included in national fishing gear management plans (MP)).

The only metiers which have not been selected by ranking procedure (out of frame) and will not be sampled are the following: FYK_DEF, LHP-LHM_CEP, LHP-LHM_FIF, LLD_LPF and MISC. For these metiers there is currently no specific management need related to fishing gear or target 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.

Purse seine net srdelara were oversampled due to the additional sampling for PET species.

Purse seine net lokardara and oližnica were not sampled at all. Unfortunately, fishermen are not inclined to cooperate with scientists on the collection for the *Atherina spp* (oližnica) and lokardara has very limited working area and period. PS ciplara was undersampled on board- there was a problem (lack of fisherman cooperation) in boarding the fishing vessel. For PS palamidara 75% of the planned sample rate was achieved.

GTR_DEF_"LISTARICA": undersampled (lacking 1 onboard and 3 landing samplings) due to weather conditions which impaired sampling dynamics.

GNS_DEF_"POLANDARA": lacked one on-board sampling due to weather conditions which impaired sampling dynamics.

GNS_DEF_"PROSTICA": lacked 2 on board samplings – the boats are small (less than 12 m) and it's not always possible to board them.

Metiers SB_SV_DEF_"GIRARICA" and SB_SV_DEF_"ŠABAKUN" were not sampled at all due to lack of fishing activities with these fishing gears. However, landings of SB_SV_DEF_"MIGAVICA" were oversampled (10 instead of 8 planned).

LLS_DEF was undersampled (short of 1 landing) due to weather conditions which impaired sampling dynamics.

OTB_DEF was undersampled (short of 16 landings) due to bad weather and malfunction of the vessel.

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.

In collaboration between IOF and MA-DoF an online questionnaire was distributed in 2023 to fisherman cooperating with IOF thus far, aimed at enhancing cooperation of scientific observers and fisherman, and identifying potential issues which may negatively affect cooperation, and understanding the reasons as to why some fisherman may be reluctant to participate in the monitoring. Although a relatively small number of fishers replied, obtained results were informative and useful.

In 2023, Croatia adopted the Ordinance on the conditions and method of work of authorized observers in fisheries ([OG 52/2023](#)). With the aim of promoting cooperation with fisherman to participate in the scientific monitoring programme, the Ordinance contains a provision on the publication of an annual list of fishing

vessels that are required to participate in the scientific monitoring, based on the catch in the previous year and authorizations issued for particular fishing gears, and in accordance with the sampling plan for individual fishing zones of the Republic of Croatia established by IOF.

Immediately after the adoption of the Ordinance, MA-DoF published the [list of vessels](#) for 2023, including also an [information leaflet](#). Although IOF had established a cooperation with a group of fishers prior to the publication of the list of vessels, the aim of the list is to increase the number of fishers participating in monitoring, taking also into account that they are not compensated in any way.

In addition, the mandatory professional training of commercial fisherman includes a curriculum unit for nature and environment protection since 2019, with a module – Identification of vulnerable species, toolkit, and safe handling practices (Ordinance on professional training for commercial fishing, OG 11/19 and 23/22) and well as basic information on the scientific monitoring programme.

Further educational activities are planned during 2023/2024.

(Region: Mediterranean Sea and Black Sea / RFMO: ICCAT)

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

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

Additional information on sampling schemes

Member State 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.

Commercial fisheries included here catch highly migratory ICCAT species and are sampled for Bluefin tuna *Thunnus thynnus* (BFT) and swordfish *Xiphias gladius* (SWO). Based on the type of gear and the targeted species sampling is separated in three metiers:

PS_LPF_BFT: Large purse seiners targeting BFT using individual quotas. The fishing season is restricted from 26th of May until 1st of July. This BFT fishery is based on farming activities which means that BFT is not landed but transferred live into cages. Metier shall be covered by all relevant monitoring and data collection activities. Only a small percentage (less than 1%) of the fish is recorded as a mortality which will be sampled by IOF scientific observers on board.

LHP-LLD_SWO: This metier includes commercial catch of SWO by drifting longlines and hand and pole lines. Sampling programme will target individual quota of vessels registered for this activity during their fishing season that lasts from 10th of April until the end of the year or until the designated quota has been fulfilled.

LHP-LLD_BFT: Sampling programme will encompass commercial catch that is part of the TAC used by a number of registered vessels that catch BFT by drifting longlines hand and pole lines during their fishing season that lasts from 15th of February to the end of the year or until they fulfil their individually allowed quota.

For all the above-mentioned metiers minimum number of 100 samples of BFT and minimum of 30 samples of swordfish is planned to be collected as indicated in table 2.2.

Additional information on sampling schemes

Member State 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

Member State may add 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 columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

LHP-LLD_SWO, LHP-LLD_BFT:

Change from the previous years is integration of different fishing gears in the same metier based on the targeted species they catch. Since most registered fishing vessels are under 15m they have and use licenses for both fishing gears (drifting longline and hand and pole line) and the catch quantity may greatly differ when looking at a vessel/gear based on their current fishing gear preference. Therefore, sampling based on targeted species should provide better results. This includes incorporating drifting longlines and hand and pole lines in the same metier, one that targets Bluefin tuna and second metier that targets swordfish.

Population out of sampling frame

There are no metiers out of sampling frame. All metiers relevant to ICCAT are included in the sampling scheme.

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.

LHP-LLD_BFT Catches (All fractions): There were less on-board samplings than it was planned. With last year's inflation and rising fuel price the cost of a single fishing trip has greatly increased for fishermen. Because of this they started practising multiple days at sea instead of one day as was usual in the previous years. As all the fishing vessels are under 15m and they cannot accommodate additional people except the fishing crew it is not possible for a scientific observer to perform on board sampling. Attempts were made to arrange on-board sampling for 1 day fishing trips, however due to bad weather conditions and issues with the fish distributions those attempts ended up unsuccessful and it was only possible to sample the current catch at landing.

LHP-LLD_SWO Catches (All fractions): There were less on-board samplings than it was planned. With last year's inflation and rising fuel price the cost of a single fishing trip has greatly increased for fishermen. Because of this they started practising multiple days at sea instead of one day as was usual in the previous years. As all of the fishing vessels are under 15m and they cannot accommodate additional people except the fishing crew it is not possible for a scientific observer to perform on-board sampling. Attempts were made to arrange on-board sampling for 1 day fishing trips, however due to bad weather conditions those attempts ended up unsuccessful.

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.

Constant communication with the fishermen is essential to arrange on-board sampling for the one-day long fishing trips as they happen since the multiple day fishing trip practice will continue as the economic situation is still serious. Furthermore, where the planned trips are not achieved according to schedule, additional landing samplings will be made to cover the planned total number of PSU sampling and/or number of individuals that are designed to be sampled.

Text Box 2.6: Research surveys at sea

(Research survey: Pan-Mediterranean Acoustic Survey (MEDIAS))

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

1. Objectives of the survey

Evaluate the abundance and spatial distribution of small pelagic fish resources by direct methods (acoustics), independently of the data provided by commercial fisheries; Target species are anchovy and sardine.

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.

Survey is conducted in the summer-autumn period of the year. Acoustic data for fish abundance estimation are collected by calibrated scientific echo sounder at 38kHz; Fish samples are collected by use of pelagic trawl net, with aim to provide information needed for echograms scrutinization, as well as for collection of fish biological data; Abiotic environmental data (measurements of temperature and salinity) collections are made by CTD vertical profiles, while additional biotic data in pelagic ecosystem are obtained by plankton sampling (acoustic at 120kHz and/or vertical hauls). Collection of navigational data ensures that all other collected data are geo-referenced (suitable for spatial analyses). Manual of the survey is available at <http://www.medias-project.eu/medias/website/handbooks-menu.html>, and it contains a graphical map of the surveys.

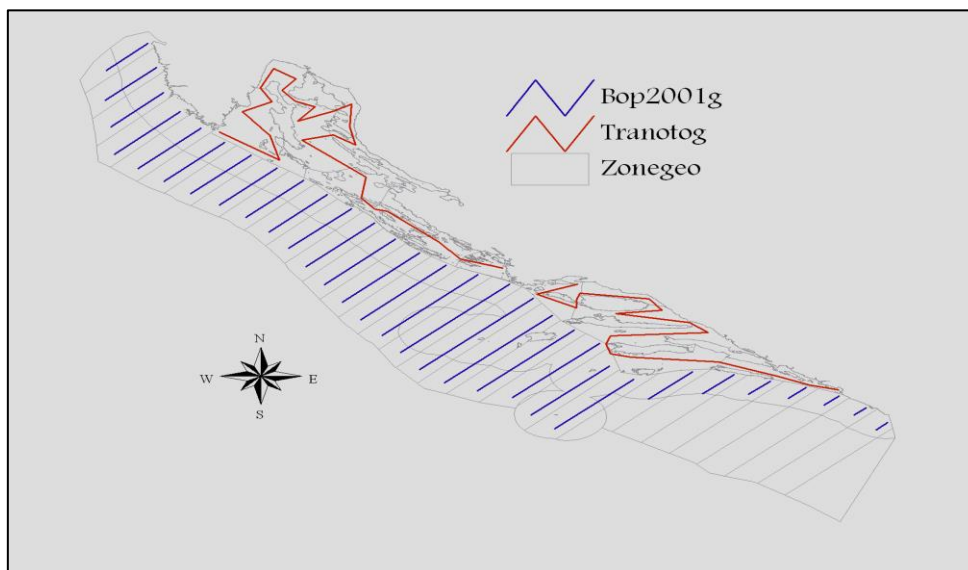


Figure 1. Map of acoustic survey in eastern part of GSA 17 during MEDIAS-DCF survey. Blue transects in the open sea and red transects in inner sea.



Figure 2. Example of spatial position of the CTD stations at which the measurements were made during the echo-monitoring DCF MEDIAS. The number and positions of stations can vary from year to year. Source: <http://jadran.izor.hr/roscoop/>.

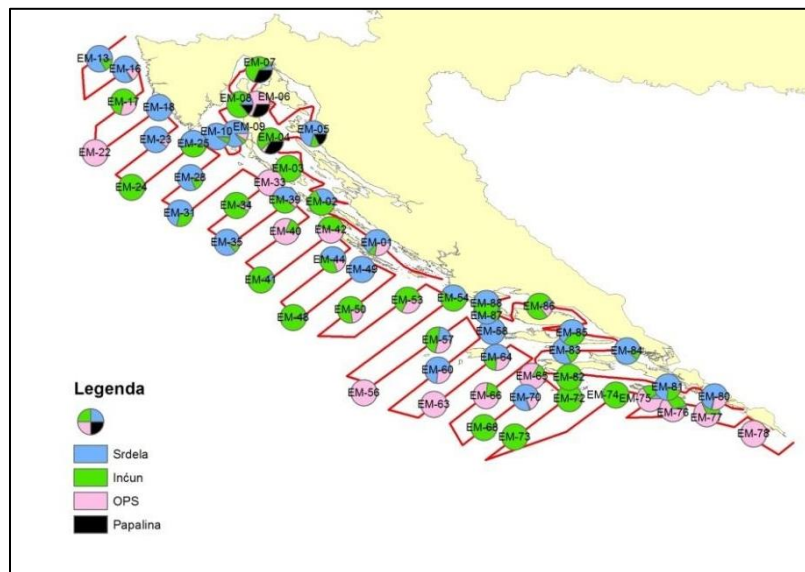


Figure 3. Example of spatial distribution of sampling and composition of catches achieved with the pelagic trawl along acoustic transects (green - anchovy, blue - sardine, black - sprat, and red - OPS). The number and positions of stations can vary from year to year.

Survey protocol is available at the national DCF webpage:
<https://podaci.ribarstvo.hr/files/MEDIASHandbookApril2021.pdf>

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

Croatia is participating in MEDIAS by conducting an acoustic survey in the eastern part of GSA 17 area (Adriatic Sea), covering an area of 13,578 Nm². International MEDIAS Steering Committee is in charge of surveys planning.

Survey is conducted by IOFs research/survey vessel BIOS DVA:

<http://acta.izor.hr/wp/istrazivacki-brodovi/bios-dva/>

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

Not applicable.

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).

Meeting of MEDIAS (MEDiteranean International Acoustic Surveys) Steering Committee was held in Ljubljana, Slovenia, while participation was possible both in person and through Zoom. Meeting was held from 18th to 20th of April 2022. It was chaired by Tarek Hattab (IFREMER). Meeting report is available at <http://www.medias-project.eu/medias/website/meetingrep.html>

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.

If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

Results of the survey are used in international context (GFCM and STECF) as contribution to analytical stock assessments of anchovy and sardine in the Adriatic Sea. Results are used for assessment tuning purposes.

7. Extended comments

Extended AR comments can be placed under this section.

Survey results are not directly used for the formulation of management advice, but as a contribution to analytical assessment (e.g. for tuning purposes). Oceanographic data (CTD) currently are not used for advice, but are potentially useful if could be related to recruitment index. These data are currently used to calculate sound speed as an input parameter for the echo sounder and to describe oceanography of the area surveyed.

(Research survey: International bottom trawl survey in the Mediterranean (MEDITS))

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

1. Objectives of the survey

The MEDITS survey programme intends to produce basic information on benthic and demersal species in terms of population distribution as well as demographic structure, on the continental shelves and along the upper slopes at a global scale in the Mediterranean Sea, through systematic bottom trawl surveys.

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

The MEDITS is conducted in spring - summer period from May to July based on MEDITS protocol using specially designed bottom trawl net GOC 73. Sampling stations are randomly distributed according to the

depth strata (10-50; 50-100; 100-200; 200-500; 500-800 m) and the number of stations is proportional to the surface of each stratum (Figure 1). The duration of tow in the area shallower than 200 m is 30 min, while in the area deeper than 200 m is 60 min. On board the vessel, the catches are split into the categories and sub-categories as reported in Annex V and XV of the manual. For each species the total weight and number of individuals should be collected, excluding the taxonomic category V, G, H for which only the total weight should be collected. For taxonomic categories D and E the number of individuals is not mandatory. When the catch of a given species or a fraction of a given species (e.g. juveniles) is too abundant to be measured *in extenso* it is reasonable to take a representative sub-sample of the catch. This sub-sample should be not less than 100 individuals.

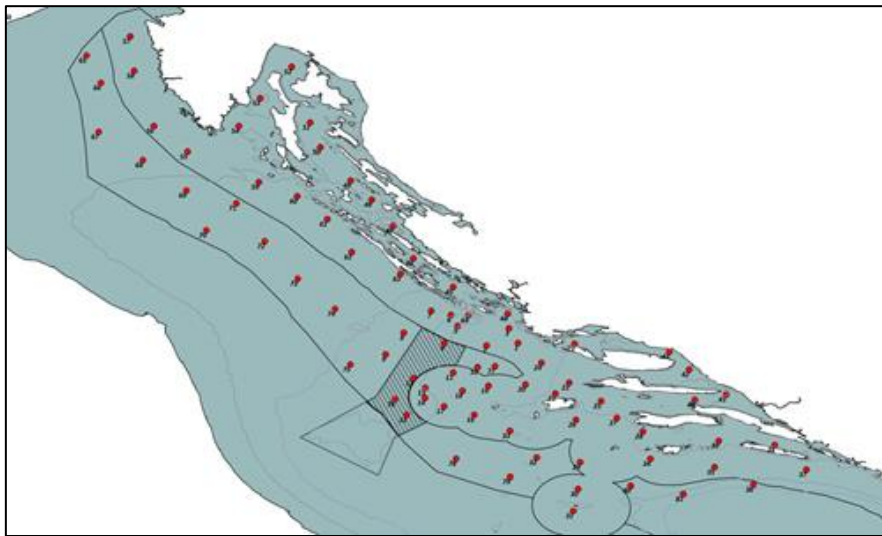


Figure 4. Map of sampling positions during the MEDITS survey in GSA 17 (Eastern side).

Survey protocol is available at the national DCF webpage:

https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf

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

Croatia is participating in MEDITS Surveys by conducting a bottom trawl survey in the eastern part of GSA17 area (Adriatic Sea), covering an area of 55.000 km². MEDITS Working Group is in charge of survey planning.

Survey is conducted by IOFs research/survey vessel BIOS DVA:

<http://acta.izor.hr/wp/istrazivacki-brodovi/bios-dva/>

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

Not applicable.

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).

Meeting of MEDITS (MEDiteranean International Bottom Trawl Surveys) Steering Committee was held in Ljubljana, Slovenia, while participation was possible both in person and through Zoom. Meeting was held from 24 to 25 October 2022. Meeting report is not available online.

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.

