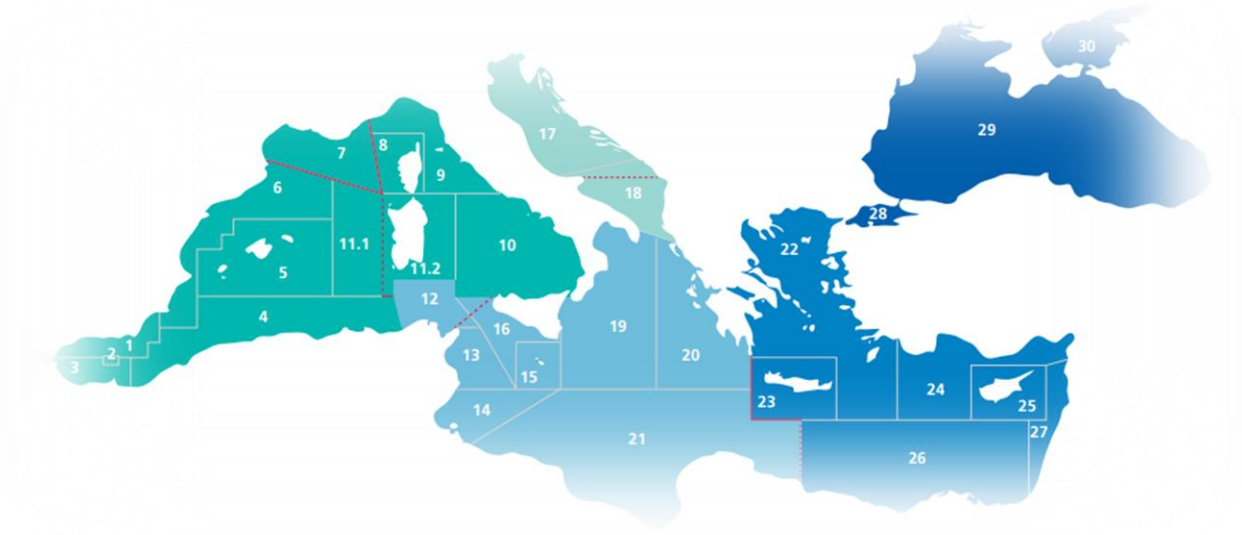
Food and Agriculture Organization of the United Nations

General Fisheries Commission for the Mediterranean
Commission générale des pêches pour la Méditerranée

GFCM DCRF

DATA COLLECTION REFERENCE FRAMEWORK





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GFCM - DCRF
DATA
COLLECTION
REFERENCE
FRAMEWORK

- PART 1 -

Structure of the data collection

- PART 2 -

Common practices in data collection

CONTENTS

Acronyms

- CPCs Contracting parties and cooperating non-contracting parties
- CWP Coordinating Working Party on Fishery Statistics
- DCRF Data Collection Reference Framework
- FAO Food and Agriculture Organization of the United Nations
- FMSY Fishing mortality rate of maximum sustainable yield
- GFCM General Fisheries Commission for the Mediterranean
- GSA Geographical subarea
- ICES International Council for the Exploration of the Sea
- IUCN International Union for the Protection of Nature
- MPA Marine protected area
- MSY Maximum sustainable yield
- RFMO Regional fisheries management organization
- SAC Scientific Advisory Committee in Fisheries
- SC Subcommittee
- SCSA Subcommittee on Stock Assessment
- SCSE Subcommittee on Economics and Social Sciences
- SRC Subregional committee
- TAC Total allowable catch
- WGBS Working Group on the Black Sea

INTRODUCTION

What is the GFCM Data Collection Reference Framework (DCRF)?

The DCRF is the first GFCM comprehensive framework for the collection and transmission of the fisheries-related data that are requested as per existing GFCM Recommendations and are necessary for relevant GFCM subsidiary bodies to formulate advice in accordance with their mandate.

The DCRF is a GFCM instrument, developed by the technical subsidiary bodies responsible for scientific advice, as a concrete response to the need to strengthen the collection and processing of data on fisheries in the GFCM area of application (Mediterranean and Black Sea). It aims to be instrumental in achieving a more efficient data collection programme in the whole region, and to better integrate data collection and subregional multiannual management plans. The DCRF should be regularly reviewed by relevant GFCM subsidiary bodies in light of possible requirements emanating the Commission, including through new recommendations.

Historical background

Performance review and modernization of the GFCM

As all Regional Fisheries Management Organizations (RFMOs) and upon a call made by the United Nations General Assembly and the FAO Committee of Fisheries[1] to review and modernize their mandates, the GFCM undertook its performance review from 2009 to 2010. During the review, the Agreement for the establishment of the General Fisheries Commission for the Mediterranean (GFCM Agreement) was assessed along with the extent to which measures adopted by the GFCM had achieved the objectives of the Commission. A Task Force was established to build upon strengths and address weaknesses identified. Amongst the main topics to be addressed for enhancing a sound and scientifically based decision making process, the need to strengthen data collection systems in the region was prioritised.

Framework programme (FWP) and data collection activities

As an instrument to assist on the actions identified by the Task Force, the Commission established a platform to help strengthen intra-institutional coordination with FAO regional projects and other intergovernmental organizations through multiannual and multidonor arrangements. The GFCM Framework Program (2013-2018) was structured around five work programmes (WP): Governance (WP01), Data collection (WP02), Aquaculture (WP03), Small-scale fisheries (WP04), Subregional cooperation and Technical assistance (WP05).

The development of WP02 since 2013 has entailed a series of coordinated actions with the aim to strengthen data collection systems and to standardize the transmission process. The different national data programmes were assessed and their main characteristics and drawbacks analysed in four sub regional workshops held in 2013 and 2014 in the Mediterranean and Black sea[2] [3] [4] [5].
The main gaps, difficulties, proposals and recommendations that emerged during these workshops were used as a basis to propose possible modifications and/or improvements to GFCM data and information requirements. Three main indications were of general agreement: i) to simplify data aggregation; ii) to clarify variables definitions and iii) to improve online procedures for data transmission by GFCM Contracting Parties and Cooperating non-Contracting Parties (CPCs).

[1] COFI Report on Strengthening regional fisheries management organizations and their performances including the outcomes of the 2007 tuna RFMOs meeting, twenty-seventh session (Rome, 5-9 March 2007)
[2] Report of the Workshop on fisheries data collection and management plans in the Adriatic Sea
[3] Report of the Subregional meeting on data collection for the western, central and eastern Mediterranean
[4] Report of the Workshop on fisheries data collection in the Black Sea
[5] Report of the Workshop on the implementation of the DCRF in the Mediterranean and the Black Sea

The DCRF manual

This manual outlines the DCRF principles by encompassing all the necessary indications for the collection of fisheries data by CPCs and its transmission to the GFCM in a standardized way, in order to empower the relevant GFCM subsidiary bodies with information needed for the formulation of advice.

Preparation

The DCRF manual has been prepared by the GFCM Secretariat under the umbrella of Scientific Advisory Committee on Fisheries (SAC) and taking into account the comments provided by the Working Group on the Black Sea (WGBS), in response to the mandate given by the thirty-eighth session of the Commission (May 2014). It considered GFCM binding decisions in force, as well as SAC and WGBS national reports, stock assessment forms, *ad hoc* questionnaires and other available sources[6].

The manual has been completed thanks to inputs provided by experts on the occasion of several technical meetings held during the intersessional period 2014-2015*:* Working Groups on Stock Assessments of demersal and small pelagic species (GFCM headquarters, November 2014); Workshop on the implementation of the DCRF in the Mediterranean and the Black Sea (Spain, December 2014); Subcommittee on Stock Assessments and Subcommittee on Social and Economic Sciences (GFCM headquarters, February 2015); Working Group on the Black Sea (Turkey, February 2014 and Georgia, March 2015).

The manual is composed of two main parts: *Structure of data collection* and *Common practices in data collection*. The first one was adopted by the sixteenth session of the SAC in March 2014 and was enriched with a practical section (second part) upon the request of the thirty-eighth session of the Commission (GFCM, 2014a).

The DCRF manual was endorsed by the Commission at its thirty-ninth session (Italy, May 2015).

The current version (2021.1) encompasses elements gathered by the GFCM Secretariat in the last years as follow:

- inputs from countries that participated on a voluntary basis in the DCRF pilot study (from October 2015 to October 2016), which was launched with a view to finalizing the online data transmission tools made available through the DCRF online platform;
- comments from the delegates of CPCs who participated in the meeting on GFCM fisheries data requirements (November 2016)[7];
- feedback from CPCs during the first official data transmissions in 2017 and the subsequent ones in 2018, 2019 and 2020 through the DCRF online platform;
- relevant elements from the 2018 and 2019 sessions of the SAC and WGBS.

The manual, and in particular its section dedicated to the biological information in support of the assessment of priority species as identified by GFCM subregions, has been aligned with the mid-term strategy (2017-2020) towards the sustainability of Mediterranean and Black Sea fisheries[8].

Part 1 of the manual has been enriched with relevant information about those GFCM fisheries data requirements implying annual submissions by CPCs which have been part of the so-called "DCRF harmonization process". In parallel, the dedicated Excel-based data-entry tools, including preliminary embedded quality checks, were progressively released and put at disposal to concerned CPCs on the DCRF online platform.

[6] CopeMed, 1999, 2002; Cingolani & Santojanni, 2003; Coppola, 2007; Council Regulation, 2008; Dimech *et al.*, 2012; Pinello & Dimech, 2013; FAO EastMed, 2014

[7] Report of the meeting on GFCM fisheries data requirements

[8] www.fao.org/gfcm/publications/brochures/midtermstrategy-2017-2020

Finally, the chapter on data quality has been then improved with elements deriving from the GFCM survey on fisheries data quality (launched by the GFCM Secretariat in April 2017 to assess the data quality control process carried out at the national level by CPCs) as well as from the application of quality checks to the data transmitted through the DCRF online platform for the reference years 2017 (feasibility phase), 2018 and 2019.

Main characteristics

The DCRF aims at optimizing the GFCM fisheries data collection through:

- clear identification of the main thematic areas of the data collection (defined as "tasks") together with the definition of their purposes in line with the objective of the GFCM[9];
- detailed description of all the data variables;
- simplified level of data aggregation for requested variables (in this regard, the concept of "operational units" has been superseded);
- more flexible and easier fleet segmentation scheme;
- simpler measures of fishing effort;
- new concept of priority species group whereby species are identified at the level of the five GFCM subregions (Western Mediterranean Sea, Central Mediterranean Sea, Adriatic Sea, Eastern Mediterranean Sea and Black Sea);
- well-defined data collection practices;
- improved online data transmission procedures.

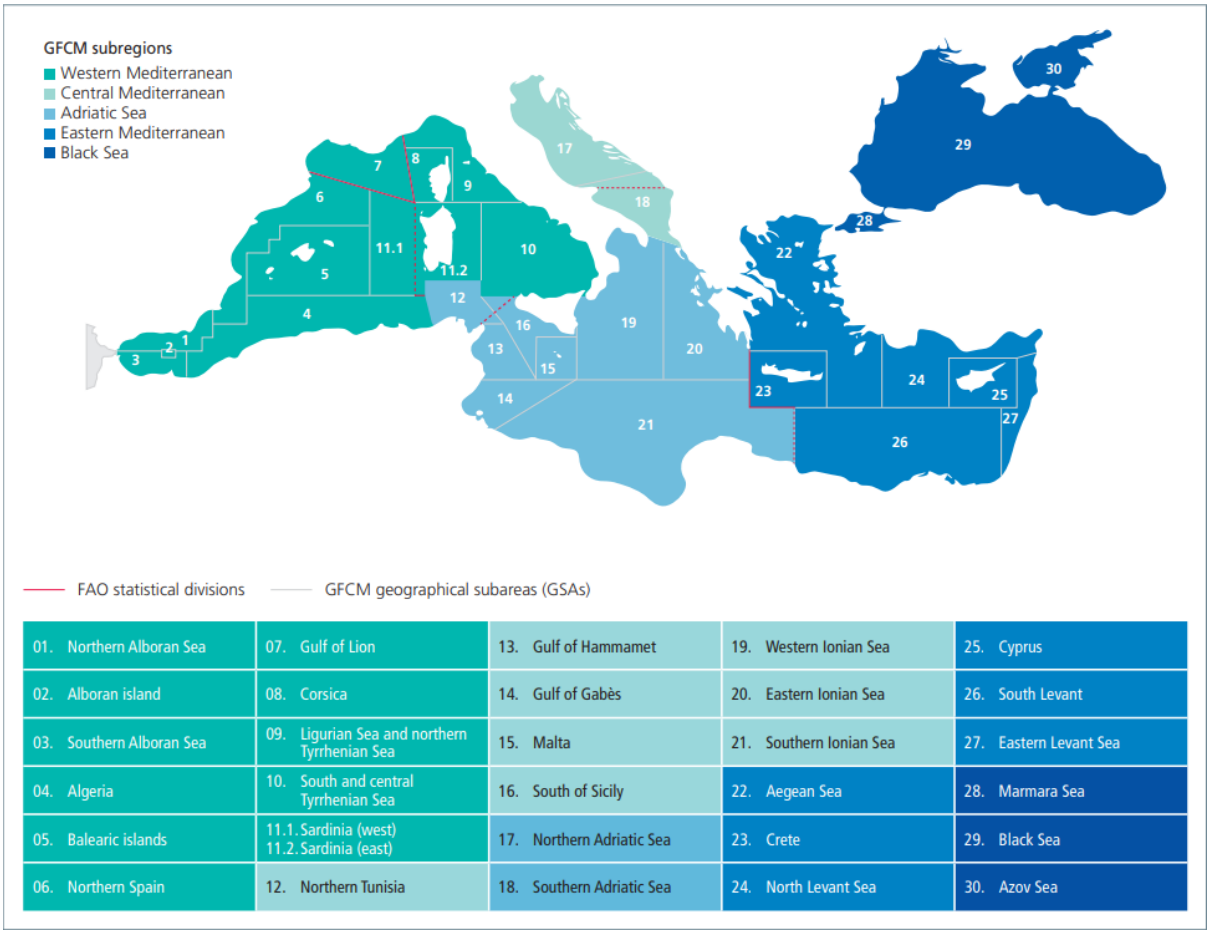
[9] GFCM basic texts (Article 8 of the Amended Agreement for the establishment of the General Fisheries Commission for the Mediterranean, 24 May 2014)

PART 1

STRUCTURE OF THE DATA COLLECTION

Chapter 1 - The need for a Data Collection Reference Framework (DCRF)

The GFCM has the responsibility and authority to oversee the full process of fisheries management, undertake scientific evaluations and take decisions to ensure sustainability of fisheries resources in its area of application (Figure 1 and Appendix L). The collection of data required to achieve an appropriate management of fisheries is crucial and countries should therefore provide their best available information in terms of quality and comprehensiveness.



01. Northern Alboran Sea	07. Gulf of Lion	13. Gulf of Hammamet	19. Western Ionian Sea	25. Cyprus
02. Alboran island	08. Corsica	14. Gulf of Gabès	20. Eastern Ionian Sea	26. South Levant
03. Southern Alboran Sea	09. Ligurian Sea and northern Tyrrhenian Sea	15. Malta	21. Southern Ionian Sea	27. Eastern Levant Sea
04. Algeria	10. South and central Tyrrhenian Sea	16. South of Sicily	22. Aegean Sea	28. Marmara Sea
05. Balearic islands	11.1. Sardinia (west) 11.2. Sardinia (east)	17. Northern Adriatic Sea	23. Crete	29. Black Sea
06. Northern Spain	12. Northern Tunisia	18. Southern Adriatic Sea	24. North Levant Sea	30. Azov Sea

Figure 1: Map of the GFCM area of application
(Subregions and Geographical Subareas)

On basis of the new GFCM Agreement[10] that refers to the "subregional approach to fisheries management and aquaculture development in order to better address the specificities of the Mediterranean and the Black Sea", the concept of subregions has been introduced during the revision process of the fishery data collection framework of GFCM and then reflected into the DCRF manual. As agreed at several GFCM technical meetings held during the intersessional period 2013-2015, the subregional approach answers specific needs in managing the Mediterranean and Black Sea by considering the specificity of each identified area, including its fisheries. The identified five subregions (Western Mediterranean Sea, Central Mediterranean Sea, Adriatic Sea, Eastern Mediterranean Sea and Black Sea) aim at facilitating the integration between data collection and subregional multiannual management plans.

[10] www.fao.org/gfcm/background/legal-framework

The need to establish functional data collection systems in the GFCM area of application has always been a key issue for internal discussion. Many efforts have been made to develop useful tools for the creation of GFCM information systems, associated databases and protocols for data transmission. However, notwithstanding the steps taken since 2010 to encourage and support CPCs to transmit data, the level of compliance still needs to be enhanced. Many datasets have been received in an incomplete state, thus hindering the capacity of the GFCM to use these data to fulfil its mandate.

The rationale behind the design of this framework is to reduce data requirements and encompass them into a single, simple and easy-to-understand manual, providing CPCs with the necessary indications for the collection and transmission of data related to fisheries to the GFCM Secretariat. Moreover, the information gathered should be sufficient and reliable enough to review the status of the different resources, to assess the economic and social dimensions of the fleets and to provide scientific advice on the status of the resources, as well as to allow CPCs to prepare recommendations to manage those resources.

In order to fulfil the GFCM objectives, the data collected within the DCRF encompass area-based information on national fleets and their activities, catch and effort and biological information on main species, including discards and incidental catch of vulnerable species. Socio-economic data is also required in order to assess the economic situation of fishing enterprises and employment trends. Within the DCRF, CPCs should guarantee the quality and completeness of the data at the requested aggregation level and, according to an agreed format, transmit them in a timely manner to the GFCM Secretariat.

The DCRF is based on seven different tasks:

- T1 - Global figures of national fisheries
- T2 - Catch (landing data, catch data per species)
- T3 - Incidental catch of vulnerable species
- T4 - Fishing fleet
- T5 - Fishing effort
- T6 - Socio-economics
- T7 - Biological information (stock assessment input data, length data, other biological data, dolphin fish, red coral, European eel, ecosystem indicators)

Chapter 2 - Components of the DCRF

"It is essential to know exactly what is currently being fished from the wild population, as this affects the stock's ability to survive and, more importantly to reproduce" (FAO, 2002).

This chapter describes basic fisheries data needed for an effective conservation and management of marine living resources in the Mediterranean and Black Sea area, subdivided according to the seven main data components, namely "tasks" identified within the DCRF. Each task, and related subtask (if any), is briefly introduced with a short description. Information is given on the countries concerned, the type of obligation (mandatory and/or optional data) and the requested variables, as well as the frequency of data transmission and the deadline for transmission. For data transmission purposes, information is also provided on the composition of the primary key[11] for each data table.

Structure of each DCRF-Task

- Description
- Countries involved
- Data (mandatory, optional)
- Data confidentiality
- Frequency and deadline of transmission

To gather all the necessary data and information, the GFCM Secretariat has established a deadline reminder through which concerned CPCs are informed by email, on a regular basis, about the upcoming obligations for the transmission of data to GFCM. Full details on parameters, aggregation levels and transmission instructions for each DCRF task together with the reference to the related GFCM recommendation are indicated in the reminder. CPCs should proceed to the timely transmission of their data through the DCRF online platform (Chapter 10 - Data transmission). The datasets gathered by the GFCM Secretariat will then be checked for compliance and quality before their final upload in the GFCM information systems. Data will be made available to experts participating in the GFCM scientific subsidiary bodies (e.g. working groups, subregional committees, SAC and WGBS), according to GFCM data confidentiality policies and procedures. A report on the status of transmitted data (Chapter 8 - Data quality) will be put at the disposal of CPCs in a specific section of the DCRF online platform and the GFCM Secretariat will liaise with CPCs in the event that corrections are needed.

Thereafter, the information will be put at disposal of the relevant GFCM subsidiary bodies for the provision of scientific advice. Also, the GFCM Secretariat will provide, through a biennial report (The State of Mediterranean and Black Sea Fisheries - SoMFi), a regular overview on the status of national/regional fisheries based on the information received through the DCRF online platform.

In developing information systems to collect, validate, analyse and disseminate data and information, the GFCM Secretariat pays particular attention to international codifications and standards (e.g. fishing gear, species, fishing areas), also in line with the work carried out by the Coordinating Working Party on Fishery Statistics (CWP), as well as to all aspects related to data security and confidentiality (Resolution GFCM/35/2011/2).

The DCRF manual assists countries to collect the minimum sets of information required to assess the status of their fisheries and the status of the main stocks, to manage their own resources and to comply with the GFCM requirements. In this regard, classifications of priority species have been made by taking into account different criteria, such as abundance, economic value and conservation status (Appendix A). The list of priority species (Groups 1, 2 and 3) is subject to regular update upon decisions taken by relevant GFCM subsidiary bodies and final approval by the Commission at its annual session.

[11] A primary key is a data field or combination of data fields with values that uniquely identify each data row in a table (DCRF task or subtask). Such combinations of data fields can occur only once in each table and cannot contain null values.