Results of the survey are used in international context (GFCM and STECF) as contribution to analytical stock assessments of demersal species in the Adriatic Sea, for assessment tuning purposes.

7. Extended comments

Extended AR comments can be placed under this section.

Not relevant.

(max. 450 words per survey)

(Research survey: Adriatic Rapido Trawl Survey (SOLEMON))

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.

1. Objectives of the survey

Solea solea is an important resource in the GFCM area. About 22% of the GFCM landings of soles come from the Adriatic Sea. In the GSA17 soles are targeted by “rapido” trawl and set nets by around 500 vessels, for a total of 1,600 fishermen and an annual value of landings of around 40 million Euros.

The main survey objectives are:

- a) Assessing abundance, distribution in GSA17 of sole and other important demersal resources by surveys with “rapido” gears suitable to seize flatfish and other benthic animals.
- b) Pursuing the studies on the ecosystem impact of the “rapido” trawl fishery.
- c) Contribution to the setting of the GES and targets for the Adriatic Sea in the framework of an ecosystem approach, thus matching to the requirement of the implementation of the Marine Strategy Framework Directive - MSFD (Directive 2008/56/EC).

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

The survey will cover the sole presence within the GSA 17 that, according to the genetic information, pertains as a single stock (Figure 5). The survey is planned to be conducted in the autumn period (October - December). All this holds also for benthic fish and shellfish of commercial interest, including rays and other selachians, since the EU greatly focuses on such vulnerable resources. Since 2005 the same gear and protocol has been used. The gear was a modified beam trawl named as “rapido” trawl. The gear was appositely planned to be fished on different types of bottom. The survey vessel utilizes two gears simultaneously; taking the characteristics of the gear and the rigging into account the warps should have a diameter of 14-16 mm. The length of warps to be shot is determined by the depth. The gear positioned in the right side of the vessel has 15 m of warp more than the other, in order to avoid possible interference between the two gears during the haul.

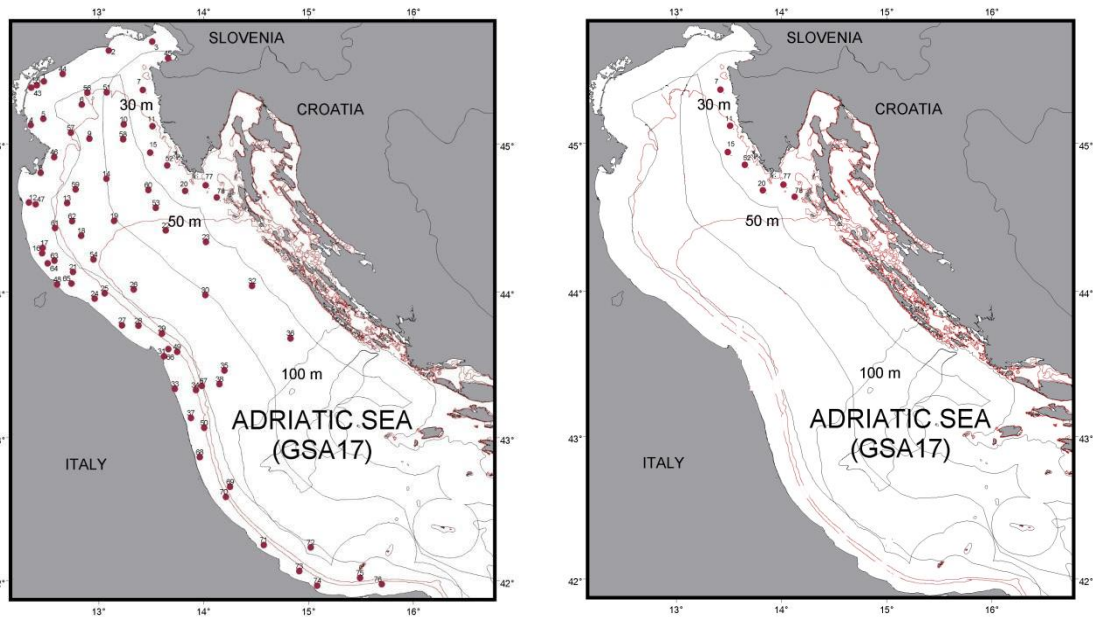


Figure 5. (left) Map of SOLEMON hauls in the Adriatic, GSA 17 (74 hauls). Borders between MS are indicative and without prejudice to territorial boundaries.

Figure 6. (right) Croatian hauls in the Adriatic Sea, GSA 17 (7 hauls).

Survey protocol is available at the national DCF webpage:

https://podaci.ribarstvo.hr/files/SOLEMON-Handbook_2019_Ver_4.pdf

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

Data will be shared in working groups both at EU (STECF and ICES) and Mediterranean level (FAO-GFCM), and with all Member States of AdriaMed through common database AtrIS.

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

Not applicable.

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).

Not applicable.

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.

Results of the survey are used in international context (GFCM and STECF) as contribution to analytical stock assessments of demersal species in the Adriatic Sea, for assessment tuning purposes.

7. Extended comments

Extended AR comments can be placed under this section.

Not relevant.

SECTION 3: FISHING ACTIVITY DATA

Text Box 3.1: Fishing activity variables data collection strategy

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

Data collection in Croatia implemented according to the Control Regulation (EC) No 1224/2009 and national regulation prescribed in the Marine Fisheries Act (OG 62/17, 130/17 – Act aquaculture and 14/19) is of sufficient quality and aggregation level for the intended scientific use according to Article 5 (2)(c), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 3.1 of the EU MAP Delegated Decision annex. Therefore, no complimentary data collection is foreseen.

Table 3.1 is provided for national purposes as an overview of data needed for DCF reporting.

Deviations from the work plan

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

No deviations.

Actions to avoid deviations

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

Not applicable.

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

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

In Croatia, fisheries for European eel (*Anguilla anguilla*) is permitted both in sport and commercial fisheries.

Fishing activity variables on inland eel commercial fisheries - landings, effort and capacity data collection according to Table 6 of Commission Delegated Decision (EU) 2021/1167, including number of licences, fishing days, number of trips and landings by gear, will be collected by MA-DoF according to Articles 46 and 47 of the Croatian Freshwater Fisheries Act (OG 63/2019).

Relevant national bylaws including Ordinance on sport fishing in freshwater fisheries (OG 81/2021) and the Ordinance on commercial fishing in freshwater fisheries regulate the obligation of fishermen to record and submit data on retained catches of fish via mobile application in sports and commercial fisheries.

Inland sport fisheries

Freshwater fishing right holders have an access to the database through the application, so that they can plan restocking and organization of the fish protection service and other elements of fish stock management in the fishing zone for which they obtained a fishing right. Finally, the data will be used for the needs of fisheries inspection in the supervision of the work of fishing rights holders. The retained catch of allochthonous (foreign) fish species is recorded as well, which will contribute to monitoring the incidence of catches and the expansion of the range of these species in the Republic of Croatia.

Authorized mobile data collection system m-Ribič, and an identical web application is designed so that MA-DoF and fishing right holder can have real-time data on the retained catch of the fisherman in his fishing zone so that he can plan restocking and better organize fisheries supervision. Accurate and up-to-date data are the basis for rational and sustainable management of the fish stock for the purpose of sport fishing and conservation of fish populations.

Inland commercial fisheries

Mobile and web application m-Alas has been developed in accordance with the Ordinance on commercial fishing in freshwater fisheries. Licence holder is obligated to report on retained catches (weight in kg and number by species) after returning from fishing, and immediately after sorting caught (retained) fish on board, and before disembarkation in real time. In addition to the data on retained catch, the licence holder is obliged to report relevant fishing zone where the catch was made, date, time and place of departure, date, time and place of return from fishing, fishing gear, registration number of the vessel, the make / type of propulsion machine and the power expressed in kW, and the date, time and place of landing of the retained catch. This application is important for monitoring traceability of fish in accordance with market regulations as well as food safety.

Landing data by eel life stage will be derived according to monitoring data.

Deviations from the work plan

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

No deviations.

Actions to avoid deviations

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

Not applicable.

SECTION 4: IMPACT OF FISHERIES ON MARINE BIOLOGICAL RESOURCES

Text Box 4.2: Incidental catches of sensitive species

(Region: Mediterranean Sea and Black Sea / RFMO: GFCM)

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.

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

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

Yes.

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

Demersal trawls, bottom longlines and fixed nets are considered to be gear with the highest risk for by catch of PETS on the level of GFCM. These gears were included in the Pilot study performed in the previous implementation period.

Following metiers are considered to be high risk metiers according to national assessment, based on the results of monitoring in the previous period and pilot study. For all listed “high risk” metiers Croatia increased on-board sampling coverage during scientific monitoring and introduced additional sampling methods (presented in Section 4.3) in order to achieve the coverage of fishing effort by PETS observation as suggested by the GFCM methodology for data collection (FAO. 2019. *Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries*). Coverage for most metiers considered “high risk” is over the suggested minimum coverage as presented in the tables below.

Sampling frame identifier (Metier)	PETS group	Coverage
OTB_DEF	E, T, INB	1,4%
PS_SPF_"SRDELARA"	E	0,8%
DRB_MOL_"RAMPON"	INB	1,6%
GTR_DEF	M, E, T	0,5%
GNS_DEF	M, E, T	0,5%
LLS_DEF	B, E	0,6%
LHP-LLD_BFT	B, E, T	19,7%
LHP-LLD_SWO	B, E, T	21%
PS_LPF_BFT	E, T	100%
BFT_BGF_REC	E	100%

PETS groups: M - marine mammals, E - elasmobranchs, T - marine turtles, B - marine birds, INB - macrobenthic invertebrates.

- What are the methods to calculate the observation effort?

For metiers listed in Table 2.5 on board sampling bycatch is recorded by scientific observers for the entire duration of the fishing trip (observation effort equals sampling effort). Additionally, a questionnaire will be developed and used in order to extract information about bycatch at landing sites. Fishermen will be asked to provide information about quantitative and qualitative structure of the bycatch as well as the faith of caught individuals. They will also be instructed to photograph bycatch for the purpose of accurate identification of species. Methods are calculated according to GFCM protocol. The scientific observer is indicated to monitor all of the bycatches during the entire fishing trip.

PETS bycatch observation effort is calculated taking into account the number of sampled fishing trips (landing and on-board) during which scientific observers and dedicated PETS bycatch observers record PETS observations, including additional sampling methods presented in Section 4.3. Assessment grid by metier/ species group and calculation of sampling coverage is presented in the table below.

Table 2. Complete overview of PETS bycatch observation effort

Sampling frame identifier (Metier)	Sampling frames		WP Sections 2.4 & 2.5		Risk assessment		WP Sections 2.4 & 2.5		WP Section 4.3		Other	Total observation effort			
	Effort	0,5% Effort	Number of PSU		High risk	PETS group	SCIENTIFIC OBSERVER		PETS BYCATCH OBSERVER		Experimental	REGIONAL OBSERVER	Total PSU for PETS bycatch estimation	Total sampling coverage for PETS	PETS by-catch estimation
			Landing	On-board			Landing	On-board	On-board	Landing	On-board	On-board			
OTB_DEF	22.749	114	96	48	Yes	E, T, INB	96	48	36	60	80	-	320	1,4%	Yes
PS_SPF_SRDELARA	16.903	85	16	54	Yes	E	16	54	12	60	-	-	142	0,8%	Yes
DRB_MOL_RAMPON	2.691	13	10	6	Yes	INB	10	6	6	20	-	-	42	1,6%	Yes
FPO_DEF	18.825	94	12	0	No	-	0	0	-	-	-	-	0	0,0%	No
PS_MPD_CIPLARA	931	5	4	2	No	-	0	2	-	-	-	-	2	0,2%	No
PS_SPF_OLIZNICA	90	0	4	0	No	-	0	0	-	-	-	-	0	0,0%	No
PS_SPF_IGLICARA	111	1	4	0	No	-	0	0	-	-	-	-	0	0,0%	No
PS_SPF_LOKARDARA	418	2	2	2	No	-	0	2	-	-	-	-	2	0,5%	No
PS_LPF_PALAMIDARA	556	3	8	0	No	-	0	0	-	-	-	-	0	0,0%	No
GTR_DEF_LISTARICA			12	12			12	12			-	-			Yes
GTR_DEF_POAPONICA	31.546	158	6	8	Yes	M, E, T	6	8	-	100	-	-	142	0,5%	Yes
GTR_DEF_SIPARA			2	2			2	2	-		-	-			Yes
GNS_DEF_POLANDARA			6	2			6	2	-		-	-			Yes
GNS_DEF_PROSTICA	41.735	209	16	10	Yes	M, E, T	16	10	-	150	-	-	196	0,5%	Yes
GNS_DEF_PSARA			6	6			6	6	-		-	-			Yes
SB_SV_DEF_GIRARICA			8	5			8	5	-	-	-	-			Yes
SB_SV_DEF_MIGAVICA	1.491	7	8	5	No	-	8	5	-	-	-	-	28	1,9%	Yes
SB_SV_DEF_SABAKUN			2	0			2	0	-	-	-	-			Yes
LLS_DEF	10.330	52	18	0	Yes	B, E	18	0	-	40	-	-	58	0,6%	Yes
LHP-LLD_BFT	442	2	26	6	Yes	B, E, T	26	6	-	55	-	-	87	19,7%	Yes
LHP-LLD_SWO	291	1	17	4	Yes	B, E, T	17	4	-	40	-	-	61	21,0%	Yes
PS_LPF_BFT	77	0	0	10	Yes	E, T	0	10	-	-	-	77	87	113,0%	Yes
FYK_CAT	85	0,05	4	0	No	-	4	0	-	-	-	-	4	4,7%	No
BFT_BGF_REC	10	0	10	0	Yes	E	10	0	-	-	-	-	10	100,0%	Yes
Total			297	182			263	182	54	525	80	77	1.117		

*Effort is presented as average fishing trips in reference period 2018-2020. PSU-planned sample unit. PETS groups: M - marine mammals, E - elasmobranchs, T - marine turtles, B - marine birds, INB - macrobenthic invertebrates. "Other" refers to ICCAT regional observer programme (ROP).

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

Yes.

RCG MED & BS 2021 Recommendation 8: Agreement on methodology for data collection on incidental catch of vulnerable species on the following methodology:

FAO. 2019. Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 640. Rome, FAO: <https://www.fao.org/gfcm/publications/series/technical-paper/640/en/>

List of national protocols:

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

National methodology:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

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

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

Yes (same as above).

- 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?

Not applicable.

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

Yes. The scientific observer is indicated to monitor all of the bycatches during the entire fishing trip. During separation of the catches, the observer is primarily instructed to record catches of PETS.

Additional information on sampling schemes

Member State 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.

Not applicable.

Additional description on sampling frames

Member State may add 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 columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

Not applicable.

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).

Detailed results are not available at the time of the submission of AR 2022 on 31 May 2023. Expected data availability is June 30th 2023 in line with planned activities (Table 1.1).

All planned activities were carried out and data is being processed at the time of the submission of AR-2022.

Number of records by species group (preliminary data):

Method	Species group	DRB_DEF Rampon	GTR_DEF Listarica	GNS_DEF Polandara	GTR_DEF Poponica	GNS_DEF Prostica	GNS_DEF Psara	GTR_DEF Sipara	PS_SPF Plivarica srdelara	PS_LPF Plivarica tunolovka	LLD_SWO	LHP_LLD- BFT	OTB DEF	LLS_DEF
IOF	Questionnaire	7	1	-	-	-	-	-	2	-	9	2	29	-
		-	-	-	6	-	-	-	-	-	-	-	7	2
IOF	Experimental video recording	-	-	1	-	3	9	-	-	-	35	18	-	3
		-	-	-	-	-	-	-	-	-	-	-	13	-
IOF Scientific observer programme	Landing	-	-	-	-	-	-	-	-	-	-	2	-	-
		-	-	-	-	-	-	-	-	-	-	2	-	-
	On-board	5,325	-	-	1	-	-	-	-	-	-	-	15,538	-
		-	-	-	-	-	-	-	-	-	-	-	6	-
		-	-	-	1	-	-	-	-	-	-	-	-	-
		-	-	1	-	-	2	3	-	-	-	-	-	4
Additional observers only for PETS	Benthic species	450	-	-	-	-	-	-	-	-	-	-	1,043	-
	Sharks, Rays, Chimaeras	-	-	-	-	-	-	-	-	-	-	-	1	-
ICCAT ROP observer	Sea turtles	-	-	-	-	-	-	-	-	8	-	-	-	-
	Sharks, Rays, Chimaeras	-	-	-	-	-	-	-	-	17	-	-	-	-

After finalizing the data processing in June 2023, the results (PETS BYC 2022 report) will be made available on the national DCF web site: <https://podaci.ribarstvo.hr/>

More importantly, Croatia plans to present the results on a national level to the environmental authorities, relevant NGOs, and fishing sector, as well as on the level of GFCM, at the earliest possible opportunity.

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.

Deviations are related to undersampling of relevant metiers, as explained in Text Box and Table 2.5. However, a very high overall sampling rate of fishing trips including combined PETS observation methodologies was achieved (around 90% of the planned sampling trips were realised, corresponding to 1.000 sampling trips).

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.

Following the presentation of results in relevant national, RCG and GFCM meetings, Croatia will amend planned activities as needed. Cooperation with fisherman is expected to be improved in the future period given that as of May 2023 Croatia adopted the Ordinance on the conditions and method of work of authorized

observers in fisheries (OG 52/2023). The new Ordinance is aimed at improving cooperation with fisherman to participate in the scientific monitoring programme, and it includes provisions of conduct in cases of recurrent non-cooperation.

(Region: Mediterranean Sea and Black Sea / RFMO: ICCAT)

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.

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

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

Yes.

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

Drifting longlines that target swordfish and Bluefin tuna have the highest risk of bycatch of PETS species (mostly elasmobranchs and marine birds). Occurrence of bycatch in BFT purse seine operations is mitigated by release of majority of the bycatch PETS species from the net directly to the sea by divers prior to the transfer of caught BFT to towing cages. The remaining recording bycatch is mostly rays. In regard to marine mammals there has been no recorded interaction with gears that target ICCAT highly migratory species.

- What are the methods to calculate the observation effort?

For BFT purse seiner there is no need to calculate the effort since there is 100% coverage of all fishing operations by ICCAT (ROP) regional observers that record the bycatch. For all the other fishing gears that catch highly migratory ICCAT species, including drifting longlines, bycatch is recorded by IOF scientific observers that perform sampling during the fishing trips and questionnaires on occurrence of PETS species bycatch for every landing that is sampled.

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

Yes.

ICCAT Recommendations relating to observer programmes and duties of observers.

Recommendation by ICCAT amending the recommendation 18-02 establishing a multi-annual management plan from Bluefin tuna in the Eastern Atlantic and the Mediterranean.

RCG MED & BS 2021 Recommendation 8: Agreement on methodology for data collection on incidental catch of vulnerable species on the following methodology:

FAO. 2019. Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 640. Rome, FAO: <https://www.fao.org/gfcm/publications/series/technical-paper/640/en/>

List of national protocols:

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

National methodology:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

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

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

Not applicable.

- 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?

Not applicable.

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

Not applicable.

Additional information on sampling schemes

Member State 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.

Not applicable.

Additional description on sampling frames

Member State may add 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 columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

Not applicable.

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).

LHP-LLD_BFT: Information on 90 bycatch observations was collected through scientific observation on-board and landing and PETS bycatch observations on landing. Total of 14 *Prionace glauca*, 3 *Alopias vulpinus*, 1 *Mobula mobular*, 2 *Caretta caretta* were caught by hook and subsequently released alive without landing them on the fishing vessel. There was also one fishing trip where 2 *Sterna hirundo* got hooked but were immediately released alive by the fishermen.

LHP-LLD_SWO: Information on 37 bycatch observations was collected through scientific observation on-board and landing and PETS bycatch observations on landing. There were 30 recorded catches by hook of *Prionace glauca* and 11 of *Caretta caretta* of which 3 *Caretta caretta* were released alive while the state of the animal when released is unknown for the rest of the reported bycatch.

PS_LPF_BFT: Information on bycatch observations for all fishing operations made in the year 2022 was collected through on-board observations by regional observers (ICCAT ROP observers). There were a total of 2 *Prionace glauca* that were released from the net alive, 7 *Caretta caretta* that were released from the net alive and 3 *Caretta caretta* that were seen only in transfer video, 7 *Dasyatis sp.* that were released from the net alive, 10 *Dasyatis sp.* that were seen only in transfer video and finally 1 on-board and discarded *Dasyatis sp.*

BFT_BGF_REC: Information on bycatch observations for all held big game fishing competitions in 2022 was collected through PETS bycatch observations on landing. There was a total of 6 *Prionace glauca* caught by hook that were released alive without landing them on the fishing vessel.

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 lower numbers of PETS bycatch observations for LHP-LLD_SWO than what was planned. With the inflation and rise in fuel prices fishermen tend to prolong their stay on sea over several days and the size of the vessels being under 15m does not provide conditions for a scientific observer to board. To be able to acquire required bycatch data questionnaires are presented to the fishermen during the whole of their fishing season. This requires acclimatisation of fishermen and a certain degree of trust with the scientific observers which is a slow process that is in progress.

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.

For the next year the fishermen are going to be more accustomed to PETS bycatch observations and providing information for the questionnaires, while further work is going to be put in this from the scientific observer side to increase the number of sampled fishing trips, so the planned bycatch sampling quota is met.

Text Box 4.3: Fisheries impact on marine habitats

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

Name of the study: Study on the impact of beach seines on Posidonia meadows

1. Aim of the study

Beach seines are active fishing gear that operate in extremely sensitive coastal areas where there are also sensitive habitats of *Posidonia oceanica* meadows which are known as nursery grounds and spawning area for many coastal species. *Posidonia* habitat is classified as priority habitat according to the Habitats Directive (annex 1) (Council Directive 92/43/EEC), Marine Strategy Framework Directive - MSFD (Directive 2008/56/EC) and Common Fisheries Policy (Regulation (EU) No 1380/2013) and is protected under international conventions (RAMSAR convention, Berne convention (annex 1) and Barcelona convention (annex 2)). The aim of the study is to describe the impact of beach seine on *Posidonia* meadow habitats and on coastal ichthyo populations.

2. Duration of the study

Sampling is planned to be carried out in the colder part of the year, when this gear is allowed for use, from winter 2022 until spring 2023.

3. Methodology and expected outcomes of the study

Sampling is planned to be carried out at 5 different locations along the Adriatic coast. At each location, sampling is planned 3 times for a minimum of three hauls.

During the data collection, an analysis of the qualitative and quantitative composition of the catch, as well as the population structure of the target species will be performed. Also, during fishing operations, the work of the net and the impact on *Posidonia* and habitat will be recorded using scuba divers and cameras.

In this way, it will be possible to describe the composition of beach seine catches and gear's impact on *Posidonia* meadows and coastal benthic habitats and ichthyo populations.

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

For this study sampling was conducted in 4 different areas in the past period: Island of Vis, Island of Šolta, Island of Drvenik Veliki and in the area of Rogoznica and Primošten, totalling 10 field surveys. The southern part of the Adriatic Sea was not included in the survey, as fishing with beach seines in this area was stopped in 2022 and there are no more allowed areas to work in, the so called "green points". Three hauls per field were

conducted in each area and the qualitative and quantitative composition of the catch was analysed. This study is ongoing and is expected to be completed by the end of June 2023, according to WP 2023.

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

Not applicable, study is continuing in 2023, according to adopted WP 2023.

Follow-up to the activities (what are the next steps, how the results will be used).

Not applicable.

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

Name of the study: Monitoring of marine protected areas, special habitats and areas with special fishing regulations

1. Aim of the study

The study will assess the state of littoral ichthyo communities in marine areas under special regulation of fishing activities as prescribed by the Regulation of fishing in protected areas, special habitats and areas with special fishing regulations (Official Gazette of the Republic of Croatia 125/2020).

2. Duration of the study

Field sampling for the study is planned from 1st of May to 31st of October 2022, and data processing until the end of 2022. After this baseline assessment, it is planned to turn the research into a permanent monitoring starting from 2023.

3. Methodology and expected outcomes of the study

Using the non-destructive underwater visual census techniques (e.g. SCUBA diving along transect lines) this research will analyse the biological responses of fish to different levels of protection by comparing the composition, abundance and structure of coastal ichthyofauna, as well as the population structure of dominant commercially exploited fish species between the selected protected marine areas and their nearby ecologically similar areas that are not protected.

Based on the data collected in the initial study, the impact of conservation measures on the recovery of coastal fish communities will be evaluated, while the establishment of an ongoing monitoring program will provide insight into long-term temporal and spatial changes in coastal fish communities and the effectiveness of marine protected areas.

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

Funding of this activity was planned from the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) given that Croatia used up all allocated EMFF funds for data collection for the period 2014-2020.

In the course of 2022, informal consultation with the Commission was initiated on the adoption of the Partnership Agreement 2021-2027 with Croatia, and during this period the documentation for the initiation of the public procurement procedure was also prepared.

Given there were some delays in the consultation process for the Partnership Agreement 2021-2027 with Croatia, and consequently the Croatian EMFAF Programme, the Programme was informally agreed, including DCF financing, and officially adopted in the end of November 2022.

Following internal MA-DoF procedures, the study underwent a public procurement process in early 2023, after

which the contract was signed with the service provider in late May 2023. Due to these circumstances, all planned activities have been adjusted as described below. Croatia will amend the Work Plan for 2024 in line with these changes.

Expected duration of the study was adapted to 26 months, 24-month period for the implementation of activities and an extra two months for reporting of final results.

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

Not applicable.

Follow-up to the activities (what are the next steps, how the results will be used).

Not applicable.

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

**Name of the study: Monitoring of fisheries impact on the Fishery Restricted Area (FRA)
Jabuka/Pomo Pit**

1. Aim of the study

Fisheries restricted area (FRA) in Jabuka Pit area has been established by GFCM in 2017 (Recommendation GFCM/41/2017/3 on the establishment of a fisheries restricted area in the Jabuka/Pomo Pit in the Adriatic Sea), and by GFCM decision FRA became an integral part of the MAP for trawling in the Adriatic Sea (Recommendation GFCM/43/2019/5 on a multiannual management plan for sustainable demersal fisheries in the Adriatic Sea (geographical sub areas 17 and 18). This decree completely prohibits demersal fishing in the central part of the FRA Jabuka, and two buffer zones in which trawl fishing can be performed only two days a week. In the buffer zones, fishing with set nets and longlines is also allowed (again two days per week).

The aim of this research is to describe the effects of the establishment of FRA on renewable resources and marine ecosystems.

2. Duration of the study

01/01/2022 – 31/12/2024

3. Methodology and expected outcomes of the study

Field sampling is planned to be carried out twice a year in order to take into account the seasonal aspect of the state of renewable resources and marine ecosystems. Field sampling is planned during the summer period for 5 working days, and sampling in the winter period for 7 working days (due to the shortness of the day). The summer aspect would be performed during early summer period (June-July), and the late winter period (during February – March) at 10 stations located in different parts of the FRA and the surrounding sea. Sampling would be performed using a scientific research vessel and the methodology prescribed for MEDITS survey (fishing gear, sampling methodology, on board analysis, laboratory analysis, etc.).

The collected data would be jointly analysed with complementary data collected by Italian researchers with the aim of obtaining a complete picture of the state of resources and marine ecosystems in the central Adriatic, as well as the effects of the establishment of FRA Jabuka.

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

Monitoring of the state of biological resources in accordance with GFCM Recommendations is carried out twice a year to consider the seasonal aspect of the state of renewable resources and marine ecosystems. Monitoring is conducted by the Institute of Oceanography and Fisheries of Split, Croatia, and the Marine

Biology and Fisheries Laboratory of Fano, Italy following the MEDITS sampling protocol.

The results include data from 2000–2022 in the spring-summer period, and from 2019–2022 in the winter period.

From the Italian side, the 2022 survey has not been conducted, in both summer and winter period, therefore this data is missing from the analysis.

The data analysis has been done for determined zones that differ considering the level of protection and fishing effort, in order to better explain the impact of protection level on the recovery of biological resources.

The results of this study indicate an increase in total biomass in the investigated area. Furthermore, the increase in biomass is evident for all fish species, selachian species, and crustaceans, as for commercially most important species. A decline in biomass index was observed only for cephalopod species.

The increase in biomass is most evident in the NO – TAKE zone, as is in the eastern (Croatian) part of the Pit declining towards the western (Italian) part. This is in accordance with the degree of protection and the fishing effort that the resources are exposed to.

For European hake (*Merluccius merluccius*) the positive effect of the closure is evident, a certain decline inside the NO – TAKE zone was observed after an initial distinct increase. Simultaneous increase is evident in adjacent zones from the Croatian side which can be explained by a spillover of the population from the NO - TAKE zone to the surrounding waters.

For Deep rose shrimp (*Parapenaeus longirostris*) a strong positive influence of the closure of the Jabuka/Pomo Pit area can be also observed. The most significant increase occurred in the NO–TAKE zone and in Croatian territorial waters.

In the case of the Norwegian lobster (*Nephrops norvegicus*), the positive effect of the closure is the most significant of all analysed species. Biomass indices rose from extremely low values in 2014 followed by a constant rise, especially in the NO – TAKE zone, to the end of the investigated period in 2022.

A significant increase in biomass is also observed for selachian species, especially in the NO – TAKE zone and in the Croatian part of the pits.

It is in general safe to say that the positive effects of fishery closure, especially for the key species, are most evident in the NO – TAKE zone. Also, positive increases in biomass are evident in the Croatian “buffer” zone and in Croatian territorial waters, making the spillover effect from closed area to adjacent waters evident.

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

Field sampling in the scope of this study in 2022 has been carried out as planned in the winter period from 14/02/2022 to 18/02/2022 on 18 stations following the random stratified survey design, as well as in the spring-summer period within the annual MEDITS survey.

All the expected outcomes were achieved.

Follow-up to the activities (what are the next steps, how the results will be used).

The positive results show the justification for the establishment of the FRA, and we are of the opinion that it is an appropriate mechanism for the protection and restoration of resources, and that the example of FRA Jabuka can serve as a template for the establishment of similar measures in other areas of the Adriatic, namely Solea sanctuary and FRA area in the deep south Adriatic.

It is of the utmost importance to continue the protection regime in the Jabuka Pit, and the monitoring of the state of resources as prescribed by the GFCM Recommendations. Alongside the winter and summer monitoring of the state of resources, monitoring of fishing effort, preferably via VMS data, considering that all vessels fishing in the Jabuka pit area are obliged to be equipped with VMS. In this way, it would be made possible to also describe the changes in the fishing effort and the redistribution of the effort as an aftereffect of FRA establishment.

Results were presented by IOF at the GFCM Subregional Committee for the Adriatic Sea (SRC-AS) in May 2023.

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

Name of the study: Additional sampling of incidental catch of vulnerable species

1. Aim of the study

The aim of the research is to collect additional information on bycatch of protected sea birds, marine mammals, marine reptiles, elasmobranchs and microbenthic invertebrates through dedicated sampling activities on the key fishing gears, to assess the main areas for vulnerable species and perform a risk assessment of the impact of fishing gears on specific groups of PETS. This activity is complementary to scientific monitoring of commercial fisheries performed according to WP Sections 2.4, 2.5 and 4.2.

2. Duration of the study

01/01/2022 – 31/12/2024

3. Methodology and expected outcomes of the study

Gathering additional information on bycatch on key fishing gears will be done by dedicated scientific PETS bycatch observers (1) on board fishing vessels, (2) at landing sites and (3) by experimental remote electronic monitoring (REM).

1) PETS bycatch observers on board fishing vessels:

Additional on-board sampling with the aim to collect additional data on incidental catch of vulnerable species will be performed by a dedicated scientific PETS bycatch observers on board fishing vessels. Sampling will cover in total 54 fishing trips annually for the following fishing gears: bottom trawl 36 trips, dredge 6 trips and purse seine for small pelagic fish 12 trips per year.

2) PETS bycatch observers at landing sites:

For vessels less than 15 meters, additional bycatch of vulnerable species information will be collected through survey questionnaires and interviews with fishermen at landing sites. Fishermen will be asked to make the photos of bycatch so that the determination of vulnerable species can be more precise. It is planned to collect in total 525 questionnaires. Following number of trips per year will be covered by questionnaires and interviews: for bottom trawl 60 trips; purse seine for small pelagic fish 60 trips, bottom longlines 40 trips, pelagic drifting longlines and handline and pole for BFT 55 trips, pelagic drifting longlines and handline and pole for SWO 40 trips, fixed nets GNS 150 trips; fixed net GTR 100 trips and dredges DRB 20 trips.