The fisheries data requirements which are reported in the DCRF manual, together with their main purposes and their relation to existing GFCM decisions are detailed in Table 1.

Data can be transmitted separately for each DCRF task, according to the data transmission calendar (Appendix O).

Table 1 - GFCM-DCRF tasks: data and purposes

DCRF TASKS AND SUBTASKS			DATA	PURPOSES	RELATED RECOMMENDATIONS
TASK		SUBTASK			
I	**GLOBAL FIGURES OF NATIONAL FISHERIES**	**-**	Annual data on total landing, number of active fishing vessels, total capacity and total engine power by country	General overview of the fishery in each country with indication of capacity and total landings	Rec. GFCM/41/2017/6
II	**CATCH**	**II.1 / Landing data**	Annual data on total national captures (i.e. landing) by country, GSA and fleet segment	Monitoring the total annual biomass landed by fleet segment, country and area	Rec. GFCM/41/2017/6
		II.2 / Catch data per species	Annual data on total catch (i.e. landing and discards) for the main commercial species reported by country, GSA and fleet segment	Monitoring the trend of total catches (landing and discards) of the main commercial species	Rec. GFCM/41/2017/6
		II.3.1 / Fishing activities - Alboran Sea (blackspot seabream)	Annual data related to fishing activities (i.e. number of exploitation days, exploitation area and catches) by country, GSA, fishing gear and fleet segment	Monitoring the annual catch of blackspot seabream in the context of multiannual management plan for the sustainable exploitation of the species in the Alboran Sea (GSAs 1 to 3)	Rec. GFCM/43/2019/2
		II3.2 / Fishing activities - Black Sea (turbot)	Annual data on fishing activities (i.e. operating days, operating area and total catch) reported by country, GSA, fishing gear and fleet segment	Monitoring the exploitation of turbot in the context of multiannual management plan for turbot fisheries in the Black Sea (GSA 29)	Rec. GFCM/41/2017/4
		II.3.3 / Fishing activities - Ionian Sea (trawl fisheries)	Annual data related to fishing activities (i.e. operating days, operating area and total catch) reported by country and vessel	Monitoring the annual exploitation of Giant red shrimp and Blue and red shrimp in the context of multiannual management plan for sustainable trawling fishing activities in the Ionian Sea (GSAs 19 to 21)	Rec. GFCM/42/2018/4
		II.3.4 / Fishing activities - Levant Sea (trawl fisheries)	Annual data on fishing activities (i.e. exploitation days and area, catches) for Giant red shrimp and Blue and red shrimp in the Levant Sea reported by country and vessel	Monitoring the annual exploitation of Giant red shrimp and Blue and red shrimp in the context of multiannual management plan for sustainable trawling fishing activities in the Levant Sea (GSAs 19 to 21)	Rec. GFCM/42/2018/3
		II.3.5 / Fishing activities - Strait of Sicily (demersal)	Annual data on fishing activities (i.e. exploitation days and area, catches and discards) for European hake and deep-water rose shrimp in the Strait of Sicily reported by country, GSA, and fleet segment	Monitoring the annual exploitation of European hake and of deep-water rose shrimp in the context of multiannual management plan for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (GSAs 12 to 16)	Rec. GFCM/42/2018/5

DCRF TASKS AND SUBTASKS			DATA	PURPOSES	RELATED RECOMMENDATIONS
TASK		SUBTASK			
II	CATCH	**II.4.1 / Landing points - Adriatic Sea (demersal)**	Information related to the landing points of demersal stocks reported by country and GSA	Monitoring the landing points for European hake, Norway lobster, Common sole, Deep-water rose shrimp and Red mullet in the context of a multiannual management plan for sustainable demersal fisheries in the Adriatic Sea (GSAs 17 and 18)	Rec. GFCM/43/2019/5
		II.4.2 / Landing points - Black Sea (turbot)	Information related to the landing points of Turbot reported by country and GSA	Monitoring the landing points for Turbot in the context of a multiannual management plan for turbot fisheries in the Black Sea (GSA 29)	Rec. GFCM/41/2017/4
		II.4.3 / Landing points - Ionian Sea (trawl fisheries)	Information related to the landing points of key species reported by country and GSA	Monitoring the landing points for Giant red shrimp and Blue and red shrimp in the context of a multiannual management plan for sustainable trawl fisheries in the Ionian Sea (GSAs 19 to 21)	Rec. GFCM/42/2018/4
		II.4.4 / Landing points - Jabuka Pomo Pit	Information related to the landing points of demersal reported by country	Monitoring the landing points for demersal stocks in the context of the establishment of a fisheries restricted area in the Jabuka/Pomo Pit in the Adriatic Sea	REC. GFCM/41/2017/3
		II.4.5 / Landing points - Levant Sea (trawl fisheries)	Information related to the landing points of key species reported by country and GSA	Monitoring the landing points for Giant red shrimp and Blue and red shrimp in the context of multiannual management plan for sustainable trawl fisheries in the Levant Sea (GSAs 24 to 27)	Rec. GFCM/42/2018/3
		II.4.6 / Designated ports - Red coral	Information related to the ports of Red coral reported by country and GSA	Monitoring the authorized ports for red coral in the context of a management plan for the sustainable exploitation of this species in the Mediterranean Sea	Rec. GFCM/ 43/2019/4
		II.4.7 / Landing points - Strait of Sicily (demersal)	Information related to the landing points of demersal species reported by country and GSA	Monitoring the landings points for European hake and/or deep-water rose shrimp in the context of a multiannual management plan for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (GSAs 12 to 16).	Rec. GFCM/42/2018/5

DCRF TASKS AND SUBTASKS			DATA	PURPOSES	RELATED RECOMMENDATIONS
TASK		SUBTASK			
II	**CATCH**	**II.4.8 / Designated ports - Alboran Sea (blackspot seabream)**	Information related to the ports of Blackspot seabream reported by country and GSA	Monitoring the ports for Blackspot seabream in the context of a management plan for the sustainable exploitation of this species seabream in the Alboran Sea (GSAs 1 to 3)	Rec. GFCM/43/2019/2
III	**INCIDENTAL CATCH OF VULNERABLE SPECIES**	**-**	Annual data (i.e. number of individuals) on incidental catch of vulnerable species (i.e. seabirds, sea turtles, marine mammals and shark species) by area, country and fishing gear	Quantification of incidental catches of vulnerable species by fleet segment and assessment of the impact of fisheries on species of conservation concern	Rec. GFCM/41/2017/6
IV	**FISHING FLEET**	**IV.1 / Fishing vessels - LOA≤15 m**	Annual data on register of fishing vessels with identification features (i.e. vessel name, registration number, port, fishing gear, geographical subarea, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) of fleets operating in the GFCM area of application	Monitoring of fishing capacity in the GFCM area of application	Rec. GFCM/33/2009/5
		IV.2 / Fishing vessels - LOA>15 m			Rec. GFCM/33/2009/6
		IV.3 / Fishery Restricted Areas (FRA)			Rec. GFCM/33/2009/5
		IV.4.1 / Authorized vessels - Adriatic Sea (Demersal)	Annual data on vessels actively fishing for demersal species in the Adriatic Sea with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for European hake, Norway lobster, Common sole, Deep-water rose shrimp and Red mullet in the context of a multiannual management plan for sustainable demersal fisheries in the Adriatic Sea (GSAs 17 and 18)	Rec. GFCM/43/2019/5
		IV.4.2 / Authorized vessels - Adriatic Sea (small pelagics)	Annual data on fishing vessels authorized to fish for small pelagic stocks in the Adriatic Sea with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for small pelagics in the context of a multiannual management plan for fisheries exploiting small pelagic stocks in the northern Adriatic Sea (GSA 17) and on transitional conservation measures for fisheries exploiting small pelagic in the southern Adriatic Sea (GSA 18)	Rec. GFCM/37/2013/1

DCRF TASKS AND SUBTASKS			DATA	PURPOSES	RELATED RECOMMENDATIONS
TASK		SUBTASK			
IV	FISHING FLEET	**IV.4.3 / Authorized vessels - Alboran Sea (blackspot seabream)**	Annual data on authorized and operating fishing vessels to catch blackspot seabream with longlines and handlines, with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for blackspot seabream in the context of a management plan for the sustainable exploitation of this species in the Alboran Sea (GSA 1 to 3)	Rec. GFCM/43/2019/2
		IV.4.4 / Fishing vessels - Black Sea (turbot)	Annual data on authorized and operating fishing vessels for turbot in the Black Sea with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for turbot in the context of a multiannual management plan for turbot fisheries in the Black Sea (GSA 29)	Rec. GFCM/41/2017/4
		IV.4.5 / Authorized vessels - Common dolphinfish fisheries	Annual data on fishing vessels authorized to use fish aggregating devices (FADs) for the exploitation of common dolphinfish with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for common dolphinfish in the context of the establishment of a closed season for common dolphinfish fisheries using FADs	Rec. GFCM/43/2019/1
		IV.4.6 / Fishing vessels - Ionian Sea (trawl fisheries)	Annual data on vessels actively fishing for Giant red shrimp and Blue and red shrimp in the Ionian Sea with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for Giant red shrimp and Blue and red shrimp in the context of a multiannual management plan for sustainable trawl fisheries the Ionian Sea (GSAs 19 to 20)	Rec. GFCM/42/2018/4
		IV.4.7 / Fishing vessels - Levant Sea (trawl fisheries)	Annual data on vessels actively fishing for Giant red shrimp and Blue and red shrimp in the Levant Sea with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for Giant red shrimp and Blue and red shrimp in the context of a multiannual management plan for sustainable trawl fisheries in the Levant Sea (GSAs 24 to 27)	Rec. GFCM/42/2018/3

DCRF TASKS AND SUBTASKS			DATA	PURPOSES	RELATED RECOMMENDATIONS
TASK		SUBTASK			
IV	FISHING FLEET	**IV.4.8 / Authorized vessels and fishers - Red coral**	Annual data on fishers and fishing vessels authorized to harvest red coral with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the harvesting of red coral in the context of a management plan for the sustainable exploitation of red coral in the Mediterranean Sea	Rec. GFCM/ 43/2019/4
		IV.4.9 / Fishing vessels - Strait of Sicily (demersal)	Annual data on authorized and operating fishing vessels (bottom trawlers) exploiting demersal stocks in the Strait of Sicily with identification features (i.e. vessel name, registration number, port, fishing gear, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for demersal stocks, including European hake and of deep-water rose shrimp, in the context of multiannual management plan for bottom trawl fisheries exploiting demersal stocks in the Strait of Sicily (GSAs 12 to 16)	Rec. GFCM/42/2018/5
		IV.4.10 / Fishing vessels - Strait of Sicily (shrimps)	Annual data on vessels actively fishing for Giant red shrimp and Blue and red shrimp in the Strait of Sicily with identification features (i.e. vessel name, registration number, port, fishing gear, geographical subarea, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for Giant red shrimp and Blue and red shrimp in the context of a multiannual management plan for sustainable trawl fisheries the Ionian Sea (GSAs 19 to 20)	Rec. GFCM/43/2019/6
		IV.4.11 / Authorized vessels - European eel	Annual data on authorized fishing vessels to fish for European eel with identification features (i.e. vessel name, registration number, port, fishing gear, geographical subarea, etc.) and information on technical features (i.e. gross tonnage, kilowatt, overall length etc.) reported by country	Monitoring the fleet capacity for European eel in the context of a multiannual management plan for European eel in the Mediterranean Sea	Rec. GFCM/42/2018/1
V	FISHING EFFORT	**V.1 / Fishing effort - Fleet segment**	Fishing effort data calculated as a combination of capacity and activity by country, GSA, fleet segment and fishing gear. Information on catch per unit effort (CPUE) for the main commercial species	Accounting for the amount of effort deployed and evaluating fishing pressure and trends in CPUE	Rec. GFCM/41/2017/6
		V.2 / Fishing effort - Fishing gear			
		V.3 / Fishing effort - CPUE			

DCRF TASKS AND SUBTASKS			DATA	PURPOSES	RELATED RECOMMENDATIONS
TASK		SUBTASK			
VI	**SOCIO-ECONOMICS**	**VI.1 / Economic and social data**	Data related to economic and social variables of fishery by country, GSA and fleet segment	Assessing the economic value and social implications of fisheries	Rec. GFCM/41/2017/6
		VI.2 / Operating costs			
		VI.3 / Species value			
		VI.4 / Other economic aspects			
VII	**BIOLOGICAL INFORMATION**	**VII.1 / Stock assessment input data**	Annual data on stock identification and stock biological information on priority species: growth parameters, length/weight relationships, recruitment, biomass. Information on environmental factors that may affect population dynamics	Assessing the status of stocks and provision of scientific advice	Rec. GFCM/41/2017/6
		VII.2 / Length data	Data related to the observed size distribution, in the landing, of identified priority species per GSA	Monitoring the structure of exploited populations	Rec. GFCM/41/2017/6
		VII.3.1 / Size at first maturity	Information on some biological variables (i.e. sex and L50) of identified priority species per GSA	Monitoring the biological rates and dynamics of the exploited species	Rec. GFCM/41/2017/6
		VII.3.2 / Maturity data	Information on some biological variables (i.e. length, sex and maturity) of identified priority species per GSA.	Monitoring the biological rates and dynamics of the exploited species	Rec. GFCM/41/2017/6
		VII.4.1 / Dolphin fish (general information)	Annual data on dolphinfish (i.e. landings and vessels) reported by country, fishing period and GSA	Monitoring the population status of dolphin fish and assessing the effect of seasonal closure on the fishery	Rec. GFCM/30/2006/2
		VII.4.2 / Dolphin fish (statistics)	Annual data on dolphinfish (i.e. GT of vessels, number of FADs, fishing trips, average size of fish caught, transhipments) reported by country and GSA	Monitoring the population status of dolphin fish and assessing the effect of seasonal closure on the fishery	Rec. GFCM/30/2006/2
		VII.5 / Red coral	Information on red coral harvesting, weight, effort, average diameter and depth by country, GSA, statistical grid, landing port and fishing ground	Assessing the status and regulating the exploitation of red coral	Rec. GFCM/ 43/2019/4
		VII.6 / European eel	Annual data on Silver eel, Yellow eel, Silver and yellow eel, and Glass eel (i.e. total catch, fishing days, fishermen) by country, habitats, site, gear type and for the different life stages	Monitoring the status and assessing the level of escapement of European eel	Rec. GFCM/41/2017/6

For the purpose of this framework, the following definitions have been used:

VESSEL GROUP:	Fishing vessels, regardless their size, using the same gear for more than 50 percent of the time at sea during a year.
FLEET SEGMENT:	The combination of a group of fishing vessels of the same size and using the same gear for more than 50 percent of the time at sea during a year[12].
ACTIVE VESSEL:	In terms of its operational status, a vessel is considered active when it executes at least one fishing operation during the reference year in the GFCM area of application.
POLYVALENT VESSELS:	All fishing vessels using more than one gear with a combination of passive and active gear, none of which exceeding more than 50 percent of the time at sea during the reference year.
FISHING GEAR:	Equipment used for fishing (e.g. bottom otter trawls, gillnets, harpoons, longlines, midwater pair trawls, pots, purse seines and traps), according to the international standard classification (FAO, 1980) (Appendix D of this manual).
FISHING TRIP:	In the most simple cases, a fishing vessel leaves the port, steams to the fishing grounds, fishes for a certain time and returns to the port where its catch is landed. The combination of these events is called a "fishing trip" (Sparre, 2000). Generally, in the Mediterranean and the Black Sea, a 24-hour period (i.e. a fishing day), irrespective of the calendar day, is often used as a time unit. During a fishing trip, a fishing vessel may carry out different fishing operations.
FISHING OPERATION:	Any single "action" carried out during a fishing trip whether or not a catch was made. This includes, among others, towing one trawl net, setting a line and hauling pots and traps.
CATCH:	The amount of marine biological resources that are caught by the fishing gear and reach the deck of the fishing vessel. This includes individuals of the target species, which are usually kept on board and retained, as well as bycatch, which refers to species, with or without commercial value, that are not targeted by the fishery.
LANDING:	The part of the catch that is retained on board and brought ashore.[13]
BYCATCH:	The part of the catch that is unintentionally captured during a fishing operation in addition to target species. It may refer to the catch of other commercial species that are landed, commercial species that cannot be landed (e.g. undersized,

[12] In order to define the fleet segments, the GFCM classification currently in force has been slightly modified to accommodate the most recent developments (Appendix B).

[13] In accordance with the landing obligation (as reported in the EU Regulation No 1380/2013), total catch of Mediterranean species which are subject to catch limit and minimum sizes must be landed even if they are not to be commercialized.

damage individuals), non-commercial species, as well as to incidental catch of endangered, vulnerable or rare species (e.g. sea turtles, sharks and marine mammals).

DISCARDS: The part of the catch that is not retained on board and is returned at sea dead or alive. It may include target species or any other species (both commercial and non-commercial) discarded at sea.

VULNERABLE SPECIES: A taxon is considered vulnerable when facing a high risk of extinction in the wild in the medium-term future. For the purpose of this manual (Appendix E), the lists of seabirds, sea turtles, marine mammals and shark species included in Appendix II (endangered or threatened species) and Appendix III (species whose exploitation is regulated) of the Barcelona Convention (Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean) have been used.

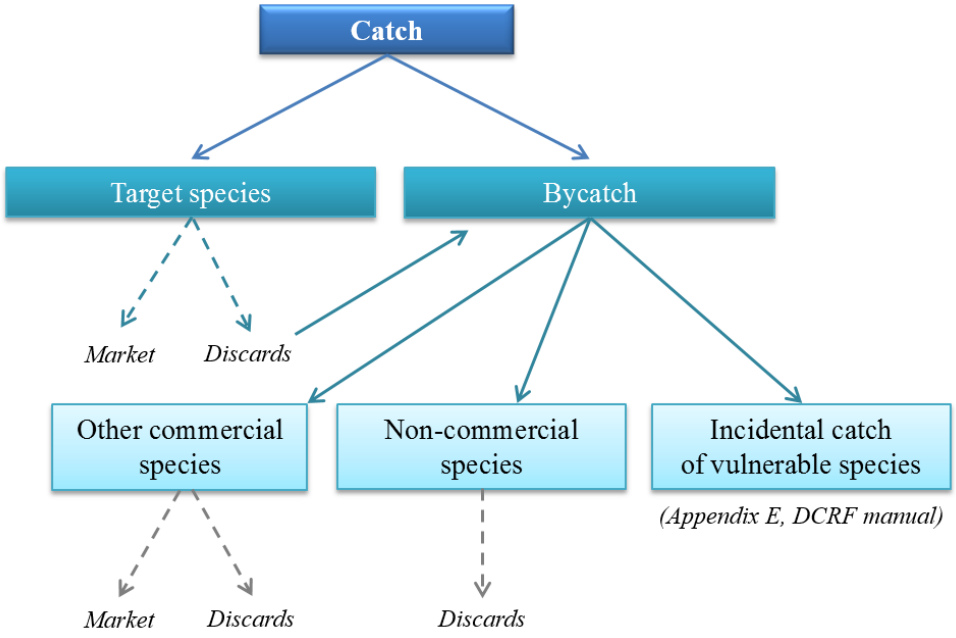


Figure 2: Scheme representing the different components of the catch

The same species can move from one category (i.e. market or discards) to another, depending on size, market demand, season or other criteria. Similarly, other species may be undesirable, or of limited value, in one subregion, but appreciated in others (Figure 2).

2. Task I: Global figures of national fisheries

Description - The objective of this task is to provide a general overview of the fishery in each country, with an indication of total capacity and total landing. Data reported here are totals of some important

variables, and must therefore be in line with the data/information provided through the other tasks and subtasks of the present manual.

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - Countries should transmit information about total amount of landing, in weight, together with the total number of active fishing vessels, the corresponding total capacity (GT) and engine power (kW).

Table I.1 *Global figures of national fisheries*: General overview
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Number of vessels	*The corresponding number of all active fishing vessels operating in the country during the reference year*	
Total landing	*The whole part of the catch that is landed (in tonnes) by all active fishing vessels during the reference year*	
Total capacity (GT)	*The total capacity (sum), in gross tonnage (GT), of all active fishing vessels operating in the country*	
Total engine power (kW)	*The total engine power (sum), in kilowatt (kW), of all active fishing vessels operating in the country*	

** data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 31st May of each calendar year (n). Data requested (Table I.1) are mandatory (Appendix O).

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Table I.1 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

2.1 Task II: Catch

Knowledge of the biomass removed from the ecosystem by fishing operations is fundamental so as to monitor the status of stocks, as well as the impact of fishing on fish populations.

Subtask II.1 - Landing data

Description -This subtask refers to the total amount of landing. The total amount of all landed species, in weight (tonnes) by fleet segment, together with the total number of active fishing vessels, should be reported by country and area (GSA). Total landing figures can be obtained from different sources (e.g. logbooks, sales notes, sampling and interviews).