3) Experimental remote electronic monitoring (REM):

It is also planned to collect data by experimentally installing cameras on commercial fishing vessels to monitor incidental catch of vulnerable species, to be operated by fishermen with the aim to record the process of finishing fishing activities (beginning with the start of hauling operation on the vessel). During the first implementation year test sampling with camera will be conducted on demersal trawl vessels for the 80 trips per year. Records will be downloaded monthly by IOF observers. After the analysis of effectiveness of this type of data collection a methodological approach for other high-risk gears will be considered in the following implementation period. WP will be amended accordingly.

Expected outcomes

Results of this sampling activity will serve to increase bycatch observation effort and enable more precise estimate of incidental catch of PETS in commercial/recreational fisheries which is carried out according to WP Sections 2.4, 2.5 and 4.2.

Complete overview of PETS bycatch observation effort is provided in Section 4.2 (Table 2).

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

Results are not available at the time of the submission of AR 2022 on 31 May 2023. Expected data availability is June 30th 2023 in line with planned activities (Table 1.1).

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

Activities were achieved as planned.

Follow-up to the activities (what are the next steps, how the results will be used).

Continuation of activities is planned according to WP 2023/2024.

Results of the study will be published online, and communicated to the environmental authorities, relevant NGOs, and sector.

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

Name of the study: Stomach content analysis of large pelagic species combining morphological and metagenomic approach

1. Aim of the study

Atlantic Bluefin tuna (*Thunnus thynnus*) and swordfish (*Xiphias gladius*) are important targeted species for commercial and recreational fisheries as it is specified in EU MAP implementation decision 2021/1167. Impact of fishing activities on these top predators requests the need for a better knowledge of the food webs which these populations are a part of at different stages of their life cycle. Stomach sampling and analysis, as noted in the Chapter 2 of the Annex of EU MAP 2021/1167 provides us with insight in fish diet and feeding habits that form the basis for understanding trophic interactions in aquatic food webs and represent an integration of many important ecological components. Nevertheless, studies on the feeding ecology of tuna and swordfish in the eastern Adriatic are scarce, i.e. in an area known as a feeding ground for juvenile fish. The research based exclusively on macroscopic analysis of stomach contents of adult tuna in central Adriatic generally confirms the opportunistic behaviour. However, morphological identification of prey has limitations. It requires special skills and experience and, more importantly, may be limited by the differential digestion of prey, with species composed of soft tissues often being missed. In contrast, DNA metabarcoding allows for a relatively simple and rapid inventory of prey, but is more suitable for a qualitative inventory approach as the exact abundance of prey consumed cannot be accurately inferred due to the high PCR bias affecting the number of sequences obtained for each detected target. Therefore, a complementary approach is recommended to meet the research interest.

In the present study, three main objectives are pursued: (1) to develop a reliable DNA metabarcoding protocol for the analysis of tuna and swordfish stomach contents with recurrent traits, to quantify (2) relative diet composition and (3) prey selectivity based on presence-absence inventories and associated metrics, taking into account seasonal and ontogenetic preferences of the fish.

2. Duration of the study

Three years are planned for the current study duration, beginning on 01/01/2022 and ending on 31/12/2024. Study is divided into three phases which correspond to implementation years of the WP. In the first year, the planned activities will be fish and stomach sampling, preservation of stomachs, procurement of equipment and chemicals and DNA-based dietary analysis. DNA isolation and optimization of the protocol for amplification

of two barcoding gene regions will be performed, followed by Illumina MiSeq sequencing. Second year will continue fish sampling with molecular analysis. In the third year, a bioinformatics pipeline will be established to enable robust analysis of datasets. This will allow further statistical analysis to provide a list of prey taxa, their biodiversity and relative abundance. Together with a comparative analysis with morphological data, the final report will be presented by 30th June 2025.

3. Methodology and expected outcomes of the study

Fish sampling. It is planned to conduct at least 24 successful stomach content analyses per species during the test study, combining morphological and metabarcoding approaches. Fish stomachs will be sampled over two years (in 2023 and 2024) from commercial fishing trips (as specified in Table 2.5 for ICCAT), as seasonal and ontogenetic diet variability will also be assessed. Samples will be collected in the eastern regions of the Adriatic Sea during monitoring of commercial fishing. After catching the fish, the stomach will be sampled and placed on ice to preserve the contents and maintain high DNA quality. Metadata on each specimen, including year, sex, weight, and length, will be recorded in line with the protocol for sampling of commercial fishery.

Stomach content analysis. In the laboratory, morphological identification of prey to the lowest possible taxonomic rank will be conducted on dissected stomach contents, following the DNA extraction from a few grams of homogenised contents. In addition to mechanical maceration, extraction will be performed in a lysis step using proteinase K and a commercial kit for DNA extraction. PCR will be performed separately for the two barcoding gene regions COI (Metazoa) and 18S-V1V2 (Metazoa). All PCR products will be analysed for quality and quantity by gel electrophoresis and fluorometer. Sequencing and library preparation will be performed by a commercial service provider using the Illumina MiSeq instrument to obtain 300 bp paired-end sequences.

Bioinformatics. Bioinformatic pipeline will include FASTQ files trimming to remove all primers and leftover adapters. The total length of 250-350 base pairs (bp) for COI and 300-500 bp for 18S-V1V2 assembled fragments is expected. The output as the list of unique sequences referred to as amplicon sequence variants (ASVs), along with the number of reads will be encountered. Taxonomic assignment will be performed at the ASV level using reference databases. Statistics will include analysis of presence-absence of OTUs, including the assessment of the percentage of occurrence and the weighted percentage of occurrence of prey taxa, both with a minimum 1% occurrence threshold. Second, to test the accuracy of the semi-quantitative information that the number of reads could deliver, relative read abundance information will be estimated for each prey item.

The expected outcomes are divided into the 3-year period of the project:

(1) First year activities: Fish and stomach sampling, morphological analysis of the prey, procurement of chemicals and equipment, DNA isolation and amplification of barcoding genes, test sequencing. Expected outcomes: Stomach sampling protocol, molecular laboratory establishment, quality DNA checklist.

(2) Second year activities: Fish and stomach sampling, morphological analysis of the prey, procurement of chemicals, DNA isolation and amplification of barcoding genes, sequencing by commercial service. Expected outputs: Composition of stomach content based on morphological characteristics, amplification protocol for barcoding genes, raw sequences data.

(3) Third year activities: Bioinformatics and statistical analysis of sequences obtained per gene and per fish, statistics of morphologically identified prey. Expected outputs: Bioinformatics pipeline, report with relative food composition and prey selectivity based on presence-absence inventory and associated metrics with seasonal and ontogenetic diet fish preferences.

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

Funding of this activity was planned from the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) given that Croatia used up all allocated EMFF funds for data collection for the period 2014-2020.

In the course of 2022, informal consultation with the Commission was initiated on the adoption of the Partnership Agreement 2021-2027 with Croatia, and during this period the documentation for the initiation of the public procurement procedure was also prepared.

Given there were some delays in the consultation process for the Partnership Agreement 2021-2027 with Croatia, and consequently the Croatian EMFAF Programme, the Programme was informally agreed, including DCF financing, and officially adopted in the end of November 2022.

Following internal MA-DoF procedures, the study underwent a public procurement process in early 2023, after which the contract was signed with the service provider in late May 2023. Due to these circumstances, all planned activities have been adjusted as described below. Croatia will amend the Work Plan for 2024 in line with these changes.

Expected duration of the study was adapted to 26 months, 24-month period for the implementation of activities and an extra two months for reporting of final results.

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

Not applicable.

Follow-up to the activities (what are the next steps, how the results will be used).

Not applicable.

SECTION 5: ECONOMIC AND SOCIAL DATA IN FISHERIES

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

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

1. Description of clustering

Croatia applies a dynamic fleet segmentation and clustering scheme. Fleet segmentation is done at the beginning of each reporting year for the previous (referent) year by statistically analysing fishing activity data obtained from logbooks and fishing reports.

Based on capacity data on the population and data on the use of fishing gears retrieved and stored, after data has been validated and verified, a segmentation of the fishing fleet is performed. In some cases fleet segments are clustered for sampling purposes or reporting purposes for confidentiality reasons. As fleet segmentation depends entirely on the activity of vessels, in cases where clustering is needed, vessel activity is reviewed on a vessel to vessel case. In cases where a vessel changes its activity from one year to another inconsistently, it is directly reflected in the clustering.

On the basis of determined fleet segments, the procedure for determining sample sizes is carried out. In order to estimate the sample size for the collection of economic variables, the variability of GT and kW is calculated. Coefficient of GT variation is used as a basis to define the sample size of the total fleet.

The sample is distributed among the relevant strata with the principal objective of minimizing the sampling

error to be obtained for the stratification variable. The optimum Neyman allocation, which guarantees a minimum variance for the variable used in the stratification, is used for this purpose.

The sample size for each stratum is adjusted in accordance with several minimum rules: not less than 10% of each stratum, not less than 5 observations per segment with <50 active vessels assuming the response rate of 50%. Finally, stratification on the basis of representative sub-sample per coastal county is made which results in a somewhat higher sample rate overall. This has to be done in order to try to reach a representative sample size for each coastal county for two reasons: 1) efficiently organize sampling among data collectors in seven DoF field units and 2) enable economic analysis at the level of smaller units for the purposes of evaluating FLAG strategies, different development plans at municipal level etc.

The Croatian fishing fleet has a range of vessel types using various gears and targeting different species exclusively in FAO area 37.2.1. (Adriatic), in the GFCM-GSA 17 (Northern Adriatic Sea). The fleet consists of 23 (DCF) active fleet segments, which are divided into 10 small-scale coastal fleet (SSCF) segments (DFN, FPO, HOK, PGP and PMP) and 13 large-scale fleet (LSF) segments (DFNVL1218, DRB, DTS, MGO and PS), and 5 inactive length classes, according to DCF methodology.

Information on clustered fleet segments (based on referent year 2020):

- *Demersal trawlers and/or demersal seiners 6-< 12 m** (142 vessels) is clustered with *Demersal trawlers and/or demersal seiners 0-< 6 m* (5 vessels);
- *Dredgers 12-< 18 m** (14 vessels) is clustered with *Dredgers 24-< 40 m* (1 vessel);
- *Vessel using other active gears 6-< 12 m** (55 vessels) is clustered with *Vessel using other active gears 12-< 18 m* (2 vessels);
- *Vessels using active and passive gears 6-< 12 m** (27 vessels) is clustered with *Vessels using active and passive gears 12-< 18 m* (3 vessels);
- *Vessels using hooks 6-< 12 m** (254 vessels) is clustered with *Vessels using hooks 6-< 12 m* (7 vessels); and
- *Vessels using Polyvalent “passive” gears only 6-< 12 m** (821 vessels) is clustered with *Vessels using Polyvalent “passive” gears only 12-< 18 m* (1 vessel).

Clustering is performed in cases where a fleet segment has less than 10 vessels and it is necessary in order to design the sampling plan and to report economic variables. Clustering is done entirely on the basis of similarity to other segments (either clustering by adjacent vessel length category or by assessing fishing activity on a case by case basis in terms of landings (value and volume) and/or effort).

2. Description of activity indicator

If the MS is using activity indicator for dividing the fleet segment into different activity levels, use “L” for the low activity vessels and “A” for the normal economic activity vessels please provide description of activity methodology used.

Not applicable.

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

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

Not applicable.

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

- No deviations.

Actions to avoid deviations

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

applicable.

- Not applicable.

SECTION 6: ECONOMIC AND SOCIAL DATA IN AQUACULTURE

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

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

1. Description of the threshold application

Please provide % of the MS production from the latest EU aquaculture production reported to the EUROSTAT. Describe and justify the applied threshold(s).

According to available Eurostat aquaculture production data, Croatian aquaculture production, with 20,4 thousand tonnes in 2019 represents a share of 1,83% of the total EU-28 production from aquaculture (excluding hatcheries and nurseries).

Croatia is not applying a threshold on data collection. Data collection is planned in the period 2022-2024.

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

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

Not applicable.

Deviations from the work plan

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

- No deviations.

Actions to avoid deviations

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

- Not applicable.

SECTION 7: ECONOMIC AND SOCIAL DATA IN FISH PROCESSING

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

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

This text box is optional, since all information on the sampling schemes is available in Annex 1.2 document template. MS is invited to highlight additional information here on sampling schemes and sampling frames deemed necessary to understand the actual sampling design planned for the region and the implementation year(s).

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

Data collection is planned to be carried out following the same approach as in previous years. Detailed data on processing industry is needed in Croatia as additional data is required for the calculation of various indices for measures targeting the fishing processing industry which are planned in the framework of Programme for fisheries and aquaculture of the Republic of Croatia for the programming period 2021-2027 according to EMFAF.

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

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

Not applicable.

Deviations from the work plan

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

- No deviations.

Actions to avoid deviations

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

- Not applicable.

ANNEXES - QUALITY REPORTS

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: Scientific monitoring of European eel in freshwater)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: Scientific monitoring of European eel in freshwater
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2024
<p>Short description: Scientific monitoring of European eel (<i>Anguilla anguilla</i>) in inland waters (Table 2.3, Text Box 2.3), conducted by independent research institutes contracted by MA-DoF. All biological data (length, weight, age, sex etc.) for eels will be collected from sampling in inland water bodies annually. Sampling will be performed by fyke nets, electrofishing and other appropriate methods.</p>
Description of the population
<p>Population targeted: Sampling will be carried out annually at random locations in each area.</p> <p>Population sampled: Yellow and silver eel.</p> <p>Stratification: Fishing area under jurisdiction of the Republic of Croatia is divided into several zones. Each zone has its own specific geomorphological characteristics and environmental conditions differ from one zone to another: river areas Drava-Dunav, Sava, Kupa, Lika and Jadran.</p>
Sampling design and protocols
<p>Sampling design description: Sampling design will be provided after first year of implementation.</p> <p>Is the sampling design compliant with the 4S principle?: NA.</p> <p>Regional coordination: ISSG Diadromous, RCG MED & BS; GFCM WGs</p> <p>Link to sampling design documentation: Sampling design will be provided after first year of implementation.</p> <p>Compliance with international recommendations: Y</p>

<p>Link to sampling protocol documentation: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf</p>
<p>Compliance with international recommendations: Yes.</p>
<p>Sampling implementation</p>
<p>Recording of refusal rate: Y</p>
<p>Monitoring of sampling progress within the sampling year: The progress will be monitored by means of expert consilium from MA-DoF and research institutes conducting the monitoring.</p>
<p>Data capture</p>
<p>Means of data capture: Information will be provided after first year of implementation.</p>
<p>Data capture documentation: Documentation will be provided after first year of implementation.</p>
<p>Quality checks documentation: NA</p>
<p>Data storage</p>
<p>National database: MA-DoF database (FIS)</p>
<p>International database: JRC&GFCM</p>
<p>Quality checks and data validation documentation: NA</p>
<p>Sample storage</p>
<p>Storage description: Information will be provided after first year of implementation.</p>
<p>Sample analysis: Information will be provided after first year of implementation.</p>
<p>Data processing</p>
<p>Evaluation of data accuracy (bias and precision): N No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the Regional sampling plan during 2022.</p>
<p>Editing and imputation methods: 'Y' Web based application</p>
<p>Quality document associated to a dataset: N</p>
<p>Validation of the final dataset: Datasets are validated by scientific consilium on the national and international level (STECF EWGs&GFCM WG, SCRS).</p>
<p>AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.</p> <p>There are no deviations from planned methodology.</p>

(Sampling scheme identifier: Scientific monitoring of recreational fisheries / HRV REC FISH Survey)

MS: Croatia

Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: HRV REC FISH Survey
Sampling scheme type: Recreational fisheries
Observation type: EMAtSea; SelfAtSea
Time period of validity: 2022-2024
Short description: HRV REC FISH Survey is a national annual survey concerning recreational and sports fisheries in Croatia for species listed in Table 2.4. Data collection is based on self-sampling (log-book/questionnaires).
Description of the population
<p>Population targeted: Targeted population consists of users of licenses for recreational and sport fishery in the Republic of Croatia. Approximately 80 000 licenses are issued yearly for this type of fishery. This includes both annual and daily, weekly and monthly licenses as well as special licenses for certain gears. The database of licence holders is curated by DoF.</p> <p>Population sampled: Official database of license holders will be used for the random draw of fishers which will be asked to participate in the survey (400 fishers). Non-respondents will be recorded.</p> <p>Stratification: Fishing area under jurisdiction of the Republic of Croatia is divided into several fishing zones. Each zone has its own specific oceanographic and geomorphological characteristics and environmental conditions differ from one zone to another. Licensing system seeks from the user to state the fishing zone utilized for the fishing operations. This information will be used to stratify the sampling according to fishing zones.</p>
Sampling design and protocols
<p>Sampling design description: Sampling will be implemented according to recommendations provided in Grati et al. (2021). Off-site survey is envisaged by the means of the log-book. Fishers will be asked to fulfil log-books/questionnaires after each fishing operation or monthly/yearly by recall. A combination of log-book and recall survey will be implemented depending on the availability and willingness of fishermen. Sampling will be of probabilistic type, meaning that the participants will be selected by random draw from the database of licence holders. Sampling size will be calculated according to recommendations by Grati et al. (2021).</p> <p>Is the sampling design compliant with the 4S principle?: NA.</p> <p>Regional coordination: RCG MED & BS; RCG LP, GFCM WGs; FAO AdriaMed WGs</p> <p>Link to sampling design documentation: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf https://podaci.ribarstvo.hr/files/Protokoli-za-priklupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf</p> <p>Compliance with international recommendations: Yes. Agreed sampling protocol according to RCG Med&BS 2021 Recommendation 7 (Agreement on methodologies for data collection in recreational fisheries):</p> <p>Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No 669. Rome, FAO: https://www.fao.org/gfcm/publications/series/technical-paper/669/en/</p>

<p>Link to sampling protocol documentation: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf</p>
<p>Compliance with international recommendations: Yes.</p>
<p>Sampling implementation</p>
<p>Recording of refusal rate: Y</p>
<p>Monitoring of sampling progress within the sampling year: The progress will be monitored by means of expert consilium from IOF, MA-DoF and CSSFA.</p>
<p>Data capture</p>
<p>Means of data capture: Log books, questionnaires, scales, measuring board, etc.</p>
<p>Data capture documentation: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf</p>
<p>Quality checks documentation: https://podaci.ribarstvo.hr/prikupljanje-podataka/bioloski/</p>
<p>Data storage</p>
<p>National database: IOF database https://vrtlac.izor.hr/ords/riba</p>
<p>International database: JRC&GFCM</p>
<p>Quality checks and data validation documentation: Internal database documentation, access is granted only to project partners (IOF and DoF) with authorized credentials: https://vrtlac.izor.hr/ords/riba/DCF_DOKUMENTACIJA.</p>
<p>Sample storage</p>
<p>Storage description: Age structures (spine segments) are stored in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.</p>
<p>Sample analysis: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf</p>
<p>Data processing</p>
<p>Evaluation of data accuracy (bias and precision): N No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the Regional sampling plan during 2022.</p>
<p>Editing and imputation methods: 'Y' Web based application</p>
<p>Quality document associated to a dataset: N</p>
<p>Validation of the final dataset: Datasets are validated by scientific consilium on the national and international</p>

level (STECF EWGs & GFCM WG, SCRS).

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

There are no deviations from planned methodology.

(Sampling scheme identifier: Scientific monitoring of recreational fisheries / BFT BGF REC)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: BFT BGF REC
Sampling scheme type: Recreational fisheries
Observation type: SciObsOnShore
Time period of validity: 2022-2024
Short description: BFT BGF REC is sampling scheme code for Bluefin tuna quota competitions (BFT BGF REC) competitions (Table 2.4).
Description of the population
Population targeted: Big game fishing competitions with BFT quota. Around 10 BGF competitions are held annually, it is planned to sample during each BGF competition.
Population sampled: Every declared catch from all participants of each BGF competition will be sampled.
Stratification: No stratification.
Sampling design and protocols
Sampling design description: During the implementation of the project activities within monitoring of biological variables (in BGF competitions), the sampling design and protocols of the activities follow the outcomes of expert groups (RCG MED & BS; RCG LP) and existing common standard criteria are used (Age determination protocols).
Is the sampling design compliant with the 4S principle?: NA.
Regional coordination: RCG MED & BS; RCG LP, GFCM WGs; FAO AdriaMed WGs
Link to sampling design documentation: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf https://podaci.ribarstvo.hr/files/Protokoli-za-priklupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf
Compliance with international recommendations: Yes. Agreed sampling protocol according to RCG Med&BS 2021 Recommendation 7 (Agreement on methodologies for data collection in recreational fisheries):
Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea. FAO Fisheries and Aquaculture Technical Paper No 669. Rome, FAO:

<https://www.fao.org/gfcm/publications/series/technical-paper/669/en/>

Link to sampling protocol documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

Compliance with international recommendations: Yes.

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: The progress will be monitored by means of expert consilium from IOF, MA-DoF and CSSFA.

Data capture

Means of data capture: Log books, questionnaires, scales, measuring board, etc.

Data capture documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

Quality checks documentation:

<https://podaci.ribarstvo.hr/prikupljanje-podataka/bioloski/>

Data storage

National database: IOF database <https://vrtlac.izor.hr/ords/riba>

International database: JRC&GFCM

Quality checks and data validation documentation:

Internal database documentation, access is granted only to project partners (IOF and DoF) with authorized credentials:

https://vrtlac.izor.hr/ords/riba/DCF_DOKUMENTACIJA.

Sample storage

Storage description: Age structures (spine segments) are stored in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.

Sample analysis:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf

Data processing

Evaluation of data accuracy (bias and precision): N

No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the Regional sampling plan during 2022.

Editing and imputation methods: 'Y'

Web based application

Quality document associated to a dataset: N
Validation of the final dataset: Datasets are validated by scientific consilium on the national and international level (STECF EWGs & GFCM WG, SCRS).
AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.
There are no deviations from planned methodology.

(Sampling scheme identifier: Scientific monitoring of commercial fisheries / Sci Obs Shore Commerc Sel Stock)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: Sci Obs Shore Commerc Sel Stock
Sampling scheme type: Commercial fishing
Observation type: SciObsOnShore
Time period of validity: 2022-2024
Short description: Sci Obs Shore Commerc Sel Stock is sampling scheme code for all of the sampling frames (metiers) specified in Table 2.5 that relate on data sampling by scientific observers on shore.
Description of the population
<p>Population targeted:</p> <p>Official statistics (catch, discards, landings, effort and value data) have been used to apply the ranking system. Sampling strategy for each metier is designed partly as concurrency-at-sea (sampling directly on board by observers and scientists) and concurrency-at-landing site (sampling directly on landing site, at market etc.), taking also into account the Croatian fishing zones and their specificities. Vessel list is established according to list authorisations issued by gear type in accordance with relevant national management plans (demersal trawl, purse seine nets and seine nets), authorisations issued by vessel/gear type according to individual quota allocation (purse seine net for Bluefin tuna and swordfish hook and line vessels and longline vessels), authorisations issued by vessel/gear type in fisheries restricted area (FRA) and other authorizations.</p> <p>Population sampled:</p> <p>The target population for the reference year will be the number of fishing trips (fishing days) by metier (sampling frame) of the previous years. The frame population is a subsample of the target population: it will be a selection of fishing trips, mainly on spatial (Croatian fishing zones and subzones) and time stratification basis (monthly, quarterly or seasonally) with measurements of the composition of the catch in order to detect seasonal differences in the demographic structure and composition of the landings for different metiers.</p> <p>The sampling will be accomplished as stratified random sampling: the sampling unit belonging to the metier (primary unit) will be the fishing trip (secondary unit). The number of fishing days to be sampled has been defined proportionally to the effort (number of days at sea for each metier) and the landings.</p> <p>For demersal trawl and purse seine nets the entire population of vessels is not available for sampling in certain periods of the year due to periods of temporary cessation of fishing activities and spatio-temporal closures implemented on a national level in accordance with management plans. Sampling plan design takes into account mentioned restrictions.</p> <p>Stratification: Fishing area under jurisdiction of the Republic of Croatia is divided into several fishing zones. Each zone has its own specific oceanographic and geomorphological characteristics and environmental conditions differ from one zone to another. Selected species for monitoring are not equally distributed across the Adriatic Sea due to its biological and ecological characteristics. For some species there is strong variation in distribution between seasons due to migrations patterns, recruitment, spawning etc. Sampling scheme is designed to cover quarterly all fishing zones in Croatia in order to achieve representative length frequency</p>

distribution and to cover different life stages as well. Croatian fishing vessels operate exclusively in the Northern Adriatic Sea (GSA 17).

Sampling design and protocols

Sampling design description: During the implementation of the project activities within monitoring of biological variables, the sampling design and protocols of the activities follow the outcomes of sampling expert groups (RCG MED & BS; RCG LP, GFCM WGs; FAO AdriaMed WGs, ICCAT) and existing common standard criteria are used (MEDITS and MEDIAS scientific surveys sampling protocols; Age determination protocols, etc.).

Sampling at landing sites is performed in order to determine the composition of the catch of the target species, and is carried out according to the National Plan at the landing sites / fishing zones in which they are determined, as well as the dynamics of sampling at landing sites. Scientific observers (in agreement with the authorized person) go to each individual landing site and take a representative sample of the target species landed that day at that landing site. Depending on the technical capabilities at the landing site, scientific observers measure the length and weight structure of the target species or, if this is not feasible, this part of the representative sample is transported to IOF in Split for analysis in the Laboratory. At the landing site, observers record the total catch of one fishing trip of at least one vessel per metier. The length structure of the target species is then measured. Ideally, the SO measures all individuals of the target species, or a representative sample is taken according to the commercial categories for each species. The number of individuals to be sampled must ensure well defined length distribution.

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

Regional coordination: RCG MED & BS; RCG LP, GFCM WGs; FAO AdriaMed WGs

Link to sampling design documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

Compliance with international recommendations: Yes.

Link to sampling protocol documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

Compliance with international recommendations: Yes.

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: Sampling plan is constantly monitored using online applications in which information of sampling trips are inputted in real time.

Sampling plan is adjusted in case of deviations.

Data capture

Means of data capture: Fishing gear, scales, measuring board, etc.

Data capture documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

<p>Quality checks documentation: https://podaci.ribarstvo.hr/prikupljanje-podataka/bioloski/</p>
<p>Data storage</p>
<p>National database: IOF database https://vrtlac.izor.hr/ords/riba</p> <p>International database: JRC&GFCM</p> <p>Quality checks and data validation documentation: Internal database documentation, access is granted only to project partners (IOF and DoF) with authorized credentials: https://vrtlac.izor.hr/ords/riba/DCF_DOKUMENTACIJA.</p> <p>The biological data collected during the sampling activities of the commercial catches and the discards was archived and validated using different data entry and processing programs which are constantly being updated and are suited for each métier and stock. Data with limited values are inserted using drop down list with predefined values (métier, type of sampling, species, etc.). Times and dates data are inserted using time picker insuring the same format. Numeric data are checked for value range if such is specified (coordinates, weight, etc.). In cases of errors in data entries, data will not be committed and will be marked with red notice and cannot be uploaded until the error is corrected. Visual check of graphic data representation is also available during data entry.</p> <p>Automatic checks are in line with possible missing data and/or eventual errors regarding calculations. Operator managing database applications, before the final validation, can use graphic representation of data sets for easier notice of out of range data.</p> <p>Improvements in sampling procedures and data analysis were implemented starting from 2020 according to the results of the European project MARE / 2016/22 STREAM “Strengthening Regional cooperation in the area of fisheries biological data collection in the Mediterranean and Black Sea”.</p>
<p>Sample storage</p> <p>Storage description: Age structures (otoliths and spine segments) are stored in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.</p> <p>Sample analysis: https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf</p>
<p>Data processing</p> <p>Evaluation of data accuracy (bias and precision): N No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the Regional sampling plan during 2022.</p> <p>Editing and imputation methods: 'Y' Web based application</p> <p>Quality document associated to a dataset: N</p> <p>Validation of the final dataset: Datasets are validated by scientific consilium on the national and international level (STECF EWGs & GFCM WG, SCRS).</p>
<p>AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.</p> <p>There are no deviations from planned methodology.</p>

(Sampling scheme identifier: Scientific monitoring of commercial fisheries / Sci Obs Sea Commerc Sel Stock)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: Sci Obs Sea Commerc Sel Stock
Sampling scheme type: Commercial fishing
Observation type: SciObsAtSea
Time period of validity: 2022-2024
Short description: Sci Obs Sea Commerc Sel Stock is a sampling scheme code for all of the sampling frames (metiers) specified in Table 2.5 that relate on data sampling by scientific observers at sea.
Description of the population
<p>Population targeted: Official statistics (catch, discards, landings, effort and value data) have been used to apply the ranking system. Sampling strategy for each metier is designed partly as concurrency-at-sea (sampling directly on board by observers and scientists) and concurrency-at-landing site (sampling directly on landing site, at market etc.), taking also into account the Croatian fishing zones and their specificities. Vessel list is established according to list authorisations issued by gear type in accordance with relevant national management plans (demersal trawl, purse seine nets and seine nets), authorisations issued by vessel/gear type according to individual quota allocation (purse seine net for bluefin tuna and swordfish hook and line vessels and longline vessels), authorisations issued by vessel/gear type in fisheries restricted area (FRA) and other authorizations.</p> <p>Population sampled: The target population for the reference year will be the number of fishing trips (fishing days) by metier (sampling frame) of the previous years. The frame population is a subsample of the target population: it will be a selection of fishing trips, mainly on spatial (Croatian fishing zones and subzones) and time stratification basis (monthly, quarterly or seasonally) with measurements of the composition of the catch in order to detect seasonal differences in the demographic structure and composition of the landings for different metiers. The sampling will be accomplished as stratified random sampling: the sampling unit belonging to the metier (primary unit) will be the fishing trip (secondary unit). The number of fishing days to be sampled has been defined proportionally to the effort (number of days at sea for each metier) and the landings. For demersal trawl and purse seine nets the entire population of vessels is not available for sampling in certain periods of the year due to periods of temporary cessation of fishing activities and spatio-temporal closures implemented on a national level in accordance with management plans. Sampling plan design takes into account mentioned restrictions.</p> <p>Stratification: Fishing area under jurisdiction of the Republic of Croatia is divided into several fishing zones. Each zone has its own specific oceanographic and geomorphological characteristics and environmental conditions differ from one zone to another. Selected species for monitoring are not equally distributed across the Adriatic Sea due to its biological and ecological characteristics. For some species there is strong variation in distribution between seasons due to migrations patterns, recruitment, spawning etc. Sampling scheme is designed to cover quarterly all fishing zones in Croatia in order to achieve representative length frequency distribution and to cover different life stages as well. Croatian fishing vessels operate exclusively in the Northern Adriatic Sea (GSA 17).</p>
Sampling design and protocols
Sampling design description: During the implementation of the project activities within monitoring of

biological variables, the sampling design and protocols of the activities follow the outcomes of sampling expert groups (RCG MED & BS; RCG LP, GFCM WGs; FAO AdriaMed WGs, ICCAT) and existing common standard criteria are used (MEDITS and MEDIAS scientific surveys sampling protocols; Age determination protocols, etc.).

Sampling on board (at sea) is carried out during fishing activities with the main objective of assessing the qualitative and quantitative composition of the discarded part of the catches and taking biological samples for further sampling collection. The data for each fishing operation should contain, depending on the metier: date, name and characteristics vessel, port of departure, fishing trip code, number of hauls, name of observer, metier, whether the haul is sampled or not, coordinates of the beginning and end of fishing activities, direction (degrees), speed (knots), technical characteristics of the fishing gear (length of steel-face and turner, spreading (cm / m) or length and height of the net, number hooks, mesh size, etc.), duration of fishing, additional notes, etc. After the fishing operation, once the catch is on the deck of the vessel, sampling may be carried out - collecting data on the weight and length composition of catches (retained and discarded catch). Retained catch is the share of the total catch that goes on sale and is measured with the aim of comparison in relation to the discarded part of the catch. It is ideal to weigh the total weight of discarded catch if possible and measure the length of all target species. Besides measurements of discarded catches, scientific observers are trained to record incidental catches of vulnerable and endangered species under the GFCM protocol (FAO, 2019) and perform this activity during all on-board sampling in all meters. Sampling of vulnerable species is performed according to the GFCM methodology for data collection on vulnerable species. Attached to the methodology are forms for recording biological data of vulnerable species of marine mammals, birds, turtles, elasmobranchs and macrobenthic invertebrates. Every scientific observer is obliged to record any interaction with vulnerable species.

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

Regional coordination: RCG MED & BS; RCG LP, GFCM WGs; FAO AdriaMed WGs

Link to sampling design documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

Compliance with international recommendations: Yes.

Link to sampling protocol documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Protokoli-za-prikupljanje-podataka-i-postupanje-s-osjetljivim-vrstama_verzija-1_2021-1.pdf

Compliance with international recommendations: Yes.

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: Sampling plan is constantly monitored using online applications in which information of sampling trips are inputted in real time.