In order to optimise the sampling, and according to the inputs received by the Subcommittee on Stock Assessment and the Subcommittee on Economic and Social Sciences (GFCM, 2015a, 2015b) fleet segments could be merged (i.e. aggregating length classes) if they:

- have similar exploitation patterns (targeting the same species);
- exploit the same portion of the population (i.e. juveniles or adults).

When a country proposes to aggregate fleet segments, the rationale and corresponding references (e.g. existing scientific studies) should be brought to the attention of the relevant subsidiary bodies, which in turn should confirm the similarity/homogeneity of the combined cells[14]. In the case of merged segments, the code to identify the newly defined fleet segment will be provided by the GFCM Secretariat (section 6.2 Chapter 6).

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - Landing data (in tonnes) and number of active fishing vessels (Table II.1), are requested by fishing area (GSA) and for all fleet segments, as identified in Appendix B.

Table II.1 *Catch*: Total landing data
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Number of vessels	*The corresponding number of all active fishing vessels (by GSA) operating in the identified fleet segment, during the reference year*	
Total landing	*The whole part of the catch (in tonnes) that is landed by the operating fleet segment in the GSA*	

** data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by 30th June of each calendar year (n). Landing data (Table II.1) are mandatory (Appendix O).

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Table II.1 may be made publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

[14] Further information could be found in paragraph 6.2.1 Merging procedures of this manual

Subtask II.2 - Catch data per species

Description - For the main commercial species[15], identified at national level, countries should transmit information on total catch by area (GSA) and fleet segment. Total catch should be considered as the weight of the total yearly catches, including retained catch (landings) and the discarded fraction (discards).

Discards data, if available, should be collected and reported in the corresponding table according to identified fleet segments and commercial species. The collection of discards information (i.e. weight in tonnes for the main commercial species) is only compulsory for fleet segments (e.g. trawlers 12-24 m) for which the discard rate is assessed as significant. The discard rate can be considered as being significant when it exceeds 10 percent of the total volume of catch for a given fleet segment in a given GSA. Should the discard level be assessed as insignificant (<10%), there is no need to collect information on discards for the pertaining segment.

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - Countries should transmit the total catch data (weight), including landing and discards (if present and recorded), by main commercial species, fleet segment (Appendix B) and area (GSA) (Table II.2).

Table II.2 *Catch*: Catch data per species
Mandatory

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Species	*The 3-alpha code identifying the main commercial species[16].*	X
Total landing per species	*The total landing (in tonnes) of the mentioned commercial species for the identified fleet segment in the GSA*	
Total discards per species**	*For the mentioned commercial species, the total volume (in tonnes) of discard by the identified fleet segment in the GSA*	
Total catch per species	*The total catch, landing+discard (in tonnes) of the mentioned species for the operating fleet segment in the GSA. If there is no discard, this field should match that of total landing*	

** if any

** data fields composing the primary key (PK) of the table*

[15] "main commercial species" are currently those which summed up together, represent 90% in weight of total landing in the country.
[16] www.fao.org/fishery/collection/asfis

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 30th June of each calendar year (n) (Appendix O). Countries are encouraged to respect this deadline and provide all requested data. Catch data per species (Table II.2) are mandatory.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Table II.2 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

2.2 Task III: Incidental catch of vulnerable species

Description - This section refers to the specific reporting of incidental catch of seabirds, sea turtles, seals, cetaceans, sharks and rays species (Appendix E.1) as identified in a number of GFCM recommendations (GFCM/35/2011/3, GFCM/35/2011/4, GFCM/35/2011/5, GFCM/36/2012/2 and GFCM/36/2012/3) and included in Annex II (*List of Endangered or Threatened Species*) and Annex III (*List of species whose exploitation is regulated*) of the *Protocol concerning Specially Protected Areas and Biological Diversity SPA/BD in the Mediterranean of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean* (Barcelona Convention). Moreover, any incidental taking of rare sharks and rays (Appendix E.2), even if not mentioned in the Barcelona Convention, should also be reported.

Available information on incidental catches of vulnerable species by fishing gear or fleet segment is still limited. It is therefore important to collect existing data and identify additional/alternative sources of information to guide any possible revision of monitoring schemes. Data regarding the number of individuals taken as well as fleet segments and gear types (if available) should be reported. Suitable methods for recording incidental catch include for example on-board observers and/or self-sampling (Chapter 6).

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - A minimum set of parameters, such as the number of individuals caught per fleet segment (Appendix B) and/or per fishing gear (Appendix D), should be reported. Countries should transmit this information only in the event of incidental catch of vulnerable and rare species (i.e. seabirds, sea turtles, cetaceans, monk seal and sharks), as specified in Table III.1 (Appendix E).
Data should be aggregated by area (GSA) and by species group and/or family, if the detailed information by species is not available (e.g. when individual could not be identified at species or genus level, as in the case of recording seabirds, which include a large number of possible species). It is also important to report the total number of individuals caught, whether they have been released alive, dead or in unknown status.

Table III.1 Incidental catch of vulnerable species
Mandatory data for species listed in Appendix E

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Date	*The date (dd/mm/yyyy) when the vulnerable species have been recorded*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Source of data	*Source of data: **BS** (biological sampling on board, at landing place, at market, self-sampling, others) **SU** (scientific survey) or **OT** (other)*	X
Fleet segment	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Fishing gear**	*The code of the fishing gear, as reported in Appendix D of this manual (e.g. GNS)*	X
Group of vulnerable species	*The name of the group of vulnerable species, as reported in Appendix E of this manual (e.g. Cetaceans)*	X
Family**	*The name of the Family, as reported in Appendix E of this manual (e.g. Delphinidae)*	X
Species**	*The scientific name of the species, as reported in Appendix E of this manual (e.g. Orcinus orca)*	X
Total number of individuals caught	*The total number (sum) of individuals caught (regardless of their release) with that particular gear (or at level of fleet segment if information on the gear is not available) in the GSA*	
Total weight of individuals caught**	*The total weight (tonnes) of individuals caught (regardless of their release) with that particular gear (or at level of fleet segment if information on the gear is not available) in the GSA*	
Number of individuals released alive**	*The number (sum) of individuals caught that have been released alive; (if none enter 0)*	
Number of dead individuals**	*The number (sum) of dead individuals; (if none enter 0)*	
Number of individuals released in unknown status**	*The number (sum) of individuals caught, for which there is no information about status during release (e.g. partially damaged); (if none enter 0)*	

** if available

** data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 31st July of each calendar year (n) (Appendix O).

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Table III.1 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

2.3 Task IV: Fishing fleet

Description - The overall objective of this task is to provide information on the fleet operating in the GFCM area of application, in order to compile reliable statistics on fishing capacity for management purposes at regional and subregional level.

Countries should transmit information about all national vessels, boats, ships or other craft that are equipped and used for commercial fishing purposes in the GFCM area of application. Particular attention should be paid to small-scale vessels.

Data collected under this task will make it possible to obtain:

- an accurate source of statistics for the Mediterranean and Black Sea fishing fleet;
- a complete picture of the regional, subregional, and national fishing capacity;
- a better knowledge at regional/subregional level of the age of fleets (safety indicator);
- a picture of historical events: entry into and exit from the fleet, modifications and characteristics.

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - Data within this task can be grouped into the following categories:

- Administrative (name, port, registration number, etc.)
- Technical (length, tonnage, power, fishing gear etc.)
- Personnel (operator, crew etc.)

The list of mandatory fields is summarized in Table IV.1. Additional information should only be reported for vessels over 15 metres (Table IV.2).

Table IV.1 *Fishing fleet*: Description of vessels
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Registration authority	*Name of the authority that issued the vessel registration*	
Vessel name**	*Name of vessel (in Latin characters)*	
National registration number	*The code representing the official vessel identifier as reported in the national fleet register (alphanumeric string)*	X
Vessel registration number	*The code representing the national registration number of the vessel (ISO 3-alpha code of the country plus 9 digits)*	X
International radio call sign (IRCS)	*If applicable, the international radio call (IRCS) sign of the vessel. This information is compulsory in those cases where the vessel is eligible for obtaining the IRCS due to the presence of on-board radiocommunication devices.*	
Maritime Mobile Service Identity (MMSI)	*If applicable, the Maritime Mobile Service Identity (MMSI) of the vessel. Series of nine digits commonly associated to on-board radio equipment. This information is compulsory in*	

FIELDS	DEFINITION OF VARIABLES	PK*
	those cases where vessel is eligible for obtaining the MMSI due to the presence of on-board radiocommunication devices.	
Operational status (active indicator)	*Active/inactive. Permanent status until receives allowance to return to activity (indicator Y/N)*	
Port of registration	*Full name of the port where the vessel is registered.*	
GSA (main geographical fishing area)	*The GSA where the vessel is authorized to fish and operates the majority of the year (see geographical subarea code as reported in Appendix L of this manual - Res. GFCM/33/2009/2)*	
Secondary fishing statistical area (GSA)**	*The GSA where the vessel is authorized to fish and operates occasionally (Appendix L of this manual)*	
Tertiary fishing statistical area (GSA)**	*The GSA where the vessel is authorized to fish and operates occasionally (Appendix L of this manual)*	
Year of entry into fishing activity**	*The year in which the vessel commenced its fishing activity*	
Authorization to fish (licence indicator)	*Any authorization to fish, e.g. licence, permit or any other official denomination; indicator Y/N*	
Main fishing gear used	*The main gear, according to the fishing licence of the vessel or the owner/operator, using the International Standard Statistical Classification of Fishing Gear (ISSCFG), which was adopted during the 10th Session of the Coordinating Working Party on Fishery Statistics (CWP - Madrid, 22-29 July 1980 - FAO, 1980) (Appendix D of this manual).*	
Secondary fishing gear**	*The secondary gear, according to the fishing licence of the vessel or the owner/operator, using the same International Standard Statistical Classification of Fishing Gear as in "main fishing gear used" (Appendix D of this manual).*	
Third fishing gear**	*The tertiary gear, according to the fishing licence of the vessel or the owner/operator, using the same International Standard Statistical Classification of Fishing Gear as in "main fishing gear used" (Appendix D of this manual).*	
Length Overall (LOA)	*The vessel's Length Overall, in metres, which represents the main longitudinal dimension of the hull of the vessel. This value should be provided with an accuracy of 2 digits*	
Gross tonnage (GT)	*The Gross Tonnage, according to the International Convention on Tonnage Measurement of Ships, London, 1969 (in use since 1996)*	

FIELDS	DEFINITION OF VARIABLES	PK*
Power of the main engine (kW)	*The total maximum continuous rated output power, in kW, of all the vessel's main propulsion machinery, which appears on the vessel's certificate or registry or other official manual, according to the International Convention on Standards of Training, Certification and Watch keeping for Fishing Vessel Personnel (STCW-F)*	
Construction year of vessel	*The year in which the vessel was constructed*	
VMS indicator (presence/absence)	*Indicating whether the vessel is equipped with a VMS device. Enter Yes (Y) or No (N)*	

** if any

** data fields composing the primary key (PK) of the table*

Table IV.2 *Fishing fleet*: Additional information for vessels over 15 metres
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Registration authority	*Name of the authority that issued registration of the vessel*	
Vessel name**	*Name of vessel (in Latin characters)*	
National registration number	*The code representing the official vessel identifier as reported in the national fleet register (alphanumeric string)*	X
Vessel registration number	*The code representing the national registration number of the vessel (ISO 3-alpha code of the country plus 9 digits)*	X
IMO number	*If applicable, the International Maritime Organization (IMO) number as assigned to the vessel by IHS Maritime & Trade. This information is compulsory in those cases where the fishing vessel is eligible under the IMO Ship Identification Number Scheme (Res. GFCM/41/2017/6).*	
Owner (details)	*Details of the owner(s): name and address*	
Operator (if different from owner)**	*Details of the operators(s): name and address*	
Min. number of crew	*The minimum number of crew required to conduct fishing operations during the reference year*	
Max. number of crew	*The number of crew required to conduct a specific fishing operation, if superior to the value of "Min. number of crew"*	

** if any

**data fields composing the primary key (PK) of the table*

In addition, countries whose vessels conduct fishing activities close to Fisheries Restricted Areas (FRAs - Appendix C) should adequately report *ad hoc* information (Table IV.3). Vessels operating in a fishery for which a management plan exist (e.g. as in Recommendation GFCM/36/2013/1) should also comply with the information required in the management plan.

Table IV.3 *Fishing fleet*: Vessels operating in Fisheries Restricted Areas (FRA)
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Registration authority	*Name of the authority that issued registration of the vessel*	
Vessel name**	*Name of vessel (in Latin characters)*	
National registration number	*The code representing the official vessel identifier as reported in the national fleet register (alphanumeric string)*	X
Vessel registration number	*The code representing the national registration number of the vessel (ISO 3-alpha code of the country plus 9 digits)*	X
Fisheries Restricted Area	*Name of the Fisheries Restricted Area as reported in Appendix C of this manual*	
Number of fishing days	*The number of fishing days operated by the vessel in the Fisheries Restricted Area during the year*	
Fishing gear used in the Fisheries Restricted Area	*The fishing gear used to fish in the Fisheries Restricted Area, according to the International Standard Statistical Classification of Fishing Gear (ISSCFG)*	
Period authorized (if applicable) for fishing in the Fisheries Restricted Area**	*Period authorized for fishing in the Fisheries Restricted Area (FRA): from DD/MM/YYYY to DD/MM/YYYY*	

** if any

** data fields composing the primary key (PK) of the table*

Data (Optional) - Countries are also encouraged to provide additional information regarding the equipment of the vessel (refrigeration, navigation, communication, fish processing etc.), even if only one or few optional data fields are available, and to communicate information on its earlier history, if available (previous vessel name and flag state etc.). The full list of optional data fields is included in Table IV.4.

Table IV.4 *Fishing fleet*: Additional vessel equipment information
Optional data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Registration authority	*Name of the authority that issued registration of the vessel*	
Vessel name**	*Name of vessel (in Latin characters)*	
National registration number	*The code representing the official vessel identifier as reported in the national fleet register (alphanumeric string)*	X
Vessel registration number	*The code representing the national registration number of the vessel (ISO 3-alpha code of the country plus 9 digits)*	X
Previous vessel name	*The previous name of the vessel, if applicable*	
Previous flag State	*The previous flag of the vessel, if applicable (refer to the code list at www.fao.org/countryprofiles/iso3list.asp.)*	
Previous details of deletion from other registries	*If applicable, the reason why the vessel was deleted from other registries and moved to the current register*	
Period authorized for fishing and/or trans-shipping	*The time period authorized for fishing and/or trans-shipping*	
Power of auxiliary engine(s) kW	*The total installed engine power not included in the value of "power of the main engine"*	
Hull material	*Enter the hull material of the vessel*	
Powered/motorized	*The value indicating whether the power of the vessel's main engine > 0; indicator Y/N*	
Fish hold capacity (m^3)	*The capacity, in m^3, of the vessel's fish hold*	
Lights for fishing	*The number of lights on the fishing vessel, in the case of fishing operations requiring light*	
Navigation equipment	*Textual description of the type of navigation equipment being reported*	
Communication equipment	*Textual description of the type of communication equipment being reported*	
Fish finder	*Textual description of the type of fish finder equipment being regularly used*	
Deck machinery	*Textual description of the deck machinery used to operate fishing gear, listed according to the vessel on which each item is present and the event being reported*	
Refrigeration equipment	*Textual description of refrigeration equipment being reported*	
Fish processing equipment	*Textual description of fish processing equipment being reported*	
Safety equipment	*Textual description of the main item of safety equipment being reported*	
Period authorized for fishing with demersal trawl gear	*The period authorized for fishing with demersal trawl gear (if applicable): from DD/MM/YYYY to DD/MM/YYYY*	

** if any

** data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1by the 31st May of each calendar year (n) (Appendix O). Data of vessels over 15 metres in overall length should be transmitted as any changes occur, with particular attention to the authorized fishing period,

for which information should be kept updated[17]. Countries are encouraged to respect the deadline and to provide all requested data. Tables IV.1, IV.2 and IV.3 are mandatory. Countries are also invited to provide data as reported in Table IV.4.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Tables IV.1, IV.2, IV.3 and IV.4 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

Exception is made for information related to the owner, operator and crew in Table IV.2, which shall be made available to a restricted audience only, and in accordance with agreed security provisions.

2.4 Task V: Fishing effort

Description - Fishing effort is a measure of the amount of fishing activity deployed. It can be calculated through a combination of inputs related to capacity, gear and time. Effort information is needed to analyse changes in the amount of catch and it is crucial for developing multiannual management plans. Usually, fishing effort is calculated by multiplying the fishing capacity deployed (i.e. total GT or power, number of hooks in longlines) by the period of time (number of hours or days spent fishing) and can be obtained through various sources (logbooks, sampling, census, port surveys, etc.).

Also, effort is combined with catch to estimate the rate of catch per unit effort. The catch per unit of fishing effort (CPUE) is a relative measure of fish stock abundance and can be used to estimate absolute abundance; it could be an indicator of fishing efficiency, both in terms of abundance and economic value. In its basic form, the CPUE could be expressed as the captured biomass for each unit of effort applied to species/stock (e.g. total catch of a species divided by the total fishing: kg/number of fish per longline hook days). Declining trends of this estimator could indicate overexploitation, while unchanging value could indicate sustainable fishing.

For the purpose of this framework, the CPUE should be reported only for the priority species belonging to Group 1 and Group 2 (Appendixes A.1 and A.2 - Priority species). CPUE should be calculated as the ratio between total catch (by gear and species) and the nominal effort (by gear as reported in Appendix F.2): CPUE = total catch/nominal effort.

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - In order to compare and harmonize data at the regional and subregional level, standard effort information is requested both for fishing capacity (e.g. GT, number of hooks) and activity (e.g. fishing days). Effort data (Table V.1) should be reported by GSA and for all fleet segments operating in the country (Appendix B). Countries are also requested to provide estimates of fishing days by fishing gear (Table V.2).

CPUE data (Table V.3) should be reported, by fishing gear and by established nominal effort, for the identified species belonging to Group 1 and Group 2 (Appendixes A.1 and A.2 - Priority species). Mandatory fishing effort measurements are described in Appendix F.

[17] For the purpose of Recommendation GFCM/33/2009/6, vessels larger than 15 metres in overall length not entered into the GFCM Authorized Vessel list are deemed not to be authorized to fish for, retain on board, trans-ship or land species covered by the Commission.

Table V.1 Fishing *effort*: Effort data per fleet segment
Mandatory data

FIELDS		DEFINITION OF VARIABLES	PK*
Country		*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year		*The year to which the collected data refer*	X
GSA		*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment		*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Capacity (by fleet segment)	**Unit**	*The unit of capacity (Appendix F.1 of this manual)*	
	Value	*The total (sum) capacity value per fleet segment in the corresponding GSA*	
Activity (by fleet segment)	**Unit**	*The unit of activity (Appendix F.1 of this manual)*	
	Value	*The total (sum) activity value per fleet segment in the corresponding GSA*	
Nominal effort (by fleet segment)		*The value of the nominal effort per fleet segment, and by GSA, as requested in Appendix F.1 of this manual*	
Number of vessels (by fleet segment)		*The corresponding number of all active fishing vessels (by GSA) operating in the identified fleet segment, during the reference year*	

** data fields composing the primary key (PK) of the table*

Table V.2 Fishing *effort*: Effort data per fishing gear
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fishing gear	*The fishing gear code (Appendix D of this manual)*	X
Fishing days (by fishing gear)	*Total number of fishing days (sum) per fishing gear in the corresponding GSA*	

** data fields composing the primary key (PK) of the table*

Table V.3 Fishing *effort*: CPUE
Mandatory data for species Group 1 and Group 2

FIELDS		DEFINITION OF VARIABLES	PK*
Country		*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year		*The year to which the collected data refer*	X
GSA		*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fishing gear		*The code of the fishing gear (Appendix D of this manual)*	X
Species		*The 3-alpha code identifying the species (Appendix A of this manual)*	X
Capacity (by fishing gear)	Unit	*The unit of capacity (Appendix F.2 of this manual)*	
	Value	*The total (sum) capacity value per fishing gear in the corresponding GSA*	
Activity (by fishing gear)	Unit	*The unit of activity (Appendix F.2 of this manual)*	
	Value	*The total (sum) activity value per fishing gear in the corresponding GSA*	
Nominal effort (by fishing gear)		*The value of the nominal effort per fishing gear, and by GSA, as requested in Appendix F.2 of this manual*	
CPUE		*The CPUE value per species and per fishing gear in the reference year. CPUE should be calculated as the ratio between total catch and nominal effort by gear (as defined in Appendix F.2 of this manual)*	

** data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 30th June of each calendar year (n) (Appendix O). Countries are encouraged to comply with this deadline and to provide all requested data.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Tables V.1, V.2 and V.3 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

2.5 Task VI: Socio-economics

Description - The objective of this task is to collect information in order to monitor the economic status of the fishing sector. Data collected under this task is needed to develop appropriate policies and strategies, especially in relation to promoting the long-term sustainability of resources and fleets.
Economic data can help to explain fisher behaviour and the overexploitation of fisheries resources. The species that fishers target, the level of exploitation, and the gear that they use are all influenced by the benefits they receive (i.e. the revenue) and the costs they incur.