Sampling plan is adjusted in case of deviations.

Data capture

Means of data capture: Fishing gear, scales, measuring board, etc.

Data capture documentation:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

Quality checks documentation:

<https://podaci.ribarstvo.hr/prikupljanje-podataka/bioloski/>

Data storage

National database: IOF database <https://vrtlac.izor.hr/ords/riba>

International database: JRC&GFCM

Quality checks and data validation documentation:

Internal database documentation, access is granted only to project partners (IOF and DoF) with authorized credentials:

https://vrtlac.izor.hr/ords/riba/DCF_DOKUMENTACIJA.

The biological data collected during the sampling activities of the commercial catches and the discards was archived and validated using different data entry and processing programs which are constantly being updated and are suited for each métier and stock. Data with limited values are inserted using drop down list with predefined values (métier, type of sampling, species, etc.). Times and dates data are inserted using time picker insuring the same format. Numeric data are checked for value range if such is specified (coordinates, weight, etc.). In cases of errors in data entries, data will not be committed and will be marked with red notice and cannot be uploaded until the error is corrected. Visual check of graphic data representation is also available during data entry.

Automatic checks are in line with possible missing data and/or eventual errors regarding calculations. Operator managing database applications, before the final validation, can use graphic representation of data sets for easier notice of out of range data.

Improvements in sampling procedures and data analysis were implemented starting from 2020 according to the results of the European project MARE / 2016/22 STREAM “Strengthening Regional cooperation in the area of fisheries biological data collection in the Mediterranean and Black Sea”.

Sample storage

Storage description: Age structures (otoliths and spine segments) are stored in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.

Sample analysis:

https://podaci.ribarstvo.hr/files/Metodologija-za-znanstveni-monitoring-gospodarskog-i-rekreativnog-ribolova_verzija-1_HR-1.pdf

https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf

Data processing

Evaluation of data accuracy (bias and precision): N

No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the Regional sampling plan during 2022.

Editing and imputation methods: 'Y'

Web based application

Quality document associated to a dataset: N

Validation of the final dataset: Datasets are validated by scientific consilium on the national and international level (STECF EWGs & GFCM WG, SCRS).

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

There are no deviations from planned methodology.

(Sampling scheme identifier: Research surveys at sea – MEDIAS)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: MEDIAS
Sampling scheme type: Mandatory research survey
Observation type: Hydroacoustic survey
Time period of validity: 2022-2024
Short description: Sampling scheme aiming at collecting geo-referenced hydroacoustic data during annual research surveys at sea performed by research vessel equipped with calibrated scientific equipment. The scheme covers eastern part of GSA 17 (Adriatic Sea).
Description of the population
Population targeted: The primary sampling units (PSU) used in MEDIAS sampling scheme is called EDSU (Elementary Distance Sampling Unit) collected along acoustic profiles (transects). The main target species from a survey perspective are anchovy and sardine, and the main survey area covers Croatian territorial waters and EEZ.
Population sampled: MEDIAS is a multispecies survey targeting anchovy and sardine populations. A part of the target populations (anchovy and sardine) present in the survey area (i.e. eastern part of GSA17) during the survey period will be sampled. A part of the target populations present at that time in other parts of the Adriatic Sea is unreachable for sampling.
Stratification: The logic taken to stratify the population is based on biological analyses (age, length, sex) and the number of strata generated corresponds to the number of length classes, number of age classes and sex (3 strata: females, males, undetermined).
Sampling design and protocols
Sampling design description: Sampling design is based on 32 acoustic profiles (transects); two of them are located in inner sea (northern and southern part) and adapted to geomorphology of these areas, while 30 parallel acoustic profiles (transects) are located in the open sea, oriented in 43°-223° direction, with 10 NM distance between them. Toward open sea the length of acoustic profiles is determined by Croatian EEZ outer border or by 200 m bathymetry.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: MEDIAS Steering Committee; participating MS: Spain, France, Italy, Slovenia, Croatia, Greece
Link to sampling design documentation: https://podaci.ribarstvo.hr/files/MEDIASHandbookApril2021.pdf
Compliance with international recommendations: Y
Link to sampling protocol documentation: https://podaci.ribarstvo.hr/files/MEDIASHandbookApril2021.pdf

Compliance with international recommendations: Y
Sampling implementation
Recording of refusal rate: NA
Monitoring of sampling progress within the sampling year: Sampling is adjusted to take into account weather conditions during the survey (if necessary number of days may be increased).
Data capture
Means of data capture: calibrated scientific echosounder SIMRAD EK80, research vessel' navigation equipment (GPS), mid-water trawl, calibrated on-board balances, calibrated CTD probe, ichtiometer, plankton net.
Data capture documentation: https://podaci.ribarstvo.hr/files/MEDIASHandbookApril2021.pdf
Quality checks documentation: N No documentation on the quality checks of data capture exists. All captured data are checked by scientists involved in the survey.
Data storage
National database: IOF database: https://vrtlac.izor.hr/ords/riba/m_tereni_prikaz .
International database: final results from the survey are stored in JRC database
Quality checks and data validation documentation: Internal database documentation, access is granted only to project partners (IOF and DoF) with authorized credentials: https://vrtlac.izor.hr/ords/riba/DCF_DOKUMENTACIJA .
Sample storage
Storage description: Acoustic samples together with navigation data are stored as raw data files in electronic form. Age structures (otoliths) are stored as digital images in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.
Sample analysis: See descriptions at https://podaci.ribarstvo.hr/files/MEDIASHandbookApril2021.pdf
Data processing
Evaluation of data accuracy (bias and precision): Y - data are collected using previously calibrated measuring equipment (calibrated echosounder, calibrated CTD probe, calibrated weighing balances). As described in MEDIAS Handbook: https://podaci.ribarstvo.hr/files/MEDIASHandbookApril2021.pdf
Editing and imputation methods: N
Quality document associated to a dataset: Y - calibration report for scientific echosounder before survey (as requested in MEDIAS Handbook).
Validation of the final dataset: Data validation tool is used: https://datacollection.jrc.ec.europa.eu/dvt/medbs#_48_INSTANCE_JaOp6V2u1Iyk_%3Dindex.xhtml
AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.
There are no deviations from planned methodology.

(Sampling scheme identifier: Research surveys at sea – MEDITS)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: MEDITS
Sampling scheme type: Mandatory research survey
Observation type: Bottom trawl survey
Time period of validity: 2022-2024
Short description: The MEDITS survey programme intends to produce basic information on benthic and demersal species in term of population distribution as well as demographic structure, on the continental shelves and along the upper slopes at a global scale in the Mediterranean Sea, through systematic bottom trawl surveys.
Description of the population
Population targeted: The MEDITS is a scientific fishery independent bottom trawl survey. The main target species belongs to group G1 of the MEDITS sampling protocol. The main survey area covers the eastern part of GSA17 area (Adriatic Sea), with an area of approximately 550.000 km ² .
Population sampled: MEDITS is a multispecies survey targeting the demersal population of fish, cephalopods, crustaceans and other invertebrate species that belong to D, E, V, G, H taxonomic category V, G, H according to MEDITS sampling protocol. A part of the target populations present in the survey area (i.e. eastern part of GSA17) during the survey period will be sampled. A part of the target populations present at that time in other parts of the Adriatic Sea is unreachable for sampling.
Stratification: The logic taken to stratify the population is based on biological analyses (age, length, sex) and the number of strata generated corresponds to the number of length classes, number of age classes and sex (3 strata: females, males, undetermined).
Sampling design and protocols
Sampling design description: The MEDITS is conducted in spring - summer period from May to July based on MEDITS protocol, using specially designed bottom trawl net GOC 73. Sampling stations are randomly distributed according to the depth strata (10-50; 50-100; 100-200; 200-500; 500-800 m) and the number of stations is proportional to the surface of each stratum. The duration of tow in the area shallower than 200 m is 30 min, while in the area deeper than 200 m is 60 min. On board the vessel, the catches are split into the categories and sub-categories as reported in Annex V and XV of the manual. For each species the total weight and number of individuals should be collected, excluding the taxonomic category V, G, H for which only the total weight should be collected. For taxonomic categories D and E the number of individuals is not mandatory. When the catch of a given species or a fraction of a given species (e.g. juveniles) is too abundant to be measured <i>in extenso</i> it is reasonable to take a representative subsample of the catch. This sub-sample should be not less than 100 individuals.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: MEDITS Working Group is in charge of survey planning; participating MS: Spain, France, Italy, Slovenia, Croatia, Montenegro, Albania, Greece, Cyprus and Malta.
Link to sampling design documentation: https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf

<p>Compliance with international recommendations: Y</p> <p>Link to sampling protocol documentation: https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf</p> <p>Compliance with international recommendations: Y</p>
<p>Sampling implementation</p> <p>Recording of refusal rate: NA</p> <p>Monitoring of sampling progress within the sampling year: Sampling is adjusted to take into account weather conditions during the survey (if necessary number of days may be increased). MEDITS is a mandatory survey that should be conducted according to the National Work plan that is in line with EU MAP Delegated Decision. National coordination is in charge to follow-up the progress of the survey and to establish the mitigation measures. Bilateral agreement with other MS or institutions could be established to resolve issues.</p>
<p>Data capture</p> <p>Means of data capture: Bottom trawl net, scales, electronic measuring board, CTD</p> <p>Data capture documentation: https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf</p> <p>Quality checks documentation: N No documentation on the quality checks of data capture exists. All captured data are checked by scientists involved in the survey.</p>
<p>Data storage</p> <p>National database: TruSt and ATrIS database software International database: NA</p> <p>Quality checks and data validation documentation: https://www.sibm.it/MEDITS%202011/new/RoME_April_2019/RoME%201.4%20User%20Manual%20-%202019.pdf https://www.faoadriamed.org/pdf/User_manual_ATrIS.pdf</p>
<p>Sample storage</p> <p>Storage description: Age structures (otoliths) are stored in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.</p> <p>Sample analysis: See descriptions at https://podaci.ribarstvo.hr/files/Medits_Handbook_2017_version_9.pdf</p>
<p>Data processing</p> <p>Evaluation of data accuracy (bias and precision): N No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the MEDITS working group by the end of implementation period.</p> <p>Editing and imputation methods: Y https://www.faoadriamed.org/pdf/User_manual_ATrIS.pdf</p> <p>Quality document associated to a dataset: N</p> <p>Validation of the final dataset: Datasets are validated by scientific consilium on the national level.</p>

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

There are no deviations from planned methodology.

(Sampling scheme identifier: Research surveys at sea – SOLEMON)

MS: Croatia
Region: Mediterranean Sea and Black Sea
Sampling scheme identifier: SOLEMON
Sampling scheme type: Mandatory research survey
Observation type: Adriatic Rapido Trawl Survey
Time period of validity: 2022-2024
Short description: The main survey objectives are: a) Assessing abundance, distribution in GSA17 of sole and other important demersal resources by surveys with “rapido” gears suitable to seize flatfish and other benthic animals. b) Pursuing the studies on the ecosystem impact of the “rapido” trawl fishery. c) Contribution to the setting of the GES and targets for the Adriatic Sea in the framework of an ecosystem approach, thus matching to the requirement of the implementation of the MSFD (Directive 2008/56/EC).
Description of the population
Population targeted: The SOLEMON is a scientific fishery independent rapido (beam trawl) survey. The main target species is <i>Solea solea</i> . The survey area covers the northern part of the Adriatic Sea (GSA17).
Population sampled: A part of the target populations of <i>Solea solea</i> present in the survey area (i.e. northern part of GSA17) during the survey period will be sampled. A part of the target populations present at that time in other parts of the Adriatic Sea is unreachable for sampling.
Stratification: The logic taken to stratify the population is based on biological analyses (age, length, sex) and the number of strata generated corresponds to the number of length classes, number of age classes and sex (3 strata: females, males, undetermined).
Sampling design and protocols
Sampling design description: SOLEMON is conducted in the autumn- winter period from October to December based on SOLEMON protocol. The survey vessel utilizes two gears simultaneously; taking the characteristics of the gear and the rigging into account the warps should have a diameter of 14-16 mm. The length of warps to be shot is determined by the depth. The gear positioned in the right side of the vessel has 15 m of warp more than the other, in order to avoid possible interference between the two gears during the haul. The hauls are planned according to a depth-stratified sampling scheme with random allocation of the positions of sampling stations within each stratum.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: FAO AdriaMed Working Group is in charge of survey planning; participating MS: Italy, Slovenia and Croatia
Link to sampling design documentation: https://podaci.ribarstvo.hr/files/SOLEMON-Handbook_2019_Ver_4.pdf
Compliance with international recommendations: Y

<p>Link to sampling protocol documentation: https://podaci.ribarstvo.hr/files/SOLEMON-Handbook_2019_Ver_4.pdf</p> <p>Compliance with international recommendations: Y</p>
<p>Sampling implementation</p> <p>Recording of refusal rate: NA</p> <p>Monitoring of sampling progress within the sampling year: Sampling is adjusted to take into account weather conditions during the survey (if necessary number of days may be increased). SOLEMON is a mandatory survey that should be conducted according to the National Work plan that is in line with EU MAP Delegated Decision. National coordination is in charge to follow-up the progress of the survey and to establish the mitigation measures. Bilateral agreement with other MS or institutions could be established to resolve issues.</p>
<p>Data capture</p> <p>Means of data capture: Beam trawl net, scales, electronic measuring board, CTD</p> <p>Data capture documentation: https://podaci.ribarstvo.hr/files/SOLEMON-Handbook_2019_Ver_4.pdf</p> <p>Quality checks documentation: Y https://podaci.ribarstvo.hr/files/SOLEMON-Handbook_2019_Ver_4.pdf</p>
<p>Data storage</p> <p>National database: TruSt and ATrIS database software International database: NA</p> <p>Quality checks and data validation documentation: https://www.faoadriamed.org/pdf/User_manual_ATrIS.pdf</p>
<p>Sample storage</p> <p>Storage description: Age structures (otoliths) are stored in the IOF permanently, while soft tissue (biological specimens) are temporarily stored in the IOF cold storage (max 6 months) until processing in the laboratory after they are discarded. Access to samples are organised to scientists by IOF staff. No samples are stored under the auspices/responsibility of an international organization. There is no link on information on quantities of samples stored.</p> <p>Sample analysis: See descriptions at https://podaci.ribarstvo.hr/files/SOLEMON-Handbook_2019_Ver_4.pdf</p>
<p>Data processing</p> <p>Evaluation of data accuracy (bias and precision): N No documentation on the evaluation of data accuracy exists. It is expected that procedures will be developed at regional level in the framework of the FAO AdriaMed working group by the end of implementation period.</p> <p>Editing and imputation methods: Y https://www.faoadriamed.org/pdf/User_manual_ATrIS.pdf</p> <p>Quality document associated to a dataset: N</p> <p>Validation of the final dataset: Datasets are validated by scientific consilium on the national level.</p> <p>AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.</p>

There are no deviations from planned methodology.

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.

(Sampling scheme identifier: Fishing activity and economic data for fisheries / Census)

<p>Survey Specifications</p> <p><i>Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.</i></p> <p><i>Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.</i></p> <p><i>Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.</i></p>
<p>Sector name(s): Fisheries</p>
<p>Sampling scheme: Census</p>
<p>Variables: Fishing activity variables and economic variables for the fishing fleet (Consumption of fixed capital, Days at sea, Energy consumption, Energy costs, Gross value of landings, Mean age of vessels, Mean LOA of vessels, Number of fishing enterprises/units, Number of vessels, Operating subsidies, Subsidies on investments, Total vessel power, Total vessel tonnage, Value of physical capital).</p>
<p>Supra region(s): Mediterranean Sea and Black Sea</p>
<p>Survey planning</p> <p>Survey is performed by MA-DoF according to the Ordinance on the content, form and manner of delivery of socio-economic data in fisheries (OG 79/2020). Respondents are required to submit data by June 1st for the previous year.</p>
<p>Survey design and strategy</p> <p>Data sources: fishing fleet register, log books, monthly catch reports (“coastal logbooks”), sales notes, VMS, blue diesel/fuel records, records of paid subsidies, and questionnaires stored in the Fishery Information System administered by MA-DoF and financial accounts obtained from FINA.</p> <p>Collection of the fishing activity and economic variables of the fleet is based on two major data sources:</p> <p>a) Fishery Information System administered by DoF (fishing activity variables, volume and value of blue diesel/fuel consumed per vessel/aquaculture farm; information on paid subsidies etc.); and</p> <p>b) Questionnaires for economic data collection.</p> <p>The consistency of information coming from questionnaires and administrative sources is assured by cross-checking information from the different data sources.</p> <p>Determination of sample size:</p> <p>Data is collected on census level for all fleet segments.</p>

Based on the basic data on the population and data on the use of fishing gears retrieved and stored, after data has been validated and verified, a segmentation of the fishing fleet is performed. In some cases fleet segments are clustered for sampling purposes or reporting purposes for confidentiality reasons. As clustering depends entirely on the activity of vessels, in cases where clustering is needed, vessel activity is reviewed on a vessel to vessel case. In cases where a vessel changes its activity from one year to another inconsistently, it is directly reflected in the clustering.

On the basis of determined fleet segments, the procedure for determining sample sizes is carried out.

In order to estimate the sample size for the collection of economic variables, the variability of GT and kW is calculated. Coefficient of GT variation is used as a basis to define the sample size of the total fleet.

The sample is distributed among the relevant strata with the principal objective of minimizing the sampling error to be obtained for the stratification variable. The optimum Neyman allocation, which guarantees a minimum variance for the variable used in the stratification, is used for this purpose.

The sample size for each stratum is adjusted in accordance with several minimum rules: not less than 10% of each stratum, not less than 5 observations per segment with <50 active vessels assuming the response rate of 50%.

Stratification on the basis of representative sub-sample per coastal county will be made which should result in a somewhat higher sample rate overall. This has to be done in order to try to reach a representative sample size for each coastal county for two reasons: 1) efficiently organize sampling among data collectors in seven DoF field units and 2) enable economic analysis at the level of smaller units for the purposes of evaluating FLAG strategies, different development plans at municipal level etc.

For fleet segments under strict management measures all licence holders are contacted, due to the importance of a higher response rate.

Survey methods and distribution: questionnaire forms by post, by email, on website (national DCF and DoF), by phone, notice boards in DoF field units, directly in DoF field units.

Economic data is collected by questionnaire forms; the type of data collection scheme is probability sample survey by stratified random sampling.

Estimation design

Estimation procedures are performed according to agreed methodologies published on the official DCF web site (<https://datacollection.jrc.ec.europa.eu/docs-links/socio-eco-var>).

The calculation of variables Consumption of fixed capital and Value of physical capital is based on data from questionnaires and financial accounts in accordance with the PIM methodology, proposed in the report of study No FISH/2005/03. The age data is available per each vessel in the Fleet register. The data on the value of physical capital (replacement, insurance and purchase is collected through the questionnaire by DoF). The proposed DCF Excel template for the calculation of the capital costs will be used.

Estimation of subsidies: DoF records on direct subsidies are used as well as questionnaires. In cases where enterprises have more than one vessel, the amount of subsidies is allocated to vessels based on GT, as subsidies are collected on an enterprise level. The estimations are cross-checked by allocating the total amount of subsidies paid to respective fleet segments using the share of landings value of the fleet segment. In the end, three sets of estimations are compared to reach a sound conclusion.

Estimation of energy consumption and energy costs: For the estimation of energy consumption and energy cost blue diesel/fuel records are used. The register of blue diesel/fuel is updated annually on the amount of fuel consumed per vessel. No estimation to determine totals is used, as data is collected on a census basis. Energy consumption and information on subsidies (as a second data source) was excluded from DoF questionnaires to avoid duplication of data collection. According to several years of cross-check, FINA and DoF records are proven to be sufficient and there is no need to keep two data sources. PGECON was consulted on the change of methodology in 2019.

Response rates: To ensure the quality of data collected accuracy of the data that will be calculated. The data

quality evaluation depends on the data collection scheme. In all cases (census and probability sampling) *unit response rate* (number of enterprises responded/total sample) and *item response rate* (response rate per each variable) is calculated as follows:

$$r_j = \frac{n}{N} * 100\%$$

r_j – Response rate (per item j);

N – Total number of vessels in the sample;

n – Number of vessels which provided the data (questionnaire/per each variable).

Coverage rate (number of responses/total population) is calculated in case of probability sampling survey.

It is planned that random samples be used and the sample size adjusted in accordance with the response rate during the implementation.

Error checks

Croatia has a national plan for the validation systems as per Article 109 (8) of the Control Regulation. The National Plan for the Implementation of the Validation and Verification System in Republic of Croatia was approved by Commission Implementing Decision (EU) 2015/2277 of 2 December 2015. During 2015 Croatia started implementing the VALID system which is continuously being developed further and is used to control data quality. VALID automatic cross-check procedures operate in addition to local validations on data-entry and are based on several validation rules packages (EC core rules, national VMS rules, fleet registrations/licensing, catch report/qualitative statistical analysis etc.).

Statistical cross-check procedures are performed prior to reporting according to data collection on-demand validation reports and internal procedures for statistical and reporting purposes for data end users (EC, ICCAT, GFCM, EUROSTAT, FAO etc.) under DCF and include specific rules developed for each report in order to verify and validate data.

In 2016 the upgrading of the national FIS (Fisheries Information System) in regard to the fleet register and the new FIS module used for license issuing has been finalized. Both registers, fleet register and register of licences, are directly linked which enables efficient data verification of data. Catch reporting requirements in Croatia for all vessels less than 10 m LoA are based on monthly catch reports that are particularly suited for passive gears. Small-scale vessels for personal needs, that were transferred to the commercial fleet in 2015 also fall under the national requirement. As the current calculation of fishing days previously slightly exaggerated fishing days for passive gears, the methodology was harmonized with results of the DCF Workshops on transversal variables in 2017. Starting from 2017 and 2018 a full traceability system of fisheries products up until first sale was planned to be established in 2019 and 2020. This process started in 2016 by implementing an electronic transport document and linking first sale with logbooks and catch reports. The aim is to enhance the estimation of economic indicators and monitor fish prices in domestic market as well as import and export more efficiently.

In addition to obligations pursuant to Article 9 of the Basic Regulation, the following vessels are equipped with a VMS device and e-logbook: every authorized active demersal trawler (OTB), purse seiner (PS) and vessel with dredges (DRB) regardless of LoA, HL and LL vessels with BFT/SWO quota, vessels with quota for recreational fisheries of BFT. The e-logbook has greatly improved catch reporting and timely availability of catch and effort data in recent years. In addition to elements as required by the Basic regulation, the information on fish size of sardine and anchovy was added to the e-logbook for purse seiners. As fisheries in Croatia are managed through national fishing zones, fish size is an important element in terms of indirectly monitoring the stocks. As this data is linked with VMS data, the indication of the movement of fish of a certain size in certain periods and fishing zones is obtained.

Croatia is currently developing mobile applications (mTransportDocument, mSalesNote, mCatchReport and

mLogbook) to facilitate reporting by the sector. This should lessen the administrative burden of data entry into FIS and enable the DoF to focus more resources on data validation and verification.

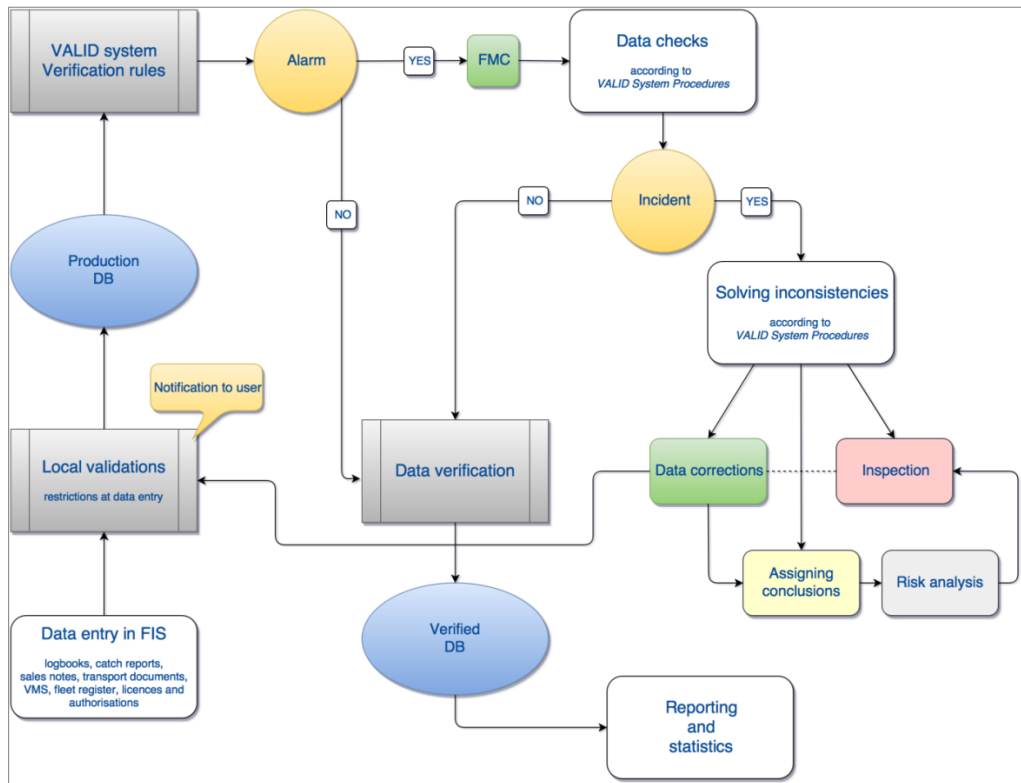


Chart 1. Flow chart of the data validation and verification system for fisheries

All questionnaires are checked by DoF employees and all strange or unknown data reviewed and compared to financial accounts. An analysis of the entire time series of economic data for individual CFRs was made during the course of data-check, to reveal nonconformities, as well as an analysis of outliers and missing data at the fleet segment level. In some cases, respondents were asked to clarify information they submitted. Intermediate results and output are regularly compared to previous year's results.

Prior to reporting, extensive statistical validation procedures are done with the support of the Fisheries Monitoring Centre and DoF field units. This process is started after data input has been confirmed and data base is closed for new inputs, and lasts for 2 months. Validation of data in the main production FIS database is carried out in two steps: DCF unit performs statistical validation analysis and requests from the Fisheries Monitoring Centre and MA-DoF field units to check specified documentation and resolve any errors. Check is performed for a second time to resolve any new errors resulting from data corrections.

For the purpose of reporting preliminary data for the previous year the validation procedure is performed in January-March, and for the purpose of finalizing data for the previous year (after all documentation is entered in FIS and main production database is locked) final validation is performed in November-December. Final dataset for N-1 referent year is available after 15th December.

Validation procedures are divided into several categories:

- checking of data according to management regulatory mechanisms (authorized gears, fishing day limits, catch limits, fishing in prohibited areas etc.)
- completeness and errors of data in log-books, fishing reports and sales notes
- cross-checking of data between e-log-books and VMS
- cross-checking of data between log-books, fishing reports and sales notes
- verification of reported PET species and discards
- cross-checking of data reported for species under TACs (BFT and SWO)

- detailed data check for all species under stock assessments
- validation of landing data by species/fishing gear
- verification of data in sales notes (price outliers by species, month, fleet segment, double reporting etc.)
- validation of socio-economic data (outliers by variable and fleet segment, consistency of historical data by vessel etc.)
- checking completeness of blue diesel/fuel records
- checking of specific errors for each type of documentation (e-logbooks, paper logbooks, m-logbooks, catch reports, m-catch reports), and
- collecting all relevant metadata necessary for reporting.

Data storage and documentation

Describe how the data is stored.
Provide link to webpage where additional methodological documentation can be found, if any.

Additional methodological information on fishing activity data:

<https://podaci.ribarstvo.hr/metodologija/transverzalni/>

Additional methodological information on socio-economic data:

<https://podaci.ribarstvo.hr/metodologija/socioekonomski/>

Revision

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

Croatia updates each year N-2 capacity/landing/effort data. Croatia implements catch reporting for all fishing vessels (including passive gears below 10 m LoA), all fisherman are required to submit logbooks or catch reports for passive gears. While all active gears and gears under management regimes are obligated to submit electronic real time logbooks, in the case of passive gears fisherman submit paper catch reports which have to be processed by MA-DoF. Therefore data for the N-1 is finalized by the end of year N. This means that Croatia resubmits N-2 data after it is finalized to avoid discrepancies each reporting year.

Confidentiality

Are procedures for confidential data handling in place and documented?

Yes

Are protocols to enforce confidentiality between DCF partners in place and documented?

NA.

Are protocols to enforce confidentiality with external users in place and documented?

Yes

Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No.

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

There are no deviations from planned methodology.

(Sampling scheme identifier: Socio-economic data for fisheries / Probability Sample Survey)

<p>Survey Specifications</p> <p><i>Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.</i></p> <p><i>Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.</i></p> <p><i>Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.</i></p>
<p>Sector name(s): Fisheries</p>
<p>Sampling scheme: Probability Sample Survey</p>
<p>Variables: Economic and social variables for the fishing fleet (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, Other income, Other non-variable costs, Other variable costs, Paid labour, Personnel costs, Repair and maintenance costs, Total hours worked per year (optional), Total assets, Unpaid labour, Value of quota and other fishing rights, Value of unpaid labour).</p>
<p>Supra region(s): Mediterranean Sea and Black Sea</p>
<p>Survey planning</p>
<p>Survey is performed by MA-DoF according to the Ordinance on the content, form and manner of delivery of socio-economic data in fisheries (OG 79/2020). Respondents are required to submit data by June 1st for the previous year.</p>
<p>Survey design and strategy</p>
<p>Data sources: questionnaires, financial accounts.</p> <p>Collection of the economic variables of the fleet is based on two major data sources:</p> <p>a) Fishery Information System administered by DoF (fishing activity variables, volume and value of blue diesel/fuel consumed per vessel/aquaculture farm; information on paid subsidies etc.); and</p> <p>b) Questionnaires for socio-economic data collection (annually) and detailed questionnaires for social data collection (every three years).</p> <p>The consistency of information coming from questionnaires and administrative sources is assured by cross-checking information from the different data sources.</p> <p>Determination of sample size:</p> <p>Based on the basic data on the population and data on the use of fishing gears retrieved and stored, after data has been validated and verified, a segmentation of the fishing fleet is performed. In some cases fleet segments are clustered for sampling purposes or reporting purposes for confidentiality reasons. As clustering depends entirely on the activity of vessels, in cases where clustering is needed, vessel activity is reviewed on a vessel to vessel case. In cases where a vessel changes its activity from one year to another inconsistently, it is directly reflected in the clustering.</p> <p>On the basis of determined fleet segments, the procedure for determining sample sizes is carried out. In order to estimate the sample size for the collection of economic variables, the variability of GT and kW is calculated. Coefficient of GT variation is used as a basis to define the sample size of the total fleet. The sample is distributed among the relevant strata with the principal objective of minimizing the sampling error to be obtained for the stratification variable. The optimum Neyman allocation, which guarantees a minimum variance for the variable used in the stratification, is used for this purpose.</p>

The sample size for each stratum is adjusted in accordance with several minimum rules: not less than 10% of each stratum, not less than 5 observations per segment with <50 active vessels assuming the response rate of 50%.

Stratification on the basis of representative sub-sample per coastal county will be made which should result in a somewhat higher sample rate overall. This has to be done in order to try to reach a representative sample size for each coastal county for two reasons: 1) efficiently organize sampling among data collectors in seven DoF field units and 2) enable economic analysis at the level of smaller units for the purposes of evaluating FLAG strategies, different development plans at municipal level etc.

For fleet segments under strict management measures all licence holders are contacted, due to the importance of a higher response rate.

Survey methods and distribution: questionnaire forms by post, by email, on website (national DCF and DoF), by phone, notice boards in DoF field units, directly in DoF field units.

Socio-economic data is collected by questionnaire forms; the type of data collection scheme is probability sample survey by stratified random sampling and in some cases a census survey. For the variables Consumption of fixed capital and Value of physical capital Indirect survey is applied.

Estimation design

Estimation procedures are performed according to agreed methodologies published on the official DCF web site (<https://datacollection.jrc.ec.europa.eu/docs-links/socio-eco-var>).

In cases where response rate is inadequate to reach a statistically sound estimation, a simple regression is used to cross-check results or estimate totals. Low response rate is typically a problem of data collection for the small-scale fleet, for which questionnaire return rate is low, data in questionnaires inconsistent, unreliable and sometimes unreadable as in most cases there is no professional accounting. To tackle these issues, considerably more effort is placed into data collection for the fishermen involved in small scale fisheries, including direct contact, reviewing questionnaires, cross checking data to ensure a more complete data sets, higher quality and more reliable results.

Estimation of FTE: The number of hours worked during the year, collected from the enterprises through the economic questionnaire, is divided by national annual full-time working hours (based on the CBS methodology).