The systematic collection of socio-economic data is necessary so as to assess the economic consequences of different management options on the varying groups, based on the incentives that these create. Economics provide a framework for the optimal allocation of marine resources for the benefit of society. It provides an approach to valuing the different activities, allowing trade-offs between activities to be assessed and impacts to be measured in a consistent manner.

Economic and social information should be collected by area (GSA) and by fleet segment. Countries collecting these data on a yearly basis are requested to transmit them annually (reference year - 2). Biennial transmission is requested for those countries that do not have annual economic surveys in place.

Economic and social data are generally collected through sampling surveys using questionnaires, but for some fleet segments and some variables, other data sources could be used (e.g. administrative records, auction sales, and census).
Data collected under this task will help to obtain:

- trends in economic performance and social indicators;
- time series analysis of average annual prices for commercial species;
- analysis of the profitability of fleets (income, gross value added, operating cash flow);
- an accurate source of statistical data for landing values and prices;
- a better knowledge of fleet costs and their breakdown in different categories;
- a complete picture of regional, subregional and national employment in the fishery sector.

Exhaustive definitions of concepts related to capital value and costs as well as methodologies for calculating these variables have been detailed in various reports (Franquesa *et al.*, 2001; IREPA, 2006) and workshops (WS on calculating capital value using PIM - Perpetual Inventory Method - and definition of EU-DCF variables. Anonymous, 2011 - see section 5.2 Chapter 5).

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - The list of data fields and related definitions is reported in Table VI.1, Table VI.2 and Table VI.3. All types of information should refer to one single year of activity. Data are requested by fishing area (GSA) and fleet segment (Appendix B).

Table VI.1 includes data related to capacity, number of active fishing vessels, total landing values and total days at sea. Information on personnel costs, fuel consumption and price, and other operating costs should be reported in Table VI.2.

Table VI.3 requires reporting information on volume and value of landing by commercial species. Data on prices, income and costs should be reported in national currency.

Table VI.1 data are mandatory and based on annual transmission. Tables VI.2 and VI.3 data are mandatory and should be transmitted on a biennial basis. Biennial transmission should only take place for those countries that do not have annual economic surveys in place. Countries collecting these data on a yearly basis are requested to transmit them annually (keeping reference year - 2).

Table VI.1 Socio-economics: *Economic and social data*
Mandatory data (on annual basis)

FIELDS		DEFINITION OF VARIABLES	PK*
Country		*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year		*The year to which the collected data refer*	X
GSA		*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment		*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Capacity (gross tonnage)		*The total capacity, expressed as gross tonnage (GT), of all active fishing vessels[18] belonging to that fleet segment*	
Capacity (engine power)		*The total capacity, expressed as engine power (kW), of all active fishing vessels[14] belonging to that fleet segment*	
Number of vessels		*The corresponding number of all active fishing vessels (by GSA) operating in the identified fleet segment, during the reference year*	
Total landing	**Currency**	*The currency (Euro or US dollar) in which the total value of landing is reported*	
	Value	*The total value of landing of all active fishing vessels belonging to that fleet segment*	
Total days at sea		*The total number of fishing days carried out by all active fishing vessels classified in that fleet segment*	

** data fields composing the primary key (PK) of the table*

Table VI.2 Socio-economics: *Operating costs*
Mandatory data (on biennial basis)
Biennial transmission should only take place for those countries that do not have annual economic surveys in place. Countries collecting these data on a yearly basis are requested to transmit them annually (reference year - 2)

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Number of vessels	*The corresponding number of all active fishing vessels (by GSA) operating in the identified fleet segment, during the reference year*	
Personnel costs	*Crew wages, including social security costs and imputed value of unpaid labour (for example, the vessel owner's own labour)*	
Fuel consumption**	*Consumption in litres of fuel (regardless of fuel type)*	

[18] A fishing vessel is considered active according to the criteria defined in Appendix B (first footnote).

FIELDS	DEFINITION OF VARIABLES	PK*
Fuel price**	*Average price of fuel over the reference year (regardless of fuel type) in local currency per litre*	
Total fuel cost**	*Total amount paid for fuel in local currency. These data should be transmitted if no data for "Fuel consumption" or "Fuel price" are available*	
Repair and maintenance costs	*Costs for maintenance and repairs of fishing equipment, gear and vessel parts*	
Commercial costs	*Costs related to sales of vessel output. This includes fish market or wholesaler's fees, transportation of production, purchasing of ice, boxes and packaging*	
Other variable costs	*All purchased inputs (good and services) related directly or indirectly to fishing effort (for example, bait, food consumed during the fishing operation) plus the purchase of components of assets (gear or vessel), but only if these do not improve the lifetime of the asset itself (consumed within the given year)*	
Capital costs	*Depreciation costs plus Opportunity costs.* • *Depreciation costs: consumption of fixed capital; this represents the reduction in value of the fixed assets used in production during the accounting period resulting from physical deterioration, normal obsolescence or normal accidental damage.* • *Opportunity costs: the capital value is related to the opportunity cost of capital, or the required rate of return that is the rate of return that a company would otherwise be able to earn at the same risk level as the investment that has been selected. The opportunity cost of production is the value of the firm's best alternative use of its resources.*	
Value of physical capital	*Value of the vessel, i.e., the hull, engine, all on board equipment and gear. The capital stock must be valued at the prices of the current year and should be depreciated*	
Fixed costs	*The costs not directly connected with the operational activities (i.e. effort and catch/landing), which could include bookkeeping, vessel insurance, legal and/or bank expenses, annual quota for fishers' associations, dock expenses, renewal of fishing licences, etc.*	
Employment	*The number of persons working on the active fishing vessels, both on a part-time and full-time basis*	
Currency	*The currency (Euro or US dollar) in which the operating costs are reported*	

** if available

** data fields composing the primary key (PK) of the table*

Table VI.3 Socio-economics: *Species value*

Mandatory data for species Group 1 and Group 2 (on biennial basis)

Biennial transmission should only take place for those countries that do not have annual economic surveys in place. Countries collecting these data on a yearly basis are requested to transmit them annually (reference year n-2)

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Number of vessels	*The corresponding number of all active fishing vessels (by GSA) operating in the identified fleet segment, during the reference year*	
Species	*The 3-alpha code identifying the species (Appendix A of this manual)*	X
Total landing volume	*The total landing (tonnes) of the species mentioned for that fleet segment*	
Total landing value	*The total value of the landing (currency unit, for example, euro), for the species mentioned, of all active fishing vessels belonging to that fleet segment*	
Prices by commercial species	*The average value of species' prices during the reference year*	
Currency	*The currency (Euro or US dollar) in which the species value is reported*	

** data fields composing the primary key (PK) of the table*

Data (Optional) - Countries are encouraged to provide additional information regarding socioeconomic aspects, such as operating subsidies, number of people involved in the crew and divided by age, investments in physical capital, even if only one or few optional data fields are available. The full list of optional data fields is summarized in Table VI.4. Data requested in Table VI.4 are optional and may be transmitted on a biennial basis.

Table VI.4 Socio-economics: *Other economic aspects*

Optional data (on biennial basis)

Biennial transmission should only take place for those countries that do not have annual economic surveys in place. Countries collecting these data on a yearly basis are requested to transmit them annually (reference year n-2)

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Fleet segment	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Operating subsidies	*Includes direct payments, e.g. compensation for halting fishing, refunds of fuel duty or similar lump sum compensation payments.* *Excludes social benefit payments, indirect subsidies, e.g. reduced duty on inputs such as fuel, investment subsidies*	
Investments in physical capital	*Improvements to existing vessel/gear during the given year. These investments aim to improve the lifetime of the assets and are not consumed within the given year*	
Other income	*Includes other income from use of the vessel, e.g. recreational fishing, tourism, oil rig duty, etc. Also, insurance payments for damage/loss of gear/vessel*	
Full-time equivalent (FTE)	*Full-time equivalent employment, which equals the number of full-time equivalent jobs, is defined as total hours worked divided by the average annual number of hours worked in full-time jobs*	
Number of persons in the crew < 25 years-old	*For that fleet segment, the total number of persons in the crew who are younger than 25*	
Number of persons in the crew 25-40 years-old	*For that fleet segment, the total number of persons in the crew who are between 25 and 40 years-old*	
Number of persons in the crew > 40 years-old	*For that fleet segment, the total number of persons in the crew who are older than 40*	
Currency	*The currency (Euro or US dollar) in which these economic aspects are reported*	

** data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1, as requested in Table VI.1, by the 30th November of each calendar year (n) (Appendix O). Information in Tables VI.2, VI.3 and VI.4, pertaining to year n-2, should be transmitted on a biennial basis by the 31st May of each calendar year (n).

Biennial transmission is foreseen for countries that do not have annual economic surveys in place. Countries that collect such information on a yearly basis are requested to transmit these data (Tables VI.2, VI.3 and VI.4) annually, always considering year n-2. The following table summarizes the two possible transmission scenarios, annual and biennial, together with the data reference year(s):

YEAR OF TRANSMISSION	DATA REFERENCE YEAR(S) FOR TABLES VI.2, VI.3 AND VI.4	
	ANNUAL TRANSMISSION	BIENNIAL TRANSMISSION
2018	2016	2016
2019	2017	-
2020	2018	2017 and 2018
2021	2019	-
2022	2020	2019 and 2020
2023	2021	-
2024	2022	2021 and 2022
[…]	[…]	[…]

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Tables VI.1, VI.2, VI.3 and VI.4 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

2.6 Task VII: Biological information

Subtask VII.1 - Stock assessment input data

Description - Stock assessments are based on models of population dynamics requiring three primary categories of information: catch, abundance and biology (e.g. growth, size at first maturity and size at recruitment). All data needed to run these models and to analyse their results must be transmitted using the stock assessment forms.

Regular fish stock assessments provide fisheries managers with reliable figures for sound decision-making regarding stock management. Conservation and management measures should be based on the best scientific advice produced by the relevant subsidiary bodies. The main task of SAC and the WGBS is assessing the status of (major) stocks exploited in the GFCM area of application. It is therefore fundamental to have timely provision by countries of relevant and accurate data concerning inputs (fleets, efforts) and outputs (catches, including discards). For this purpose, SAC, taking into account the comments from the WGBS, has developed standard forms Stock Assessment Form (SAF) and procedures to present data and results on stock assessment in the Mediterranean and Black Sea.

On a yearly basis, SAC and the WGBS will identify those species/stocks that should be assessed and for which stock assessment form should be provided.

Relevant GFCM subsidiary bodies have identified a series of criteria for the selection of the stocks for which assessments should be carried out on a yearly basis (GFCM, 2015a). Some of these criteria are of a scientific nature while others are of economic or social importance. The list of criteria is reported below:

- Commercial importance.
- Shared stocks.
- Data availability.
- Social significance (sector of the fleet and or the workforce involved).
- Problematic assessment in previous years with indications of possible solutions by the WGs.
- Ecological aspects (e.g. most discarded species, species belonging to a relevant trophic level, unbalanced population, competing species, low fecundity species that are most vulnerable such as sharks and rays).

- Stability *vs.* fluctuating trends in the time series. Those stocks presenting quite stable dynamics can be assessed every two or three years, while most fluctuating ones (short lived species) should be assessed annually.
- Frequency of assessments. Priority should be given to stocks never or poorly assessed before.
- Stocks that are subject to a management plan that is existing or in the process of being developed.
- Species that can be representative of the exploitation pattern for the whole fishery.

Countries whose fisheries are based on the same stock (i.e. shared stocks) are encouraged to transmit a single stock assessment form. According to the SAC glossary, shared stocks[19] are the "stocks fished by two or more countries". The list of identified shared stocks is reported in Appendix I (GFCM, 2006).

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - All information required to perform stock assessment should be transmitted by countries through the SAF[20]. It includes catches, fishing gear, a short description of the fleet, historical trends and biological parameters of growth and maturity, as well as a series of reference points (i.e. F, SSB etc.).

Frequency and deadline of transmission - Countries should transmit the stock assessment form, pertaining to year n-1, by the 30th September of each calendar year (n) (Appendix O). The date of data transmission will be linked to the scheduling of the GFCM stock assessment working groups and therefore may differ from year to year.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information under Subtask VII.1 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

Subtask VII.2 - Length data

Description - Length data refer to the observed size frequency of fish, measured according to a given biological sampling plan. The scope of this subtask is to investigate the length distribution of the main commercial species (Appendix A - Groups 1, 2 and 3) by area and fleet segment. Samples might derive (i.e. source of data) from fishery-dependent data (observers on board, observers at landing place, at market or from any other fishery sampling programme) and/or fishery-independent data sources (experimental scientific surveys). When samples come from fishery-dependent data, only the commercial fraction should be reported. Measurements (see section 6.3.1) should be reported within size class intervals of one centimetre or half centimetre for fish (including elasmobranchs) and cephalopods. Size classes of one millimetre should be used for crustaceans. A different level of size aggregation could be requested by relevant subsidiary bodies through the stock assessment forms. For sampling purposes, the three groups of priority species (Appendix A) should be considered. Countries are requested to collect length data for all the species identified in all GFCM subregions where their fisheries take place. Exceptions can be applied according to the criteria reported in section 6.3.

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - For all the species selected in Group 1, Group 2 and Group 3 (Appendix A), a minimum set of parameters, including the sampled number of individuals per different length class by

[19] In the Mediterranean, although the importance of shared fishery resources is widely recognized, the list of priority shared fishery stocks would require a more in-depth analysis, both in terms of consistency and homogeneity, as discussed during the 31st session of the GFCM (GFCM, 2007).

[20] www.fao.org/gfcm/data/reporting/stockassessment

fleet segment (Appendix B), should be reported (Table VII.2). The mean individual weight by length class should be also reported. The computation of the total weight of the individuals in the sample, per fleet segment and length class, can require an estimate through appropriate length-weight regression equation.

Table VII.2 *Biological information*: Length data
Mandatory data for species Group 1, Group 2 and Group 3

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Source of data	*Source of data: **BS** (biological sampling on board, at landing place, at market, self-sampling, others) or **SU** (scientific survey)*	X
Name of the scientific survey* **	*Full name of the scientific survey. If more than one survey is in place, this line should be repeated*	X
Fleet segment**	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Species	*The 3-alpha code identifying the species (Appendix A of this manual)*	X
Length	*The value of the length class of the measured individuals. Length classes should be reported in centimetres (cm), as a whole number, or in half centimetres (e.g. 0.5, 1.0, 1.5 cm, etc.) for fish (including elasmobranchs) and cephalopods. For crustaceans, length classes should be reported in millimetres (e.g. 1, 2, 3, 4 mm, etc.) (see section 6.3.1)*	X
Number of individuals sampled (per length classes)	*The total number (n) of individuals measured for that fleet segment and length class for the reference year*	
Weight of individuals sampled (per length classes)	*Mean individual weight (kg) by length class for that fleet segment and for the reference year*	
Number of individuals expanded (per length classes)	*The total number of individuals, for a given length class, expanded to the total production (e.g. landing) of each fleet segment.* *In case of an experimental survey, it should be expanded to the total catch of that survey*	

** only if from fishery-dependent data
*** if any

**data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 31st July of each calendar year (n) (Appendix O). Length data (Table VII.2) are mandatory for all the species identified in the priority list of species (Appendix A). Exceptions can be applied according to the criteria reported in section 6.3. Countries are encouraged to comply with this deadline and provide all requested data.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific

provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Table VII.2 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

Subtask VII.3 - Other biological data

Description - The objective of this subtask is to monitor and investigate the population dynamics of the most important species in the different subregions. The following variables, for at least the Group 1 species identified and listed in Appendix A, should be reported:

- length at first maturity at species level;
- individual information on maturity state;
- individual information on sex.

Samples may be collected during fishery independent surveys (if more than one survey is in place, countries should provide both data) and/or obtained from observers on board and/or at landing place, or in any other fishery sampling programme. Age data are not explicitly requested in this subtask, but should be transmitted through stock assessment forms as appropriate.

Countries involved - This task is addressed to all countries operating in the GFCM area of application.

Data (Mandatory) - The length at first maturity (L_{50}) is conventionally the size at which 50 percent of the population attains an advanced stage of gonad development. The mentioned parameter is a species-specific value that could be influenced by environmental factors (i.e. temperature, food availability) and by population (i.e. density) factors. The data needed to estimate the size at first maturity can be obtained by calculating the percentage of mature individuals per size-class (number of mature individuals/total number per size-class). The number of individuals in each size-class must be sufficient (at least a minimum of 20 per size-class) and the individuals must be collected in the period just before, or very close to, the spawning peak of the species.

Countries should provide the GFCM Secretariat with the values (Table VII.3.1) of the size at first maturity (L_{50}), for the species belonging to Group 1 (Appendix A.1). If the size at first maturity is not estimated through sampling but taken from literature, countries should provide all references. If available (optional), countries are encouraged to provide these data also for species belonging to Groups 2 and 3.

Only for the priority species identified in Group 1, countries should provide the GFCM Secretariat also with the number of fish individuals measured by sex and maturity (Table VII.3.2) and per the identified fleet segment (Appendix B). Exceptions can be applied according to the criteria reported in section 6.3.

Table VII.3.1 *Biological information*: Size at first maturity
Mandatory data for species Group 1

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Species	*The 3-alpha code identifying the species (Appendix A of this manual)*	X
Sex	*The code for the sex: **M** (Male), **F** (Female**) F+M** (sex combined)*	X
L_{50}	*The size at first maturity (L_{50} - length at which 50% of the fish are mature), for that species*	
Reference**	*If the size at first maturity is not estimated through sampling but taken from literature, enter the complete bibliographic reference. If available, please enter reference data also for Group 2 and Group 3 species.*	

** if any

** data fields composing the primary key (PK) of the table*

Table VII.3.2 *Biological information*: Maturity data
Mandatory data for species Group 1

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Source of data	*Source of data: **BS** (biological sampling on board, at landing place, at market, self-sampling, others) or **SU** (scientific survey)*	X
Name of the scientific survey* **	*Full name of the scientific survey. If more than one survey is in place, this line should be repeated*	X
Fleet segment**	*The fleet segment code (Appendix B of this manual) or the code corresponding to the merged fleet segments (see section 6.2)*	X
Species	*The 3-alpha code identifying the species (Appendix A of this manual)*	X
Length	*Value of the length class of the measured individuals. Length classes should be reported in centimetres (cm), as a whole number, or in half centimetres (e.g. 0.5, 1.0, 1.5 cm etc.) for fish (including elasmobranchs) and cephalopods. For crustaceans, length classes should be reported in millimetres (e.g. 1, 2, 3, 4 mm, etc.). (see section 6.3.1)*	X
Sex	*The code for the sex of sampled individuals: **M** (Male), **F** (Female) **U** (Undetermined), **ND** (Not Determined)*	X
Maturity	*The corresponding maturity stage, as reported in Appendix G of this manual*	X
Number of individuals sampled (per length class, sex and maturity stage)	*The total number (n) of individuals measured per fleet segment, length class, sex and maturity stages for the reference year*	
Weight of individuals sampled (per length class, sex and maturity stage)	*Mean individual weight (kg) by length class for that fleet segment and for the reference year*	
Number of individuals expanded (per length class, sex and maturity stage)	*The total number of individuals per length class, sex and maturity, expanded to the total production (e.g. landing) of each fleet segment. In case of an experimental survey, it should be expanded to the total catch of that survey*	

** only if from fishery-dependent data
*** if any

**data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 31st July of each calendar year (n) (Appendix O). Data requested in Tables VII.3.1 and VII.3.2 are mandatory only for species identified in the Group 1 list (Appendix A.1). If available, countries are encouraged to also transmit data for all other species identified in the priority list of Group 2 and Group 3 species (Appendixes A.2 and A.3). Countries are encouraged to comply with this deadline and provide all requested data.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Tables VII.3.1 and VII.3.2 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

Subtask VII.4 - Dolphin fish

Description - The objective of this task is to collect information on fishing activities related to dolphin fish (*Coryphaena hyppurus)*. Dolphin fish is an epipelagic species living in open waters, but which also approaches the coast, following ships and gathering in small groups below floating objects. Commonly, fishing Aggregation Devices (FADs) are used to concentrate dolphin fish before the nets are set. This is a traditional fishery, particularly for the western-central Mediterranean.

Countries involved - This task is addressed to Italy, Libya, Malta, Spain and Tunisia.

Data (Mandatory) - Countries should communicate to the GFCM Secretariat data on the year, fishing period, GSAs of fishing operation, total landing and number of active fishing vessels involved (Table VII.4.1).

Table VII.4.1 *Dolphin fish*: General information
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
Fishing period	*The starting (1-12) and the ending month (1-12) of the fishing period*	X
GSA	*The geographical subarea code, of the fishing operation, as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Total landing	*The total landing (sum in tonnes) of the dolphin fish in the GSA.*	
Number of vessels	*The corresponding number of all active fishing vessels (by GSA) involved in the fishery of dolphin fish during the reference year*	

**data fields composing the primary key (PK) of the table*

Data (Optional) - Countries are encouraged to provide additional information by GSA, even if only one or few optional data fields are available on aspects related to the dolphin fish fishery. In order to better monitor the total effort, countries should possibly communicate the FADs that were visited and where no fish was found as well as the FADs that were visited and where net was deployed. The full list of optional data fields is included in Table VII.4.2.