Response rates: To ensure the quality of data collected accuracy of the data that will be calculated. The data quality evaluation depends on the data collection scheme. In all cases (census and probability sampling) unit response rate (number of enterprises responded/total sample) and item response rate (response rate per each variable) is calculated as follows:

$$r_j = \frac{n}{N} * 100\%$$

r_j – Response rate (per item j);

N – Total number of vessels in the sample;

n – Number of vessels which provided the data (questionnaire/per each variable).

Coverage rate (number of responses/total population) is calculated in case of probability sampling survey.

It is planned that random samples be used and the sample size adjusted in accordance with the response rate during the implementation.

Error checks

Statistical cross-check procedures are performed prior to reporting according to data collection on-demand

<p>validation reports and internal procedures for statistical and reporting purposes for data end users (EC, ICCAT, GFCM, EUROSTAT, FAO etc.) under DCF and include specific rules developed for each report in order to verify and validate data.</p> <p>All questionnaires are checked by DoF employees and all strange or unknown data reviewed and compared to financial accounts. An analysis of the entire time series of economic data for individual vessels is made during the course of data-check, to reveal nonconformities, as well as an analysis of outliers and missing data at the fleet segment level. In some cases, respondents are asked to clarify information they submitted. Intermediate results and output are regularly compared to previous year's results.</p>
<p>Data storage and documentation</p>
<p>Describe how the data is stored. Provide link to webpage where additional methodological documentation can be found, if any.</p> <p>Additional methodological information on fishing activity data: https://podaci.ribarstvo.hr/metodologija/transverzalni/</p> <p>Additional methodological information on socio-economic data: https://podaci.ribarstvo.hr/metodologija/socioekonomski/</p>
<p>Revision</p>
<p><i>Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.</i></p> <p>Historical data is revised in case new methodologies are applied according RCG ECON methodologies, or in cases previous estimated were revised according to updated data.</p>
<p>Confidentiality</p>
<p><i>Are procedures for confidential data handling in place and documented?</i> Yes</p> <p><i>Are protocols to enforce confidentiality between DCF partners in place and documented?</i> NA.</p> <p><i>Are protocols to enforce confidentiality with external users in place and documented?</i> Yes</p> <p><i>Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.</i> No.</p>
<p>AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.</p> <p>There are no deviations from planned methodology.</p>

(Sampling scheme identifier: Socio-economic data for aquaculture / Census)

<p>Survey Specifications</p>
<p><i>Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.</i></p>

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: Economic variables for marine and freshwater aquaculture (Energy costs, Number of enterprises by size category, Operating subsidies, Subsidies on investments, Weight of sales per species)

Supra region(s): Mediterranean Sea and Black Sea

Survey planning

Survey is performed by MA-DoF according to the Ordinance on the content, form and manner of delivery of socio-economic data in fisheries (OG 79/2020). Respondents are required to submit data by June 1st for the previous year.

- Number of enterprises by size category: DoF registry of licences.
- Weight of sales per species: logbook in aquaculture (DoF records on breeding and hatching),
- Energy costs: DoF calculation based on records on blue diesel consumption and average prices, cross-checked with data form the questionnaires, and
- Operating subsidies, Subsidies on investments: DoF records on paid subsidies.

Survey design and strategy

Data sources: aquaculture logbooks, blue diesel/fuel records, records of paid subsidies, registry of licences.

Administrative sources of data available to MA-DoF:

Data is collected from administrative sources of data available to MA-DoF including:

- Number of enterprises by size category: DoF registry of licences.
- Weight of sales per species: logbook in aquaculture (DoF records on breeding and hatching),
- Energy costs: DoF calculation based on records on blue diesel consumption and average prices, cross-checked with data form the questionnaires, and
- Operating subsidies, Subsidies on investments: DoF records on paid subsidies.

Determination of sample size:

Data collection for all techniques and species groups shall be carried out on the basis of a census.

Segmentation will be based on species and technique. Since a large number of enterprises are producing more than one species, additional segmentation is based on the value of production attributed to one species.

Survey methods and distribution:

Fishery Information System administered by MA-DoF (aquaculture farm registry and log-books, volume and value of blue diesel consumed per aquaculture farm; information on paid subsidies etc.).

Estimation design

No estimation on census data is planned, administrative sources are complete for all enterprises in the population.

Since a large number of shellfish enterprises are producing more than one species with significantly different market value (with an increasing volume and value of oysters and decreasing quantities of mussels), in order to make the segmentation more precise, to the additional segmentation, based on the value of production attributed

to one species, the third criteria shall be applied - the total area of production per species.

Estimation of direct subsidies: DoF records on direct subsidies are used.

Estimation of energy costs: For the estimation of energy consumption and energy cost blue diesel records are used. The register of blue diesel is updated annually on the amount of fuel consumed per aquaculture farm. No estimation to determine totals is used, as data is collected on a census basis. Energy consumption and information on subsidies (as a second data source) was excluded from DoF questionnaires to avoid duplication of data collection. According to several years of cross-check, FINA and DoF records are proven to be sufficient and there is no need to keep two data sources. PGECON was consulted on the change of methodology in 2019.

Response rates: To ensure the quality of data collected accuracy of the data that will be calculated. The data quality evaluation depends on the data collection scheme. In all cases (census and probability sampling) unit response rate (number of enterprises responded/total sample) and item response rate (response rate per each variable) is calculated as follows:

$$r_j = \frac{n}{N} * 100\%$$

r_j – Response rate (per item j);

N – Total number of aquaculture enterprises in the sample;

n – Number of aquaculture enterprises which provided the data (questionnaire/per each variable).

Coverage rate (number of responses/total population) is calculated in case of probability sampling survey.

It is planned that random samples be used and the sample size adjusted in accordance with the response rate during the implementation.

Error checks

Data on aquaculture sector are regularly checked with data from the Financial agency and starting from 2017 with Structural Business Statistics Data (SBS) from Croatian Bureau of Statistics aggregated by company size (number of employees). SBS data related to population is also checked by detailed insight into companies' activities during the reference year.

The consistency of information coming from questionnaires and administrative sources is assured by cross-checking information from the different data sources.

Data storage and documentation

Describe how the data is stored.

Provide link to webpage where additional methodological documentation can be found, if any.

Additional methodological information on socio-economic data:

<https://podaci.ribarstvo.hr/metodologija/socioekonomski/>

Revision

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

So far data has not been revised.

Confidentiality

Are procedures for confidential data handling in place and documented?

<p>Yes <i>Are protocols to enforce confidentiality between DCF partners in place and documented?</i> NA. <i>Are protocols to enforce confidentiality with external users in place and documented?</i> Yes <i>Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.</i> No.</p>
<p>AR comment: Indicate any deviations. Do not change the text already adopted in the work plan.</p> <p>There are no deviations from planned methodology.</p>

(Sampling scheme identifier: Socio-economic data for aquaculture / Probability Sample Survey)

<p>Survey Specifications</p>
<p><i>Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.</i> <i>Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.</i> <i>Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.</i></p>
<p>Sector name(s): Aquaculture</p>
<p>Sampling scheme: Probability Sample Survey</p>
<p>Variables: Economic and social variables for marine and freshwater aquaculture (Consumption of fixed capital, 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 hours worked by employees and unpaid workers (optional), Other income, Other operating costs, Paid labour, Personnel costs, Raw material: feed costs, Raw material: livestock costs, Repair and maintenance costs, Total value of assets, Unpaid labour, Value of unpaid labour)</p>
<p>Supra region(s): Mediterranean Sea and Black Sea</p>
<p>Survey planning</p>
<p>Survey is performed by MA-DoF according to the Ordinance on the content, form and manner of delivery of socio-economic data in fisheries (OG 79/2020). Respondents are required to submit data by June 1st for the previous year. Data collection for all techniques and species groups shall be carried out on the basis of a Probability Sample Survey. Data collection will be conducted by phone contact with subjects, introducing them with the data collection, and sending questionnaires together with guidelines by post or email. To ensure data consistency for all segments, together with each variable defined in the guidelines, a link to accounting code in financial accounts is provided. The subject will have time two weeks to prepare documentation for data collection and after that a data collector will arrange a visit to farm office or accounting office to check and collect the requested data. For some cases</p>

where it is not possible to ensure direct contact, the subjects answer the questionnaires with telephone consultation and send it to DoF by e-mail.

Survey design and strategy

Data sources: questionnaires, financial accounts.

There are two main sources of data - some variables will be collected from DoF database and subsidies register while some will be taken from questionnaires. For cross-checking, data from the Croatian Financial Agency (FINA) will be used, which is mostly connected with the financial accounts, but only for companies who have to deliver their data due to their size category or net profit.

Determination of sample size:

Data collection for all techniques and species groups shall be sampled on the basis of a Probability Sample Survey.

Survey methods and distribution: questionnaire forms by post, by email, on website (national DCF and DoF), by phone, notice boards in DoF field units, directly in DoF field units.

Socio-economic data is collected by questionnaire forms; the type of data collection scheme is probability sample survey by stratified random sampling.

Collection of the economic variables of the fleet is based on two major data sources:

- a) Fishery Information System administered by DoF (aquaculture farm registry and log-books, volume and value of blue diesel consumed per aquaculture farm; information on paid subsidies etc.); and
- b) Questionnaires for socio-economic data collection.

The consistency of information coming from questionnaires and administrative sources is assured by cross-checking information from the different data sources.

Segmentation will be based on species and technique. Since a large number of enterprises are producing more than one species, additional segmentation is based on the value of production attributed to one species.

Estimation design

Estimation procedures are performed according to agreed methodologies published on the official DCF web site (<https://datacollection.jrc.ec.europa.eu/docs-links/socio-eco-var>).

In cases where response rate is inadequate to reach a statistically sound estimation, a simple regression is used to cross-check results or estimate totals.

One of the main problems is low response and cooperation so estimation needs to be used. Missing variables can be estimated from the FINA database and from Croatian national statistics bureau. Also, additional attention will be made on collecting data, especially on small-scale companies in marine aquaculture, so as in freshwater aquaculture. Since in Croatia there are different levels of enterprises legal registration with different accounting methods, it came clear during data collecting that is necessary to adjust guidelines for each of them. Two different questionnaires with different approach shall be devised. The first one, for small-scale companies, tailored to their business activities and the way of leading accounting records. Other for larger companies where it is easier to respond to inquiries and requests submitted to them.

Since a large number of shellfish enterprises are producing more than one species with significantly different market value (with an increasing volume and value of oysters and decreasing quantities of mussels), in order to make the segmentation more precise, to the additional segmentation, based on the value of production attributed to one species, the third criteria shall be applied - the total area of production per species.

Estimation of FTE: The number of hours worked during the year, collected from the enterprises through the economic questionnaire, is divided by national annual full-time working hours (based on the CBS methodology).

Response rates: To ensure the quality of data collected accuracy of the data that will be calculated. The data quality evaluation depends on the data collection scheme. In all cases (census and probability sampling) unit response rate (number of enterprises responded/total sample) and item response rate (response rate per each variable) is calculated as follows:

$$r_j = \frac{n}{N} * 100\%$$

r_j – Response rate (per item j);

N – Total number of aquaculture enterprises in the sample;

n – Number of aquaculture enterprises which provided the data (questionnaire/per each variable).

Coverage rate (number of responses/total population) is calculated in case of probability sampling survey.

It is planned that random samples be used and the sample size adjusted in accordance with the response rate during the implementation.

Error checks

Data on processing industry and aquaculture sector are regularly checked with data from the Financial agency and starting from 2017 with Structural Business Statistics Data (SBS) from Croatian Bureau of Statistics aggregated by company size (number of employees). SBS data related to population is also checked by detailed insight into companies' activities during the reference year.

The consistency of information coming from questionnaires and administrative sources is assured by cross-checking information from the different data sources.

Data collection will be performed through questionnaires created for this purpose. To ensure data consistency for all segments, together with definition of each variable in guidelines, link is made to accounting code in financial accounts. Some of variables also will be collected from the DoF subsidies register, since it is mandatory for all aquaculture producers in Croatia to report the production in volume and value each year at the farm level. Some of the variables will be taken from questionnaires. Some other variables, e.g. subsidies, will be collected through DoF register and questionnaires. For some segments with small-scale companies it will be necessary to put additional effort in future data collection since they have difficulties in recording financial documents.

Data storage and documentation

Describe how the data is stored.

Provide link to webpage where additional methodological documentation can be found, if any.

Additional methodological information on socio-economic data:

<https://podaci.ribarstvo.hr/metodologija/socioekonomski/>

Revision

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

So far data has not been revised.

Confidentiality

Are procedures for confidential data handling in place and documented?

Yes

Are protocols to enforce confidentiality between DCF partners in place and documented?

NA.

Are protocols to enforce confidentiality with external users in place and documented?

Yes

Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No.

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

There are no deviations from planned methodology.

(Sampling scheme identifier: Socio-economic data for processing / Probability Sample Survey)

Survey Specifications

Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.

Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.

Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.

Sector name(s): Processing

Sampling scheme: Probability Sample Survey

Variables: economic and social variables for processing

Supra region(s): Mediterranean Sea and Black Sea

Survey planning

Survey is performed by MA-DoF according to the Ordinance on the content, form and manner of delivery of socio-economic data in fisheries (OG 79/2020). Respondents are required to submit data by June 1st for the previous year.

As data from the Business Register is not necessarily updated, data from the Register of approved establishments, maintained by Ministry of Agriculture, the Veterinary Directorate, will be taken into account when defining the population for reference years 2022-2024.

Socio-economic data is collected by questionnaire forms; the type of data collection scheme is probability sample survey by stratified random sampling and in some cases a census survey.

Survey design and strategy

Data sources:

There are two main sources of data - some variables will be collected from DoF database and subsidies register while some will be taken from questionnaires. For cross-checking, data from the Croatian Financial Agency (FINA) will be used, which is mostly connected with the financial account, but only for companies who have to deliver their data due to their size category or net profit.

Determination of sample size:

As data from the Business Register is not necessarily updated, data from the Register of approved establishments, maintained by Ministry of Agriculture, the Veterinary Directorate, will be taken into account when defining the population for reference years 2022-2024.

Survey methods and distribution: questionnaire forms by post, by email, on website (national DCF and DoF) and by phone.

Data collection will be conducted by phone contact with subjects, introducing them with the data collection, and sending questionnaires (forms) together with guidelines by post or email. In the case of processing industry, it is not necessary to visit subjects since most companies have an accounting service and have much better data than some aquaculture segments or the small-scale fishing fleet. The exact size of the active population will be determined only after data collection, since all companies that have fish processing as main or as part of their activities will be contacted.

Estimation design

Estimation procedures are performed according to agreed methodologies published on the official DCF web site (<https://datacollection.jrc.ec.europa.eu/docs-links/socio-eco-var>).

In cases where response rate is inadequate to reach a statistically sound estimation, a simple regression is used to cross-check results or estimate totals.

All questionnaires will be checked by DoF employees and all strange or unknown data reviewed. In some cases, respondents need to be asked to clarify some numbers or information they sent. In cases when data collection is not possible directly from a visit, questionnaires will be filled with telephone consultation and send to DoF by e-mail. Also, some data collection can be made through financial accounts and profit and loss accounts. Those financial reports are available for public at FINA.

Error checks

Data on processing industry are regularly checked with data from the Financial agency and starting from 2017 with Structural Business Statistics Data (SBS) from Croatian Bureau of Statistics (CBS) aggregated by company size (number of employees). SBS data related to population is also checked by detailed insight into companies' activities during the reference year.

The consistency of information coming from questionnaires and administrative sources is assured by cross-checking information from the different data sources.

Data collection will be performed through questionnaires created for this purpose. To ensure data consistency for all segments, together with definition of each variable in guidelines, link is made to accounting code in financial accounts.

A new type of questionnaire should provide data that maximum correspond to the actual operation of enterprises in the fish processing industry. Many companies whose main activity is processing, have also many other activities, as well as aquaculture and fishing activities. In this manner, data placed in questionnaires are actually balanced. Data coming from CBS can however only be used in cross-checking procedures since DCF data call deadlines are usually well before the CBS data availability.

Data storage and documentation

Describe how the data is stored.

Provide link to webpage where additional methodological documentation can be found, if any.

Additional methodological information on socio-economic data:

<https://podaci.ribarstvo.hr/metodologija/socioekonomski/>

Revision

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Confidentiality

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Yes

Are protocols to enforce confidentiality between DCF partners in place and documented?

NA.

Are protocols to enforce confidentiality with external users in place and documented?

Yes

Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

No.

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

There are no deviations from planned methodology.