Table VII.4.2 *Dolphin fish*: Dolphin fish statistics
Optional data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code, of the fishing operation, as reported in Appendix L of this manual (Res. GFCM/33/2009/2)*	X
Total GT of vessels	*Total (sum) gross tonnage (GT), of the active fishing vessels involved in the fishery of dolphin fish*	
Length range of vessels (m)	*The minimum length (in meter) and the maximum length (in meter) of the active fishing vessels involved in the fishery of dolphin fish*	
Average length of vessels (m)	*Value of the mean length (m) for the active fishing vessels involved in the fishery of dolphin fish*	
Total number of FADs	*Total number (sum) of FADs employed during the reference year*	
Total number of fishing trips	*Total number (sum) of trips carried out during the reference year*	
Number of FADs targeted per fishing trip	*Average value of FADs fished per fishing trip where a net was deployed to catch aggregated fish*	
Number of FADs visited per fishing trip	*Average value of FADs visited per fishing trip, including both FADs which were visited but where no dolphin fish were found and FADs where a net was deployed to catch aggregated fish*	
Average size of fish caught during the fishing season	*Average size (in cm) of dolphin fish caught during the reference period*	
Total transhipments	*If present, the weight (tonnes) value of total trans-shipment occurred during the reference year*	
System of collection and treatment of catch and effort data	*"Yes" or "No" if in the country exists any system of collection and treatment of catch and effort data*	

**data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 31st July of each calendar year (n) (Appendix O). Collection for data present in Table VII.4.1 is mandatory. However, if additional data are collected, countries are invited to provide these in Table VII.4.2.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Tables VII.4.1 and VII.4.2 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

Subtask VII.5 - Red coral

Description - The GFCM has engaged in several initiatives to improve knowledge on red coral (*Corallium rubrum*) with the aim of developing a regional management plan. As a result, the Recommendation GFCM/43/2019/4 involving data transmission by countries harvesting red coral was issued.

Catch and effort data, by fishing ground, statistical grid[21] (Appendix M) and depth are presented together with their definitions in Table VII.5. Other information on red coral (e.g. biological data) from research projects should be requested through a stock assessment form when an assessment is being performed.

For the purpose of this framework, and for red coral only, the following definitions apply:

- *Fishing ground* - The name of the "area" to be provided in the harvest table. This refers to a distinct identifier, such as a national code or name designated by local authorities, or to a practical common sense designation to describe a distinct area where harvest takes place.
- *Population* - This refers to a set of patches that are not isolated from each other (i.e. larvae can be carried by the currents from one patch to another in a few days). For practical purposes, this can also be identified as a "bank". A fishing ground, in the sense defined above, can be constituted by more than one population.
- *Colony* - A coral colony refers to what we see as one coral. This is one whole "tree". It is actually a colony of many small white polyps. Polyps are individuals because they can be removed and grow a new colony through asexual reproduction (i.e. coral "tree"). Each coral starts as one larva that metamorphoses into a first polyp and then multiplies, building the whole colony. There are male and female polyps/colonies which reproduce sexually to create new larvae that settle and create a new coral.

Countries involved - This task is addressed to Algeria, Croatia, France, Greece, Italy, Morocco, Spain and Tunisia.

Data (Mandatory*)* - Total weight (kg), effort (days at sea), average diameter (mm) of the colonies (branch diameter measured at 1 cm above the base) as well as the percentage of the total weight which corresponds to colonies smaller than 7 mm in diameter recorded in the fishing ground are mandatory (Table VII.5). Data should be reported by GSA, statistical grid (Appendix M) and fishing ground.

[21] www.fao.org/gfcm/data/maps/grid

Table VII.5 Red coral: *Harvest*
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer*	X
GSA	*The geographical subarea code as reported in Appendix L of thiss manual (Res. GFCM/33/2009/2)*	X
Statistical grid	*The statistical grid code*[22] *as per Appendix M of this manual (Rec. GFCM/35/2011/1)*	X
Fishing ground (name)	*The name of the "fishing ground" as an alphanumeric string. This can be a name or a national code that identifies the specific area where the catches occur. This name should be assigned by the country.*	X
Name of landing port	*The name of the authorized port where red coral catches from the reported fishing ground are landed*	X
Effort (number of days)	*Number of days at sea (with or without harvesting)*	
Depth (exact or range in m)	*The exact depth (meter) of the dive at which the harvest took place, if available. If unavailable, a range (minimum and maximum depths) for the several dives of the season in the reported fishing ground.*	
Total weight	*The total number of kg (sum) harvested in the reported fishing ground*	
Percentage (%) in weight of undersize colonies	*Percentage of the total weight of undersize colonies recorded in the fishing ground that correspond to colonies with less than 7 mm diameter (measured at 1 cm of the base)*	
Average diameter (mm)	*Average diameter of the colonies referred to the weight recorded for the reported fishing ground*	

**data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data (Table VII.5) pertaining to year n-1 by the 30th June of each calendar year (n) (Appendix O). Countries are also invited to provide data relating to the biology of red coral (through a specific stock assessment form), if an assessment is being performed.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once received by the GFCM Secretariat, all information contained in Table VII.5 may be made available to an external audience following the specific criteria approved by the Commission (Chapter 9).

Subtask VII.6 - European eel

Description - The objective of this task is to collect information on fishing activities related to European eel (*Anguilla Anguilla*). The European eel is distributed across the majority of coastal countries in Europe and North Africa, with its southern limit in Mauritania (30°N) and its northern limit situated in the Barents Sea (72°N), and spanning all of the Mediterranean basin. The newly hatched *leptocephalus* larvae drift with the ocean currents to the continental shelf of Europe and North Africa where they metamorphose into glass eels and enter continental waters. The growth stage, known as "yellow eel",

[22] www.fao.org/gfcm/data/maps/grid

may take place in marine, brackish (transitional), or fresh waters. Once the maturing stage of "silver eel" is reached, the individuals then migrate to the Sargasso Sea where they spawn and die after spawning, an act not yet witnessed in the wild (ICES, 2014). Fisheries (e.g. fixed traps, fixed and mobile net gear, and rod and line - Appendix H.2) exploit the phase recruiting to continental waters (glass eel), the immature growth phase (yellow eel) and the maturing phase (silver eel). The exploited life stage and the gear types employed vary between local habitat, river, country and international regions (Appendix H.1). Eel's data should be reported at country level.

Detailed information on eel (i.e. biological data, growth parameters) should be reported through a stock assessment form when an assessment is being performed.

Countries involved - This task is addressed to Albania, Algeria, Croatia, France, Egypt, Greece, Israel, Italy, Libya, Montenegro, Morocco, Spain, Syria, Tunisia, and Turkey.

Data (Mandatory) - Countries should transmit to the GFCM Secretariat, for each site and gear type, their data on the reference year, habitat (Appendix H.1), gear types (Appendix H.2), total catch per life stages, fishing days carried out by each gear as well as a the estimated effort (Table VII.6).

Table VII.6 *Eel*: General information
Mandatory data

FIELDS	DEFINITION OF VARIABLES	PK*
Country	*The ISO 3-alpha code of the country under which the vessel is operating (refer to the FAO country codes list)*	X
Reference year	*The year to which the collected data refer.*	X
Habitat	*The code of the habitat where at a given life stage (i.e. yellow, glass, silver) eels are fished (Appendix H.1 of this manual).*	X
Site	*The name of the "site". This can be a name or a national code that identifies the specific area where the catches occur. This name should be assigned by the country.*	X
Gear types	*The code of the gear (Appendix H.2 of this manual) used to fish eel.*	X
Mesh size	*The smaller mesh size of the gear used (only in the case of nets)*	
Number of fishermen	*Number of fishermen using the reported gear type targeting only eel in the reported site.*	
Fishing days	*The total annual number (sum) of fishing days by gear type.*	
Average number of "gear units" per day per fisherman	*The daily average of gear units by fisherman. Gear units depend on the gear types (Appendix H.2 of this manual). It could refers to the number of fyke nets, number of hooks, length of nets, etc.*	
Total catch of silver eel	*The total catch (kg) of eels at the silver life-stage for the reported gear type*	
Total catch of yellow eel	*The total catch (kg) of eels at the yellow life-stage for the reported gear type.*	
Total catch of silver and yellow eel	*The total catch (kg) of eels at the silver and yellow life-stage for the reported gear type.*	
Total catch of glass eel	*The total catch (kg) of eels at the glass eel life stage for the reported gear type.*	
Stocking lifestage	*The code of the life-stage (Appendix H.3 of this manual) of the released stock.*	
Stocking (kg/year)	*The total biomass (Kg/year) of the released stock.*	

**data fields composing the primary key (PK) of the table*

Frequency and deadline of transmission - Countries should transmit the data pertaining to year n-1 by the 30st September of each calendar year (n) (Appendix O). Data requested in Table VII.6 are mandatory.

Data confidentiality - Data transmitted by countries will be treated in accordance with all necessary measures to comply with the GFCM security and confidentiality provisions, and with the specific provisions of related recommendations (see Table 1). Once transmitted to the GFCM, all the information in Table VII.6 may be publicly available, in conformity with the criteria of data access policy approved by the Commission (Chapter 9).

Subtask VII.7 - Ecosystem indicators

Description - Indicators on the effects of fishing on marine communities are essential to support an ecosystem approach to fisheries management and to monitor the impact of fishing activities on the environment as well as the status of exploited fish stocks.

Taking into account the proposal made by the SAC at its sixteenth session (GFCM, 2014d), the following set of common indicators to monitor fisheries resources in the Mediterranean areas was selected:

1) Spawning stock biomass
2) Total landings
3) Fishing mortality
4) Fishing effort[23]
5) CPUE (or LPUE as a *proxy*)
6) Incidental catch of vulnerable and non-target species

Those indicators were proposed bearing in mind the feasibility of collecting associated data, including from fishery-dependent or fishery-independent sources. In general, these could be considered as common indicators throughout the GFCM area of application. Technical work will investigate the methodology to estimate the various indicators proposed, assess their performance as well as their aggregation at the regional and subregional level. It is expected that once the SAC have a clear description of each indicator, they will be incorporated in the DCRF manual.

[23] Those indicators have been agreed upon during the GFCM Scientific Advisory Committee on Fisheries (SAC) at its seventeenth session (GFCM, 2015c).

PART 2

COMMON PRACTICES IN DATA COLLECTION

Introduction

The DCRF is the framework of the GFCM subsidiary bodies for the collection and transmission of the fisheries-related data, as per existing GFCM Recommendations. These data are necessary for the provision of advice in support of decision making. Data collection is crucial to achieve appropriate fisheries management in the GFCM area of application. Countries should therefore provide their best available information in terms of quality and comprehensiveness. The DCRF aims to provide countries with all useful indications for the collection of fisheries data in a standardized way.

The fisheries data collection (FAO, 1999; Sparre, 2000) can be defined as the record of measures of one or more variables from members of a population (e.g. recording the number of trips from a population of fishing vessels).

Regarding sources, the methods for collecting useful information to assess the status of the resources can be derived from the following categories:

fishery-dependent data
: are data obtained from commercial fisheries. There are a variety of approaches for obtaining fishery-dependent data. These consist, for example, of sampling catches and effort at landing sites. Related socio-economic information (i.e. fuel, general costs of fishing trips) and biological information (i.e. species, length) can also be obtained through the use of on board observers, self-reporting, logbooks, sale notes, telephone surveys and/or other sources.

fishery-independent data
: are data obtained from scientific surveys. Surveys are designed to develop unbiased estimate (e.g. indices of abundance) which are independent from commercial fisheries. Since data from surveys are not influenced by specific management measures (e.g. mesh size, limits on number of hooks, seasonal closures), or socio-economic factors, they provided an unbiased image of the fishery.

The collection and accurate interpretation of both fisheries-dependent and independent data are of fundamental importance to understanding the status of exploited resources. Both types of methods should be combined, in order to gain a more accurate picture of the status of resources.

Chapter 3 - Sampling overview

Ideally, in any data collection, all members of a population should be measured. This is hardly feasible, and generally, there is a need to do some kind of sampling. Depending on the different size of the population to be measured, there are two basic data collection methods:

- by *census* (where all members of the whole population are measured);
- by *sampling* (where only a portion of members of the whole population is measured).

Fishery *census* is normally conducted by making a complete record of data from all individuals in the target population. The key advantage of a census is that the estimates are known with certainty. The main disadvantage is the considerable cost involved in collection (e.g. the cost of collecting/interviewing every fisher to obtain data would be prohibitive) and the subsequent compilation of all the data collected. This is generally beyond the budget of most fisheries research centres. For example, the use of a logbook to record fisheries data could be considered as a census, since it (theoretically) requires all vessels that meet certain characteristics to provide the required data. A successful logbook scheme should provide information on quantities of fish retained for landing (per species), fishing effort, landing per unit effort, fishing strategies and details of fishing vessels. The success of a logbook scheme as a census approach will partly depend on the attitudes of those compiling it and on the quality of the data that it may contain.

In a *sampling* procedure, the sample must be representative of the target population as a whole. The key advantage of the sample survey is that the amount of data to be collected and analysed is smaller than in the case of a census. Disadvantages of this system are that samples may not be fully representative, as well as problems of accuracy.

The most common groups of sampling procedures are random sampling and stratified sampling:

- *Random sampling* - this type of sampling involves a selection process in which each member of the population has an equal and independent chance of being selected. In random sampling, there is effectively no control over the sampling probabilities.

- *Stratified sampling* - in this type of sampling, not every member of a population has an equal chance (greater than zero) of being included in the sample. This type of sampling is less likely to produce representative samples than random sampling. In stratified sampling schemes, individuals can be selected on an opportunistic, or on an *ad hoc* basis.

When individuals are selected randomly within strata that have been previously defined, the procedure is called *stratified random sampling*. This system is commonly applied to fisheries.

Before designing a sampling strategy, whatever the sampling procedure, it is important to identify the target population (as a whole), the subset to be measured (i.e. the sample) and the nature of its individual members - the sampling units. The target population, the observable subset (sample) and the assumed link between them should be clearly identified. The sample size - the number *n* of sampling units to be included in a sample - must be estimated according to several criteria (e.g. cost, precision level, confidence level, variability within the population and availability of resources). However, as a rule of thumb, the sample size should be as large as possible, given the staff and resources available. In the case of a fishing fleet, the target population would comprise all the vessels in the fleet, but the observable population might only consist of those vessels which, for example, are accessible in nearby ports. Assuming that the unobserved part of the fleet behaves in the same way as the observed part, it would require a raising factor to convert sample estimates to the population of interest. For biological studies, the population of interest could be all fish in the stock. But the observable population might be restricted to the accessible part of total landings from that stock.

There is no single prescription for the optimum design of a data collection scheme. Generally, it is not feasible to design a perfect sampling strategy for all fisheries, because the underlying conditions may vary from place to place and between fisheries. In light of this, some degree of flexibility (e.g. adoption of alternative approaches) must be a key component of any strategy. The availability and capacities of human resources may vary and the data collection schemes should thus be designed to meet existing needs. Taking all these considerations into account, the data collection strategy might, over time, move from a census to a sampling approach (or *vice versa*), as knowledge develops and requirements or resources change.

Steps in data collection

1) *Define the variables of interest to be collected (e.g. landing, effort, catch, biological and/or economic data etc.).*
2) *Define the population.*
3) *Evaluate existing data sources in relation to the programme objectives.*
4) *Evaluate accessibility of the data.*
5) *Evaluate cost-effectiveness and operational considerations (institutional, financial and human resources).*
6) *Collecting data:*
    - *a) by census;*
    - *b) by sampling;*
        - *b.1) stratified sampling;*
            - *define the sample strata (e.g. fleet segment);*
            - *define the sample unit (e.g. vessel, fishing trip);*
            - *define the stratification criteria and scale (e.g. temporal, geographical);*
            - *define the optimum sample size in each stratum (e.g. how many sample units must be collected in each stratum?).*
        - *b.2) random sampling (random selection of a number of elements from the population as whole, or from each stratum in the stratified random procedure).*
7) *Provide an indicator of quality as estimated from the information collected.*

Another challenge is that the information provided is widely acknowledged as scientifically valid. Particular attention should be placed on acquiring the most reliable information in order to avoid a perception that collected data are of poor quality, and, by extension, that scientific and management advice based on such data is weak too. Appropriate statistical procedures must be applied to estimate the allowable margin of error. In the GFCM context, countries are responsible of data quality and should ensure the accuracy, minimum bias and completeness of the data transmitted.

Countries are expected to:

- develop statistically robust sampling design methods, with the minimum degree of associated error;
- identify strata that are representative of the population and capable of providing sufficient data for the required population;
- take into account temporal (e.g. monthly/quarterly) and spatial (e.g. GSA) segregation.

Chapter 4 - Acquisition of landing and effort data

Landing is usually considered as the amount (weight) of the catch harvested from the sea and brought ashore. Fishing effort is the amount of time and fishing capacity (e.g. GT) used to harvest fish. Effort measurements therefore allow an estimation of the pressure placed by fishing activities on fish stocks.

Landing and effort data may come from different sources and are usually derived from a combination of catch reports, logbooks, observers, market and/or landing survey or landing statistics from port authorities. They can be measured and classified by species, area, fishing gear used, and other factors, and can be collected during the same sampling process, or independently from each other.

Monitoring, both landing and effort, is fundamental to evaluate the performance of a fishery. This information, which could be also coupled with information on fish prices (Chapter 5), will make possible to keep track of the growth of a fishing fleet, evaluating changes in the status of the resources and performing basic analysis of the economic performance of fishing vessels.

Wherever possible, landing and effort data should be collected in an exhaustive way. A census approach would be ideal. However, in many cases, due to budget and human constraints, and due to the fact that in the region there are a very large number of fishing vessels landing their catches in a large number of small landing places, an appropriate sampling system is required (Sparre, 2000; Stamatopoulos, 2002; ICES, 2008).

For the collection of the requested data, the target population should comprise all the vessels, which in most countries could be derived from the fleet register on a yearly basis. Once the population is identified, it can be split and aggregated into homogeneous sampling strata (e.g. fleet segments), on the basis of fishing activity (e.g. trawlers, polyvalent), and of other similar physical characteristics (e.g. total length), as well as of geographical location (i.e. GSA). Within a country or subregion for example, the combination of industrial (i.e. trawlers) and artisanal fisheries plays an important role in sampling design, each having its own characteristics, its own relative importance and its own potential for the supply of data. A trawler may land once every two/three days, while a purse seiner with a small net may land every day, with a combination of species/individuals that is greater than that of a small vessel operating with artisanal gear (i.e. gillnet, trammel net) in the coastal zone. The sample units (i.e. vessels) are then selected randomly (or under some statistical criteria) within each of the stratum identified.

Furthermore, collecting and reporting fisheries statistics (i.e. landing and effort) from different countries and institutions generate a great variety of formats and contents of reported data (e.g. different units of measurement, the definition of statistical areas, the degree of coverage of the data collection system and other important measures). For example, the effort is routinely measured in units of time and/or amount of gear used, but alternative definitions exist, depending on the nature of the fishing unit (e.g. fishing vessel, gear) and the amount of resources expended by that unit. For this reason information should be collected in the most harmonized way. That is one of the purposes of this manual, which recommends that effort data be reported according to the variables and aggregation levels as reported in Appendix F (by fleet segment - Appendix F.1, and by gear - Appendix F.2).

A major shortcoming in using landing data is also the species misidentification. Accurate species identification is one of the most important and difficult aspects of fishery-dependent sampling and is crucial to good fishery management. For many fisheries, however, estimating species-specific landings and the associated uncertainty can be difficult, especially in the case of complex multispecies fisheries: many groups of species (e.g. cephalopods and sharks, but also fish species) are difficult to identify and there are many species still awaiting formal scientific description. In some countries/areas, these difficulties in species identification have led to aggregated data simply being recorded as “sharks” or “Mullidae” or “Cephalopods”. Every effort should be made to ensure that the total landing of the commercial species is correctly identified and reported at species level. Moreover, it is important to use the FAO three-alpha code and, where requested, the Latin binomial (i.e. scientific name), genus and species, in order to avoid any confusion between local names.

Chapter 5 - Acquisition of socio-economic data

The aim of a systematic collection of socio-economic data is to calculate appropriate fisheries indicators, so as to assess the economic and social aspects of fisheries and to evaluate the effects of management measures. The list of socio-economic variables (Task VI) considered in this manual allows the calculation of the most often used and efficient indicators. In general terms, socio-economic data can be collected through a census or a sample survey (Chapter 3). When considering the methodologies used in the collection and compilation of economic data, it is essential to bear in mind the wide variation in the structure of the fishing "industries" in the region. In particular, in the Mediterranean and Black Sea, there are a large number of fishing vessels operating as individual small enterprises, or small fishery enterprises managed at family level, while the fleets organized as large or medium enterprises represent a smaller share in terms of the number of units. In these cases, collection of accurate socio-economic data can be difficult, because access to primary data is fragmented and not structured in well-organized accounting systems. The typology of fishing enterprises also affects data collection methodologies, because in most cases the primary source of information is represented by *ad hoc* questionnaires and not by official balance sheets.

5.1 Data on revenues, expenditures, employment, prices by species and investments

Due to the structure of the Mediterranean and Black Sea fisheries, an appropriate sampling system has to be preferred to a census approach. The sampling survey (e.g. through questionnaires) may provide representative data that can be extended to the population as a whole.

A range of sampling methods could be employed to improve the likelihood that the sample is representative, although a risk always remains that the sample estimates are biased (e.g. the sample could be different in some way to the target population as a whole). However, as the standard error decreases with sample size, statistical techniques can assist in determining the optimal sampling sizes for a desired level of precision and confidence (Sabatella & Franquesa, 2004).

The use of a stratified random sample approach reduces the potential for sample bias, but requires additional information on the target population prior to sample selection. Where the complete sample for particular fleet segments cannot be achieved due to non-response, bias can be reduced by assigning weights to the individual sample responses, so as to rebalance the data. The potential bias arising directly from non-response can be reduced through the replacement of the non-responding boats by boats with similar characteristics, on the assumption that the similar boat is as representative as the boat that failed to respond (Sabatella & Franquesa, 2004).

Data on expenditures include crew wages (e.g. social security costs), energy costs (e.g. total energy costs of the vessel, obtained by multiplying the average annual costs of fuel per litre by the total amount of litres used), and other variable costs (e.g. production shipping, purchase of ice, purchase of boxes etc.).

Employment data refer to full-time equivalent (FTE - see section 5.3) and total employment (i.e. number of jobs on board, equal to the average number of persons working for and paid by the vessel).

Price by species can be considered as the value of landed products calculated on the basis of the ex-vessel (first sale) price of the products by target species. Investments relate to any improvement made to existing vessel/gear during the reference year.

5.2 Capital value and capital costs

Capital value is the sum of all assets (or liabilities) presented on the annual balance sheet. The capital value of the fishing firms considered for the scope of the DCRF comprises the following components:

- Fixed tangible assets - sea-based = vessel, engine, electronics, other equipment on board.
- Fixed tangible assets - shore based = buildings, cars and other facilities on shore.

The value of intangible assets (licences, quota, permits, etc.) plays an important role in operational decisions of fishing companies. However, this value is often difficult to estimate and it has therefore been excluded from this manual.

The estimation of capital value and capital costs should preferably follow the Perpetual Inventory Method (PIM), which is the most important international standard for valuation of tangible capital goods. This method has been exhaustively described by the OECD and is used by national statistical offices and the Farm Accounting Data Network in agriculture (Anonymous, 2011).

PIM proposes to determine the aggregated value of the tangible capital goods used in the current year by aggregating the value of all vintages (year classes). Such aggregation can be based either on historical, current or constant prices. Once the value of the capital goods in a given benchmark year has been determined, the capital value of each subsequent year is calculated by adding investments of that year (gross capital formation), revaluing the existing stock and subtracting the value of capital goods taken out of operation. The capital costs (depreciation and interest) are then calculated using an agreed depreciation schedule and interest rate.

Detailed descriptions of the methodologies to calculate the perpetual inventory method (PIM) are reported in *The Workshop on Calculating Capital Value Using PIM and Definition of DCF variables* (Anonymous, 2011).

The price per capacity unit is the main item for the entire valuation of Gross Capital Stock in fisheries. Its determination requires careful interpretation of the information collected on values of vessels and, if necessary, its adaptation. First, it is important to determine which value indicators can be reliably observed and collected. In principle, three or four types of observable value indicators exist:

- Historic prices, i.e. prices currently paid for newly constructed vessels.
- Second hand prices, i.e. prices currently paid for used vessels.
- Insurance premiums, which are based on insurance values, so insurance values can be derived from them.
- Insurance values, collected, for example, from company administrations or insurance companies.
- Book value as presented on the balance sheets (IREPA, 2006).

5.3 Full-time equivalent

Full-time equivalent (FTE) or “Full-time equivalent employment”, which equals the number of full-time equivalent jobs, is defined as total hours worked divided by the average annual number of hours worked in full-time jobs.

Assuming a full-time fishing year of 2000 hours (as in agriculture), labour input below this level should be considered as part-time. However, standard working time may vary by country and by economic activity or even by region. This means that different standard working times (thresholds) could be applied to different fisheries (country and fleet segments) in order to calculate FTE.

Chapter 6 - Acquisition of biological data

In order to obtain a complete overview of the fishery it is also necessary to monitor some biological variables of living resources (e.g. length distribution, age, weight, sex and maturity). Biological features of the individuals provide demographic information that is crucial for the assessment of stocks, which form the cornerstones of fishery management. For example, information on maturity affords an important understanding of biology and reproduction for initial management purposes and enables the separation of estimates of abundance into values representing the immature and mature populations; age provides a basis for estimating growth and mortality year-class strength variation. Therefore, it is crucial that this information is collected in a standardized and homogenous way.

Since sampling all fleet segments and all commercially important species could be difficult, biological data should only be reported for the major fleet segments and for the major group of species identified at the subregional level (Appendix A and section 6.3). The most important fleet segments can be identified and defined according to the procedure described in section 6.2.2.

6.1 Sampling from different data sources

As mentioned previously, the methods for collecting useful information on biological variables could be subdivided into fishery-dependent and fishery-independent data sources. Fishery-independent data collection from scientific surveys is not always possible: in some countries for example, due to their high costs, annual surveys are not carried out on a regular basis. On the other hand, fishery-dependent sources are more common. Each of these options has positive and negative aspects and the decision on whether to use any of these usually depends on different factors - such as the number of vessels in the fishery, the length of fishing trips, the type of required data and funding available to support data collection. A combination of two or more methods (e.g. sampling on board + at landing) is usually required for an adequate data collection.

In the case of biological variables, sampling strata are still represented by fleet segments, but the sampling unit is the fishing trip, which in the Mediterranean and the Black Sea, is equivalent in most cases to a fishing day (one fishing trip = one fishing day). The fishing trip duration is the time elapsed from the moment when the vessel leaves the port until the moment when it returns to the port. The basic assumption is that when a fishing trip includes more than one fishing day, it should be broken down into fishing days (see also scheme below). This assumption is necessary in order to harmonize data and results between fleet segments, countries and years.

Example of conversion of fishing trips into fishing days for a given vessel. The last row reports the total number of fishing days.

	Country 1	Country 2	Country 3
Number of fishing trips per year	60	125	50
Number of fishing days per fishing trip	2	1	3
Total number of fishing days during the year	120	125	150

Ideally, the number of fishing trips to be sampled defined in proportion to the fishing effort (e.g. number of days at sea for each fleet segment) of the previous year(s). The minimum number of fishing days to be sampled should be at least one fishing day per month during the fishing season.

Biological data sources

(a) Sampling at landing/market places (fishery-dependent data)

(b) Sampling on commercial vessel (fishery-dependent data)

(c) Self-sampling (fishery-dependent data)

(d) Sampling on research vessel for experimental or/and scientific survey (fishery-independent data)

(a) Sampling at landing/market places

The collection of information through fisheries observer programmes at market/landing places is one of the most common methods used worldwide to collect biological data, species composition, etc. This is the preferred means of gaining accurate and in-depth data, although in most cases this may be restricted by a requirement to purchase fish. During sampling, it may be possible to collect a variety of information, including fishing location and depth, type and amount of gear used, species identification and biological samples (i.e. length and weight). As reported in section 6.1, for the collection of biological data, the sampling unit is often linked to a fishing day/trip.

At the landing place, fish may be found in several different ways, as a bulk of mixed species, or separated by species (in boxes), or even by size categories. In all cases, when the total landing of a given species, or a fraction of a given species (e.g. juveniles or small size fish), is too abundant, it seems reasonable to make a sufficiently representative subsample. Statistical techniques, beyond the scope of this manual, must be applied to obtain the optimum sample size (Gulland, 1966; Cochran, 1977; Baird, 1983; Pauly, 1983; Galluci *et al*., 1996).

For instance, to get data on the length composition of individuals in the landing, a subsample (e.g. a box) should be selected randomly from each fishing day per target species, also recording the total weight of the catch of that particular species. All the size categories of a given species should be represented in the sample (note: it is important not to collect biological parameters for only small or large individuals). These measurements can either be taken directly at the landing place (when feasible), or the sample can be purchased in order to collect additional biological parameters, such as age, individual weight, sex and maturity stages, and assess them later in the laboratory.

- Sampling mixed species - When faced with a mix of species for sampling, the first basic task is to estimate the proportions of each one in the bulk load. In this case, it will probably be necessary to take larger subsamples of fish from each location in the bulk. Each subsample should be of approximately similar size. There is no guarantee that a large load of fish will be homogeneously mixed. Ideally, sampling would give each fish in the load an equal chance of inclusion in the sample, but this is seldom achievable in practice, given restricted physical access, time and other difficulties. Therefore, to maximize the accuracy of the mean of the sample, the sample should be made up of subsamples of the species taken, for example, from several boxes. If this is impractical, collection of data should try to devise other practical ways to minimize the influence over the choice of individual species, so that all possible classes are present in the sample in roughly the same proportions as they are in the bulk. To improve accuracy further, the number of species collected in a sample should be large, but only if the species are selected independently.

- Sampling single species - For species divided into size categories, following market demand, a sample should be collected from each size category. To maximize accuracy in this case, the sample should be a composite from subsamples of individuals taken from several size

categories. It is essential to record the total weight of landing for that species and, if present, for each size category.

(b) Sampling on board commercial vessel

At sea, ideally fishery observations should make a more precise record of the weight and/or number of individuals by species and per fishing hauls. Sampling on a boat poses many difficulties, apart from those associated with working on an unstable platform. On board commercial vessels, the data collectors must work in a way that will cause the least possible interference with the normal work of the crew and often, they will have a very limited time in which to obtain their samples. If it is not feasible to sample the entire fishing trip, some hauls should be taken randomly. There is no predefined list of hauls upon which one can base a random sample. The idea could be to make a kind of systematic sampling, spreading the samples equally during fishing day(s). On board, catches are often split into categories and subcategories depending on commercial values. For each main commercial species, the total weight should be collected.

(c) Self-sampling

Self-sampling occurs when fishers themselves collect, and sometimes process, biological samples and report on these. It is a tool that has been developed recently to obtain data in an affordable manner, often producing a higher rate of coverage (in time and space). At-sea sampling of commercial fishery catches by observers could result in a relatively expensive exercise, in terms of cost and human resources. From this perspective, sampling by fishers (self-sampling) may offer an alternative, since a larger number of trips can be sampled at a lower cost. However, a major problem with the self-sampling approach is that some scientists and/or managers consider that the data provided by fishers may not have been collected in a sufficiently rigorous manner, and they may be biased as a result (Hoare *et al*., 2011). To avoid these problems, regular and accountable training sessions for fishers can be conducted to guarantee the accuracy and reliability of data collection. Communication, feedback, incentives and shared motivation are essential for good cooperation.

In the event of self-sampling activities, countries should ensure that:

- fishers are trained;
- protocols are well developed;
- results are scrutinized for flaws, and controlled for bias.

(d) Sampling on research vessel for experimental or/and scientific survey

Besides commercial fisheries' statistics, another source of information for biological data is fishery-independent data collected by scientific experimental survey at sea, carried out on commercial or scientific vessels. Surveys provide accurate indices of species/stock abundance and distribution, though the major problem is cost. Surveys require fishing with a standard vessel using standard fishing gear at predetermined fishing stations, selected according to a fixed-grid, fixed-site or stratified random sampling design. Such surveys provide an estimate of average fish density (e.g. per area swept by a trawl net; as fish encounters with longlines or gillnets; number of nautical miles for acoustic survey etc.) over the entire spatial range where the species might be found. It also provides mapping of the spatial distribution of density over the entire range.

In the Mediterranean and Black Sea, a number of countries already undertake regular fishery-independent surveys. Survey data for most species are regularly analysed. Hence, opportunities already exist for some countries to provide biological information for a number of species by analysing available data from these existing surveys. Scientific survey methods and procedures carried out in the Mediterranean and Black Sea are developed and available in different manuals (e.g. MedSudMed, 2006; SoleMon, 2011; Medias Handbook, 2012; Medits Handbook, 2013, 2016).

Information to be collected during each sampling day
at landing/market places or on board commercial vessels

- *fleet segment sampled;*
- *area (GSA) and time period;*
- *gear used;*
- *name of selected target species (Appendix A);*
- *length of all individuals contained in at least one sample (e.g. a single box) of the total commercial landing of that species;*
- *sample weight;*
- *total landed quantity (by weight) of the species selected for sampling;*
- *discarded fraction of the target species;*
- *total weight of all landed species.*
- *Incidental catch of vulnerable species*

6.2 Merging and selection of fleet segments

6.2.1 Merging procedures

In order to optimise the sampling, and according to the inputs received by the Subcommittee on Stock Assessment and the Subcommittee on Economic and Social Sciences (GFCM, 2015a, 2015b), fleet segments could be merged (i.e. aggregating length classes) if they:

- have similar exploitation patterns (targeting the same species);
- exploit the same portion of the population (i.e. juveniles or adults).

When a country proposes to aggregate fleet segments, the rationale and corresponding references (e.g. existing scientific studies) should be brought to the attention of the relevant subsidiary bodies, which in turn should confirm the similarity/homogeneity of the combined cells. In the case of merged segments, the code to identify the newly defined fleet segment will be provided by the GFCM Secretariat.

At the beginning of each sampling year, each country should transmit a list of all fleet segments (based on Appendix B and/or fleet segments resulting from merging process, if any) operating in each GSA (see as an example template 1 below), using a standard template (Appendix N).

Template 1) Fleet segments operating in the GSA

GFCM subregion	*XX*
GSA	*XX*
Country	*XX*
Reference year	*XX*
1) List of all fleet segments operating in the GSA	**Notes**
Small-scale vessels with engine using passive gear < 6 m	
Small-scale vessels with engine using passive gear 6-12 m	
Beam trawlers 6-24 m	length classes have been merged because the exploitation pattern is the same
Pelagic trawlers 12-24 m	
Trawlers 6-24 m	vessels, independently from the length classes, exploit the same portion of the population
Longliners < 6 m	
Longliners 6-24 m	length classes have been merged because the exploitation pattern is the same
Polyvalent vessels 6-12 m	
Polyvalent vessels 12-24 m	
…….	…….

6.2.2 Selection procedures

The collection of biological parameters for all fleet segments, identified by the country in each GSA (template 1), may be difficult to achieve for obvious and practical reasons (i.e. technical cost, human resources), and a selection of fleet segments to be sampled can help. Due to the fact that the main aim of a sampling plan is to estimate parameters that are representative of the population of interest, it is important to find the best compromise between quality and cost.

Following this rationale, only for biological data, a weighting procedure based on landing (tonnes), effort (fishing days) and economic values (total landing value) can be applied to identify the fleet segment to be sampled. To carry out this exercise, the mean values for the two years preceding the reference year (i.e. the year to which the collected data refer) should be used (e.g. for reference year 2013 this means values of 2011 and 2012 - Table 3).

The weighting procedure implies these three steps:

1) **Step one**
   Distribute yearly data on landings (tonnes), effort (fishing days) and value (economic value in national currency) as shown in Tables 3a, 3b and 3c in the examples below. These data, by year, should cover all country fleet segments operating in each GSA. It is important that *all* fleet segments, for which fishing activity has been recorded during the two years preceding the reference year are included in the initial weighting exercise.

Table 3a - Effort values (in fishing days) reported for each cell of the identified fleet segments (based on Appendix B and/or on fleet segments resulting from a merging process, if any). Data should be reported by GSA and by year (for each of the two years preceding the reference year).

		Fleet segments				
		Vessel groups	*Length classes (LOA)*			
			< 6 m	6 - 12 m	12-24 m	> 24 m
Polyvalent	P	Small-scale vessels without engine using passive geas	0	0	115	2
		Small-scale vessels with engine using passive gear	0	30	160	0
		Polyvalent vessels	1	4	20	2
Seiners	S	Purse seiners	0	3	0	0
		Tuna seiners	0	1	3	0
……..		……..	…..	…..	…..	…..

In each cell the total *number of fishing days* by fleet segment and per GSA is reported

Table 3b - Landing values (in tonnes) reported for each cell of the identified fleet segments (based on Appendix B and/or fleet segments resulting from a merging process, if any). Data should be reported by GSA and by year (for each of the two years preceding the reference year).

		Fleet segments				
		Vessel groups	*Length classes (LOA)*			
			< 6 m	6 - 12 m	12-24 m	> 24 m
Polyvalent	P	Small-scale vessels without engine using passive gear	0	0	250	12
		Small-scale vessels with engine using passive gear	0	65	325	09
		Polyvalent vessels	6	24	185	0
Seiners	S	Purse seiners	0	80	0	0
		Tuna seiners	0	150	2800	0
……..		……..	…..	…..	…..	…..

In each cell the total *landing* by fleet segment and per GSA is reported

Table 3c - Economic values of landing (in local currency), reported for each cell of the identified fleet segments (based on Appendix B and/or fleet segments resulting from a merging process, if any). Data should be reported by GSA and by year (for each of the two years preceding the reference year).

		Fleet segments				
		Vessel groups	*Length classes (LOA)*			
			< 6 m	6 - 12 m	12-24 m	> 24 m
Polyvalent	P	Small-scale vessels without engine using passive gear	0	0	27500	2300
		Small-scale vessels with engine using passive gear	0	3330	45000	0
		Polyvalent vessels	650	4400	9600	2850
Seiners	S	Purse seiners	0	5000	0	0
		Tuna seiners	0	1250	2300	0
……..		……..	…..	…..	…..	…..

In each cell the *total value of the landing* (in local currency) by fleet segment and per GSA is reported

2) Step two

Once all the cells of the fleet segments potentially active in each GSA have been filled in, the following steps should be taken:

- List all identified fleet segments (by GSA) following the procedure reported in Table 4.
- Calculate the *mean values* of the selected variable (e.g. effort) based on the two years preceding the reference year.
- Rank the fleet segment cells according to their share of the total effort, in different columns. The shares *(percentage contribution*) should then be added up starting with the largest figure. All fleet segments belonging to the top 90 percent share (*cumulative %*) will be selected for sampling.
- Repeat the same cumulative process for the other two variables (landings and economic value). The fleet segments in the top 90 percent, whether or not they coincide with the previous top 90 percent (e.g. by effort), will be added to the selection.

Table 4 - Example of a weighting exercise for the selection of fleet segments according to the number of fishing days (i.e. effort values):

- in the first column all the fleet segments identified in each GSA are reported;
- in the second column the total number of fishing days carried out in 2011 are reported;
- in the third column the total number of fishing days carried out in 2012 are reported;
- in the fourth column the mean value of fishing days for each fleet segment is reported for the two years preceding the reference year;
- the last two columns report the percentage (%) contribution of each fleet segment and the cumulative values (%) reached. Highlighted in grey are the fleet segments that have been selected, representing 90 percent in terms of fishing effort. These segments represent the basis for the collection of biological data.
- The same exercise should be repeated for each GSA and for landings and economic values contributions.

Fleet segments (GSA)	***total n fishing days 2011***	***total n fishing days 2012***	***Mean values***	***Percentage contribution %***	***Cumulative %***
Small-scale vessels with engine using passive gear 6-12	76 281.29	57 675.66	66 978.48	37.96	37.96
Longliners 12 - 24 m	37 215.3	49 594.56	43 404.93	24.60	62.56
Trawlers 12 - 24 m	38 726.13	31 651.7	35 188.92	19.94	82.50
Trawlers > 24 m	6 558.75	10 080.54	8 319.645	4.71	87.21
Pelagic trawlers 6 - 12 m	7 991.17	2 471.04	5 231.105	2.96	90.17
Trawlers 6 - 12 m	6 014.55	3 754.39	4 884.47	2.77	92.94
Small-scale vessels with engine using passive gear 12 - 24 m	4 689.74	3 310.71	4 000.225	2.27	95.21
Purse seiners 12 - 24 m	4 463.06	1 794.07	3 128.565	1.77	96.98
Longliners 6 - 12 m	2 693.12	1 795.27	2 244.195	1.27	98.25
Beam trawlers 6-12 m	1 518	1 403	1 460.5	0.83	99.08
Tuna seiners > 24 m	1 510.8	272.47	891.635	0.51	99.59
Small-scale vessels with engine using passive gear < 6 m	101.34	1 024.3	562.82	0.32	99.92
Beam trawlers < 6 m	336	0	168	0.10	100.00
Purse seiners 6 - 12 m	0	0	0	0.00	100.00
Beam trawlers > 24 m	0	0	0	0.00	100.00
(report all other fleet segments)	0	0	0	0.00	100.00
			176 463.5	100%	100%

3) Step three

In each GSA the sampling strata, for the estimation of the biological parameters (e.g. length, sex and maturity), will be constituted by all fleet segments above the 90 percent mark, even if they have been identified according to one of the cited criteria only (landings, values and effort).

In addition, a country may also add to the selection any fleet segment not picked up by the exercise but that may be of special importance for any other criteria (i.e.: conservation, ecological or social relevance).

At the beginning of each sampling year, and based on the results of the weighting procedure, each country should transmit a list of those fleet segments operating in each GSA that have been identified for the collection of biological variables, as well as those for which discard information will be collected[24]. To provide these lists by GSA, countries should use a standard template (Appendix N - see example provided in template 2 below).

Template 2) Fleet segments selected for the collection of biological variables

GFCM subregion	*XX*	
GSA	*XX*	
Country	*XX*	
Reference year	*XX*	
2) List of fleet segments selected, through the weighting procedure, for the collection of biological variables	**Discards (Y/N)**	**Notes**
Trawlers 6-24 m	Yes	
Small-scale vessels with engine using passive gear 6-12 m	No	discard represent less than 10% of total catch
Polyvalent vessels 12-24 m	No	no discard
Longliners 6-24 m	No	discard represent less than 10% of total catch
……..	….	……

Once the fleet segments (strata) have been identified through the procedure described above, a certain number of fishing trips to be sampled (e.g. on board, at market, at landing place etc.) should be assigned to the selection. The number of fishing trips to be sampled should ensure good coverage for each of the fleet segments selected. Due to variations in the consistency and composition of fishery fleets, as well as in the corresponding extension and availability of fishing grounds, not only in the region, but also between subregions and countries, trips should be assigned within a country and in each GSA taking into account parameters such as gear, fishing ground and temporal stratification (e.g. month, season).

For the design of a proper stratified sampling exercise, the numbers of trips assigned to each fleet segment must be proportional to the effort and adjusted to the variability in the catches of that fleet segment. Statistical methods must be applied to calculate the right number of samples that takes into account this variability.

Where trips occur across two or more GSAs, sharing the same resources, the landing, effort and value data should be distributed proportionally among the different GSAs. When planning a sampling programme, the number of trips to sample per fleet segment becomes an expectation based on the fishing activities of the previous years, not a target, and may vary if the fleet's activities change over time.

[24] Discards information should be collected only when the discard rate exceeds 10 percent of the total volume of catches for a given fleet segment in a given GSA.

6.3 Selection of species

Usually, due to restricted funds and personnel, it is not possible to collect data (e.g. biological data, effort data etc.) from all species of commercial interest. A limited number of species (namely priority species) should be selected as representative of the entire living resources. The concept of priority species represents a key factor for the management of fisheries resources (Barone *et al*., 2006; AdriaMed, 2007; Ungaro *et al*., 2008). In the context of data collection, priority species are those for which the most complete set of data are required. Their identification has to be based on criteria relevant to the objectives of the GFCM: development, conservation and management. In this regard, not only abundance, but also price and/or market demand and ecological importance should be taken into account as selection criteria. The use of different parameters to identify the priority species is helpful in assigning the correct importance to some species, which may not be very abundant, but which, for example, fetch a high market price.

According to these criteria, three different groups have been established, whereby species are listed at subregional level (GFCM subregions - Appendix L): the first group concerns the **frequency of assessments** (i.e. species that are regularly assessed); the second one concerns the **fishery's importance** (i.e. landing, catch and/or economic value); the third group is based on **conservation criteria** (i.e. endangered species) or impact of their presence on the ecosystem (i.e. non-indigenous species).

Criteria used to identify the main groups of species

Group 1: *Species for which assessment is regularly carried out.*

Group 2: *Species that are important in terms of landing and/or economic values at regional and subregional level, and for which assessment is not regularly carried out.*

Group 3: *Species within international/ national management plans and recovery and/or conservation action plans as well as non-indigenous species with the greatest potential impact.*

The lists of species identified for each group and GFCM subregion are presented in Appendix A. These lists should be considered as a dynamic tool; any change (i.e. deletion or insertion of species) should be brought to the attention of the relevant subsidiary bodies for approval. Future changes could therefore occur on the basis of the information gathered.

Countries are requested to collect biological information for all the species identified in all GFCM subregions (Appendix L) where their fisheries take place. For all the selected species in Group 1, Group 2 and Group 3, length data per fleet segment should be collected (Subtask VII.2 Length data - Chapter 2). Individual information on sex and length at maturity is mandatory for species belonging to G1 (Appendix A.1). Countries are also kindly invited to provide this information for species belonging to G2 and G3, if available (Appendixes A.2 and A.3).

Exceptions can be applied for the collection of biological data related to certain species, according to the following criteria:

1st the species is/are not present in the country;
2nd the species is present in the country, but its weight accounts for less than 2% of total landings of the country.

Both exemption rules are applicable to all countries within each group of identified species. However, the transmission of length data (Table VII.2 - Chapter 2) is strongly encouraged, at least for elasmobranches species (G3), even if the volume of catches does not reach the 2% of the total national

landing. This aims to improve knowledge, especially for some rare elasmobranches species that have a sporadic and unconfirmed presence in the Mediterranean.

At the beginning of each sampling year, each country should transmit a list of the species (Appendix N), based on the identified regional species groups (Appendix A), for which data collection (i.e. length, sex and maturity) will be carried out.

This exercise, at country level, should be repeated for all of the three groups of species. Moreover if a species, which is not present in one of the three groups of species, is important at the national level for any reason, it can be added in the country's sampling scheme, specifying the reason. To provide this list, countries should use a standard template (Appendix N - see example provided in template 3 below).

Template 3) Species for which data collection will be carried out

GFCM subregion	*XX*	
GSA	*XX*	
Country	*XX*	
Reference year	*XX*	
Group 1 species	**Data to be collected (Y/N)**	**Notes**
Merluccius merluccius	Yes	
Mullus barbatus	Yes	
Mullus surmuletus	Yes	
Parapenaeus longirostris	No	Species accounts for 1.2% of total national landings (below the 2% threshold)
Sardina pilchardus	No	Species is not present in the country
Nephrops norvegicus	Yes	
……	…..	
Group 2 species	**Data to be collected (Y/N)**	**Notes**
Eledone cirrhosa	Yes	
Diplodus annularis	No	Species accounts for 1.2% of total national landings (below the 2% threshold)
……	…..	

6.3.1 Length

Length frequency distribution provides information on the demographic structure of the sampled population. Length measures are easy to make, but require many observations in a well-defined and standardized way, in order to allow for comparison of results. The length measurements to be taken depend on the group of species under study. The length of fish and cephalopods is generally measured with graduated fish measuring instruments, called "ichthyometers", while calipers are used for crustaceans.

Bony fish and *Elasmobranchs* - For bony fish, sharks, skates and rays, the length should be considered as the total length (TL). The fish is measured to the lower half centimetre, from the tip of the snout to the end of the caudal fin (Figures 3a and 3b). In elasmobranchs, fork length (FL) could be recorded when the caudal fin is damaged and the total length cannot be taken. Country could also report length

data using the standard length (SL). SL is defined as the measurement taken from the tip of the lower jaw to the posterior end of the hypural bone.

The length classes should be reported in centimetres (as a whole number, or half cm, e.g. 0.5, 1.0, 1.5 etc.).

a)

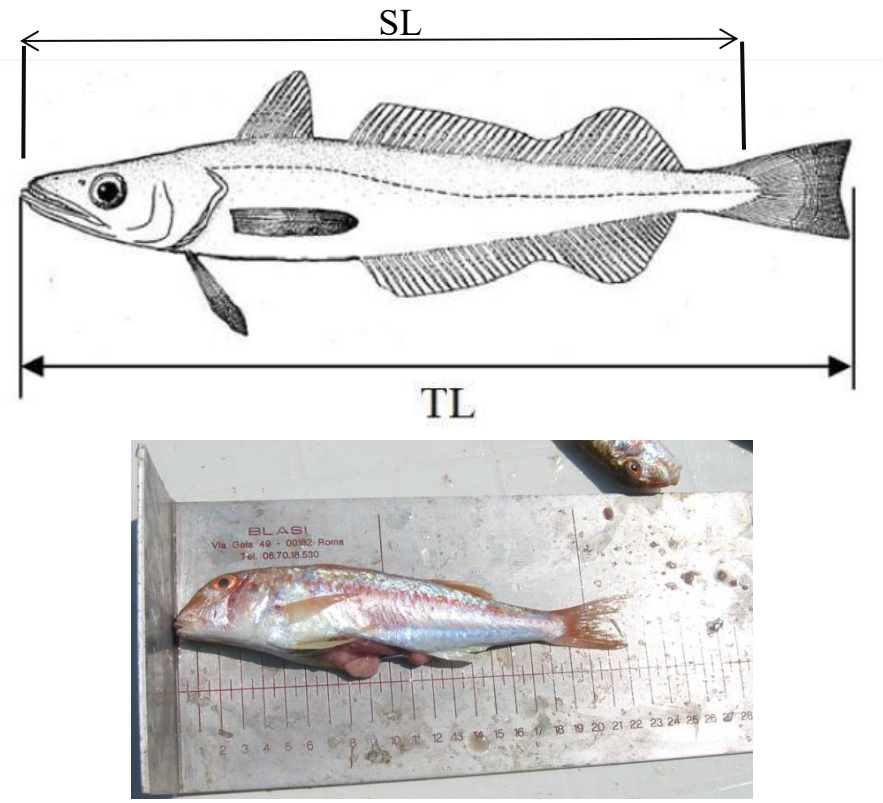


Figure 3a. Illustration showing the measurement of total length (TL) and standard length (SL) in bony fish. TL = Total Length (photo by Carpentieri P.).

b)

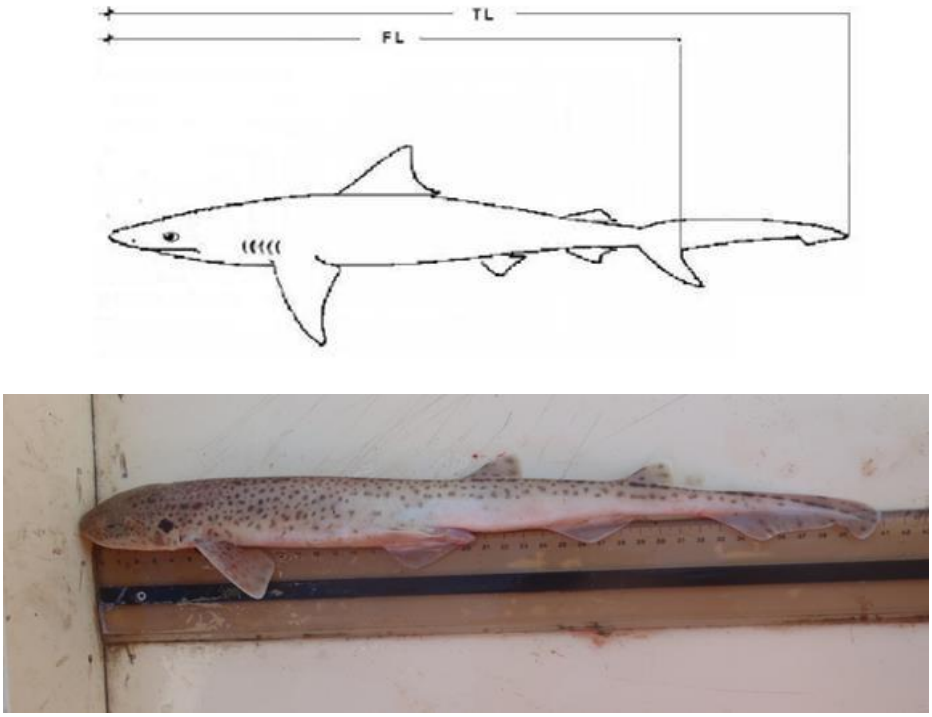


Figure 3b. Illustration showing the measurement of total length in elasmobranchs. TL = Total Length; FL = Fork Length (photo by Carpentieri P.).

Crustaceans - For crustaceans (lobsters, crawfish, shrimps, prawns, stomatopods), the standard measurement is the minimum length of the carapace length (CL). The length classes should be reported in millimetres (as a whole number, e.g. 1, 2, 3, 4 etc.). The crustacean is measured, to the lower millimetre (mm), from the back border of the eye orbit (inside of the eye socket) to the posterior margin of the carapace (Figure 4). All measurements are taken with calipers.

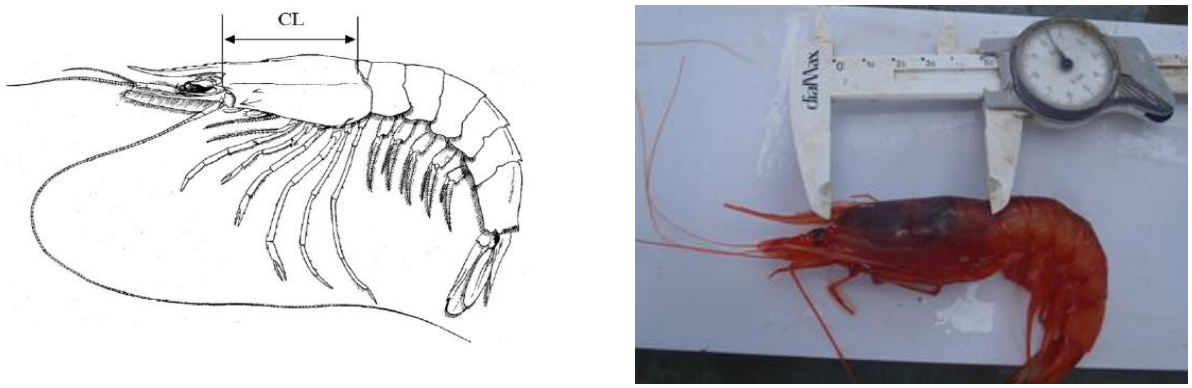


Figure 4. Illustrations showing the measurement of carapace length (CL) for crustacean's decapoda (photo by Carpentieri P.).

Cephalopods - For cephalopods, the length is the dorsal mantle length (ML). The length classes should be reported in centimetres (cm). The cephalopod is measured to the nearest lower half centimetre. The size should be reported in centimetres (as a whole number, or half cm, e.g. 0.5, 1.0, 1.5 etc.). For the Octopoda, measurement is taken along the median line, passing through the eyes, to the apex of the mantle, as shown in Figure 5a. For Decapoda, measurement is made along the dorsal midline from the mantle margin to the posterior tip of the body, excluding long tails (Figure 5b).

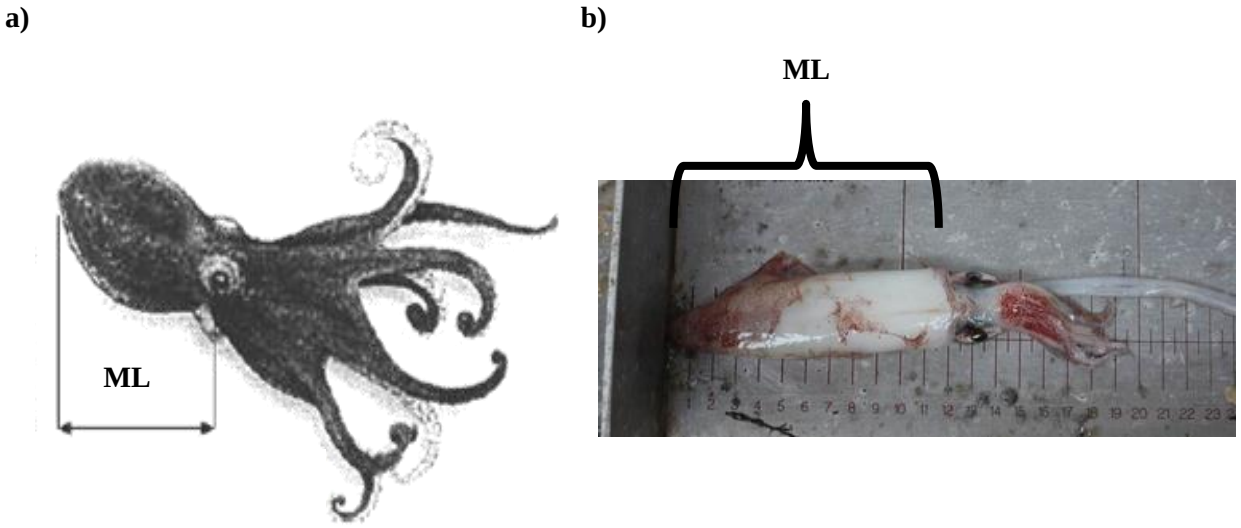


Figure 5. Illustrations showing the measurement of dorsal mantle length (ML) on cephalopods a) Octopoda and b) Decapoda (source: Dimech *et al.*, 2012; MEDITS Handbook, 2013, 2016; photo by Carpentieri P.).

6.3.2 Weight

Individual weight is important biological information, although the weighing of individuals may prove to be more complex depending on prevailing conditions in the workplace. It is essential to establish length-weight relationships for all target species, because at some stage in stock assessments, lengths of fish have to be converted to weights of fish.

The choice of weighing device (e.g. hanging balance, electronic balance) depends on the size of the sampling and working conditions. For fish, elasmobranch and cephalopod species, the total weight of each individual could be reported to the nearest 1 g, using an electronic balance. In the case of crustaceans, the weight should be recorded to the nearest 0.1 g.

The length-weight relationship for single species requires a large set of data in order to obtain good representation of the entire "size ranges" of a species: from the smaller individuals to the larger ones. This will help to increase the accuracy of estimates. It is also important to stress that the length-weight relationship may vary seasonally, and between each sex.

6.3.3 Sex and maturity

Knowledge of the length of the species at maturity and of the spawning periods could improve best practices in the sustainable management of fisheries, particularly with respect to regulations on gear selectivity and fishing seasons.

Macroscopic observations can distinguish sex categories: Male (M), Female (F), Undetermined (U - when, after dissection, it was not possible to determine the species' sex with the naked eye) and Not Determined (ND - individual that has not been examined). It is also important to be aware that some

species are hermaphrodites. This means that fish can change sex during their lifespan, either from male to female (protandrous), or from female to male (protogynous). The change may occur more than once in a lifetime. Some hermaphrodite species have both sexes at the same time. In this latter case, the sex is determined on the basis of the most developed gonad and should be reported accordingly. Those definitions could be applied to all groups of fish, crustaceans, elasmobranchs and cephalopods.

Concerning maturity, the macroscopic determination of the maturation stage of a marine organism is a powerful tool for routinely monitoring "maturation schedules", whatever the scale chosen. It is important to remember that the maturation stage assigned to a given individual is relative to its adulthood condition. An "adult" fish caught and analysed macroscopically in a period that is different from its reproductive season can, in fact, have a resting (or spent) gonad that is similar in appearance to that of a juvenile fish. Ovary and testes change their aspect and their relative weight during maturation, according to the species' physiology, growth and/or external factors (environment and season).

A large number of macroscopic maturation scales is available in literature, varying from over-simplified scales comprising three to four stages, to highly specific and relatively complicated scales (up to nine stages). The need to adopt a common acceptable maturity scale, as well as to establish objective criteria for the definition of each maturity stage, is considered a crucial issue in order to give a common tool for exchanging data and scientific information. The macroscopic maturity stages presented in this manual (Appendix G) are mostly based on the general aspect, shape, dimension, position and colour of the gonads. These scales derive from knowledge and experience gained during different surveys and ongoing working groups, carried out in the Mediterranean and Black Sea area (Ungaro, 2008; ICES, 2010a, 2010b; SoleMon, 2011; Dimech *et al.*, 2012; Medias Handbook, 2012; Medits Handbook, 2013, 2016; Follesa *et al.*, 2015).

It is important that, whatever the maturity scales used by each country in their sampling process, the information gathered (Subtask VII.3 Other biological data - Chapter 2) should be transmitted with reference to the maturity scales herein proposed (Appendix G).

Bony fish - The determination of sex for fish is only possible by dissecting individuals. Very few species have clear external sexual dimorphism, and it is therefore necessary to dissect the fish, since the internal body cavity must be exposed, and the shape and appearance of the gonads examined. In adult females, the eggs are readily seen in the ovaries; in adult males, the testes are typically smooth, whitish and non-granular (Figures 6 and 7).

For fish, a 4 stage scale (Appendix G.1) could be used to report the maturity stage (Medits Handbook, 2013, 2016). The stages (from 0 to 4) are based mainly on the relative volume, the consistency and the colour of the gonads, the presence of sperm in males and the presence and the degree of hydration of the eggs in females.

Figure 6. Sexual macroscopic determination of male (left) and female (right) of *Merluccius merluccius* (photos by Carpentieri P.)

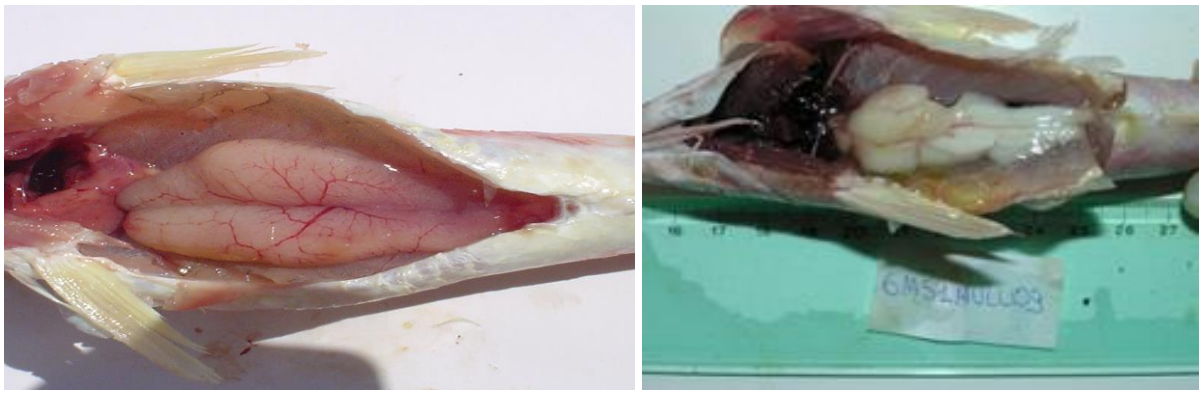


Figure 7. Sexual macroscopic determination of female (left) and male (right) of *Mullus surmuletus* (photos by University of Cagliari/Follesa C.).

Crustaceans - Sex for crustacean's decapods can be determined by the naked eye: the petasma (visible on the 2nd pleopods) and thelycum (present on 4th sternite) will indicate males and females, respectively (Figures 8a and 8b).

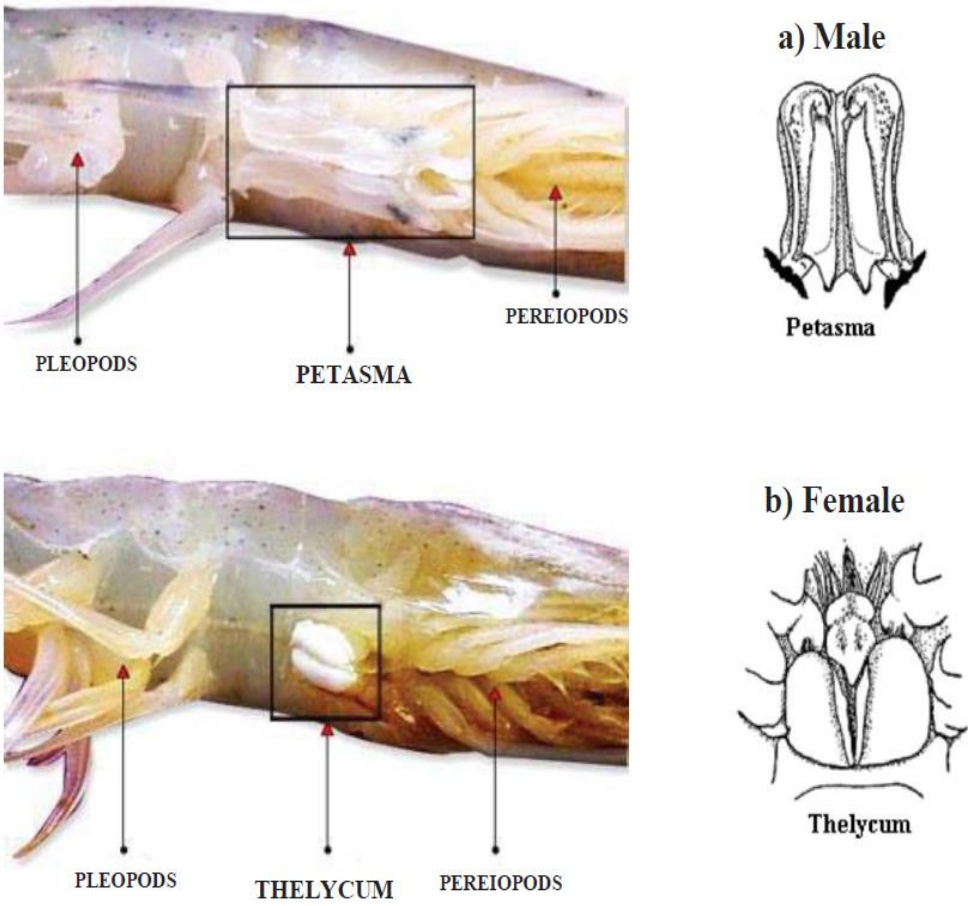


Figure 8. Illustrations showing the sexual macroscopic determination of sex in crustacean's decapods (source: Dimech *et al*., 2012).

For decapods, a five-stage scale (ICES, 2010a) has been chosen to report the maturity stage of the most common species (Appendix G.3). The maturity stage can be determined by examining the colouring and appearance of ovary lobes (females) and the fusion degree of the petasma, presence/absence of the spermatic masses on seminal ampullae and the dimension of the rostrum (males). However, in most cases, it is extremely difficult to determine the maturity stage of crustaceans macroscopically, and considerable experience is required.

The maturity scale proposed by Froglia (1996) was chosen to report maturity stages for stomatopods (i.e. *Squilla mantis*, Appendix G.5 and Figure 9).

Taking into account the difficulties in detailing the maturity condition of gonads in males at macroscopic level, no maturity scales for males were presented in this manual.

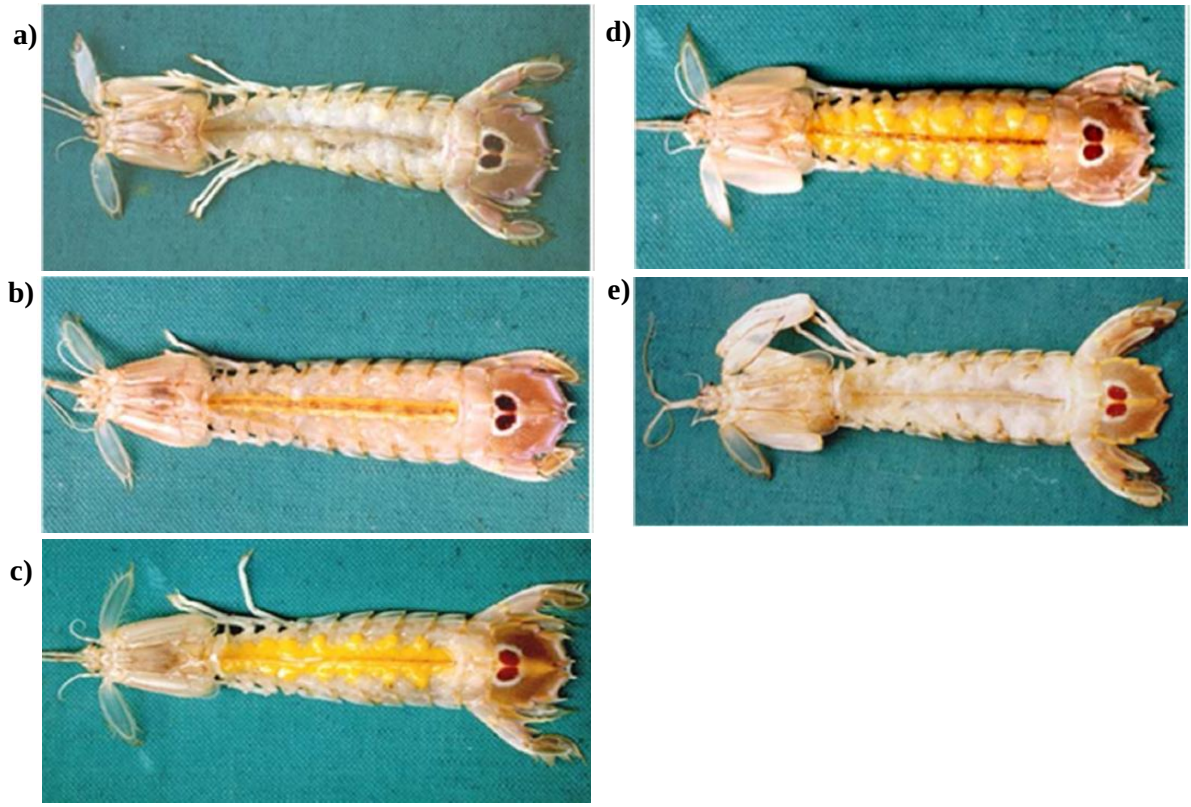
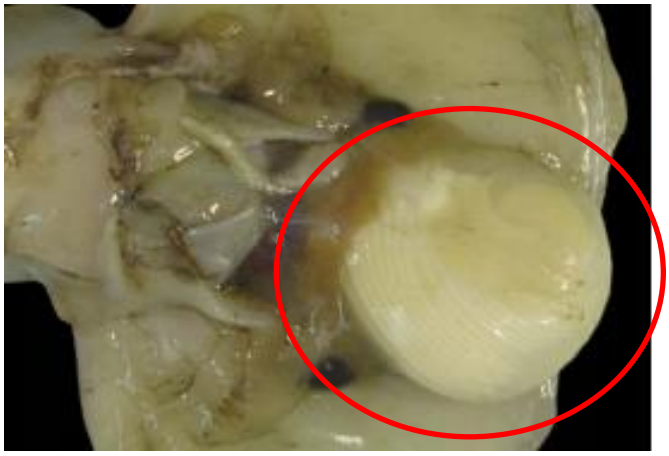


Figure 9. Illustrations showing the sexual macroscopic determination of sex in *Squilla mantis* females, ovaries (dorsal cuticle removed): a) immature b) early maturation c) advanced maturation d) ripe e) spent (source: SoleMon, 2011).

Cephalopods - In the case of cephalopods, sex can be determined by dissecting individuals and checking the presence of a) male and b) female gonads in the mantle cavity (Figures 10a and 10b).

a)



b)

Figure 10. Illustrations showing the sexual macroscopic determination of sex in cephalopods a) *Eledone cirrhosa* spawning male b) *Illex coindetti* spawning female (photos by University of Cagliari/Cuccu D.).

A three-stage scale of maturity (Medits Handbook, 2013, 2016) could be used to report the maturity in cephalopods (Appendix G.2). This scale is based on the development (or size, colouring and appearance) of ovary and nidamental glands in females and the development of testis and spermatophoric complex, including the Needham's sac in males.

Elasmobranchs - For sharks, rays and skates, sex can be determined by the naked eye: pterygopods are organs found on male elasmobranchs (Figure 11). Each male has two pterygopods (or claspers), located along the inner side of the shark or ray's pelvic fin and are used in reproduction. All elasmobranchs have internal fertilization.

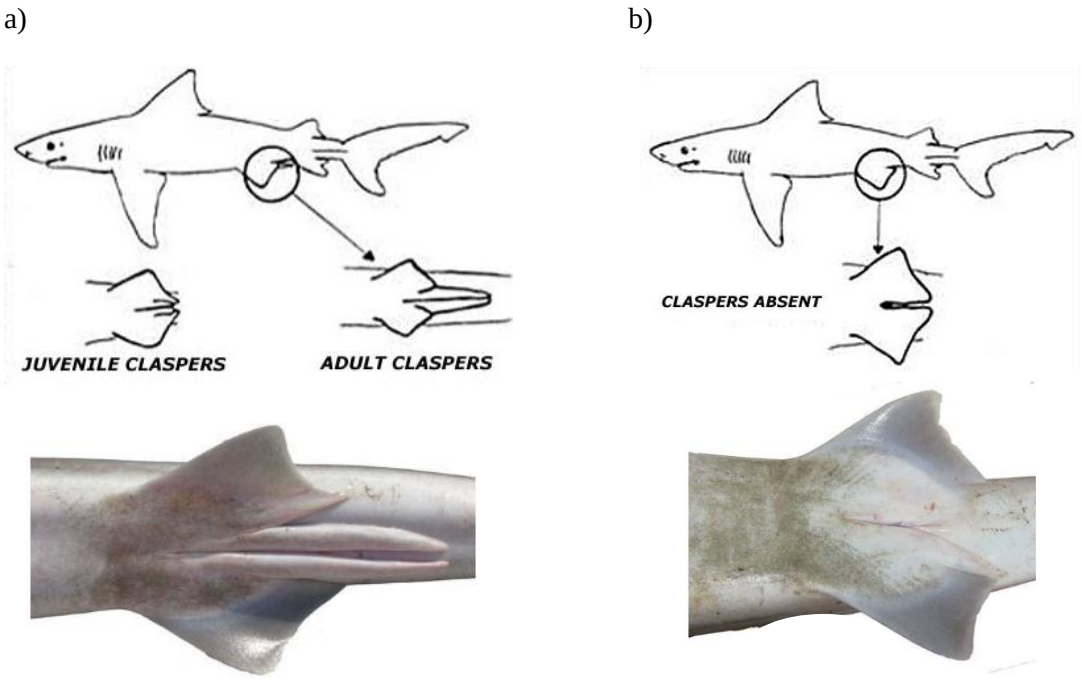


Figure 11. Illustrations showing the sexual macroscopic determination of sex in elasmobranchs a) Male b) Female (source: NOAA - Northeast Fisheries Science Centre).

Based on the degree of development of the pterygopods, it is possible to determine the maturity stages of males. Maturity of females must be determined by internal examination, identifying the development of gonads, ducts and shell glands and/or the presence of embryos and the egg dimensions. Generally, the reproductive system of females consists of ovaries (usually two, but in some species only one is present), shell glands and oviducts. In immature fish, the ovary is barely discernible and contains no eggs, whereas in maturing fish, white eggs are visible in the ovary. In mature fish, the ovaries contain yellow eggs, except immediately after ovulation, in viviparous species, and at the end of the spawning season in oviparous species. In viviparous species, maturity is also associated with changes in the size of the cloaca.

Until 2012, there was no international agreement on the maturity scales to be applied to elasmobranchs. In December 2012, a Workshop on Sexual Maturity Staging of Elasmobranchs - WKMSEL (ICES, 2013) was held, with the main objective of reaching agreement on a common maturity scale for elasmobranchs (sharks, skates and rays), oviparous and viviparous species, across laboratories and countries. The WKMSEL reviewed the maturity scales (Stehmann, 2002; Ungaro, 2008) in use, including in the Mediterranean areas, and proposed two new maturity scales, one for oviparous and other for viviparous species. These scales, based on the development (or size, colouring and appearance) of ovary and nidamental glands in females, and the development of testis and spermatophoric complex, including the Needham's sac in males, could be used to report maturity in elasmobranchs (Appendix G.4).

6.3.4 Age

Having comprehensive and accurate growth information is a key factor in the successful management of fishery resources: knowledge of the age of fish greatly improves population analyses of temporal variation in structure and abundance.

The aged sample also shows the age classes that the population is composed of, or, if the sample is from a particular fishery, the group of age classes exploited by that fishery. Fisheries exert strong selection for certain sizes and therefore ages: most fishing gear are designed to be size/age selective. Fisheries affect population mean size through size selective mortality. For this reason, in addition to the total increase in mortality rate caused by fishing, it is imperative to determine how increased mortality is distributed between age groups in the population.

The strength of each year class is used to forecast stock sizes in the future and show how successful spawning was in each year. The more estimates that can be obtained for the strength of a particular year class (e.g. from consistent sampling in consecutive years), the greater the confidence in the estimate for that year class. These estimates of year class strength can explain variations in total stock abundance and be used to predict future recruitment to the fishery. Moreover, differences in growth rates or population age structures between areas could indicate that multiple stocks occur.

Bony fish - There are several parts of a fish body that can be used for ageing. Currently, the preferred method of ageing fish is examination of otoliths, found within the fish's inner ear. Each year, calcium is deposited in these bony structures in a systematic manner, allowing for the counting of annuli. Scales, vertebrae and various bones can also be used, but otoliths are widely accepted as the best structure for many marine species.

Otoliths, commonly known as "earbones", are paired small and hard structures, located in the semi-circular canals directly behind the brain of bony fish. They are formed by the daily accretion of a layer of calcium carbonate structures, bound within a protein matrix (Figure 12). As the fish grows, a series of concentric opaque and hyaline (translucent) zones are formed. Since the opaque zones are formed in summer and the hyaline zones in winter, the age of the fish may be determined by counting the number of zones. Different species have otoliths of different shapes and sizes. Cartilaginous fish, such as sharks, skates, and rays, have none.

There are various techniques for the removal of otoliths from fish, the choice of which depends on the plane of the cranium section. For teleost, the most commonly used method is from the ventral side, behind the head after removal of the gills.

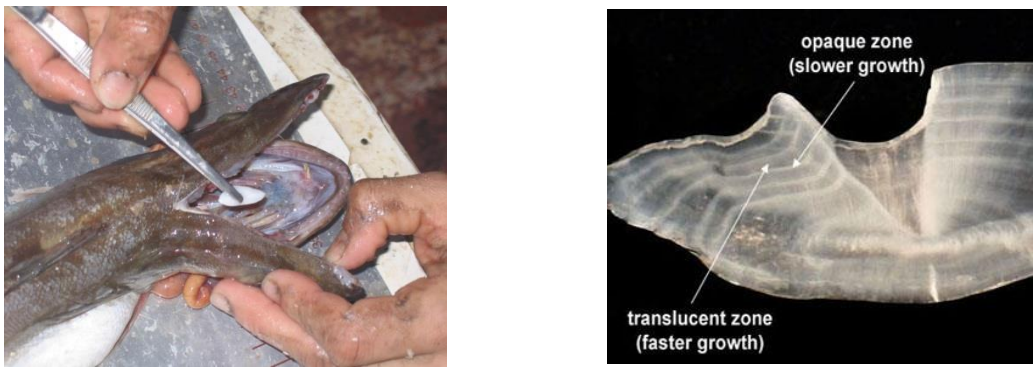


Figure 12. On the left, dissection of fish and extraction of the otolith (photo by Carpentieri P.). On the right, shape of otolith with the alternance of opaque and translucent zones.

The increased standardization in otolith readings between laboratories allows common guidelines, provided by *ad hoc* working groups or experts, to be followed (GFCM, 1982; Campana & Jones, 1992; MedSudMed, 2005; ICES, 2010c, 2010d; Campana, 2014; Carbonara *et al.*, 2015). At the same time, it is important to use different methods, such as the analysis of length frequency distributions, the temporal evolution of the annulus formation on the otolith margin and counts of daily rings, to validate the growth pattern derived from reading (macrostructure interpretation) of hard structures, such as otoliths.

Elasmobranchs - Elasmobranchs have cartilaginous skeletons and therefore lack bony structures with systematic calcium depositing; otoliths are absent and scales do not form discernible growth bands. Some elasmobranch species have hard spines that contain rings suitable for ageing. Most species of elasmobranchs, however, do not have spines, so vertebrae have been used as the ageing structure. Therefore, it is usually the vertebrae (or the fin spine, when present) that should be prepared for age determination. Vertebrae contain concentric pairs of opaque and translucent bands. Several methods have been developed to enhance the concentric pairs of opaque and translucent vertebral bands. Band pairs are counted like rings on a tree, before an age is assigned to the fish based on the count.

Vertebrae (Figure 13) for age determination are usually removed from the cervical or thoracic regions, although the optimal location depends on the species.

a) b)

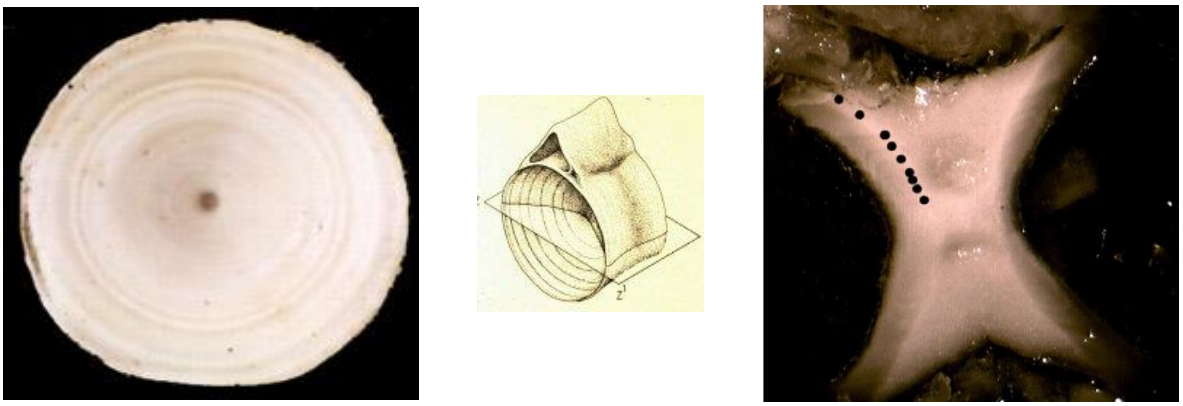


Figure 13. a) Individual vertebrae of an elasmobranch and example of a sagittal cut b) Enhanced vertebral images of *Raja asterias*, annotated to show annual growth bands (source: Campana, 2014).

For many species, the area over the posterior gill slit is often best. A comprehensive summary of more modern ageing methods for elasmobranchs is reported in an *ad hoc* manual (Campana, 2014).
In general, for many species - both elasmobranchs and bony fish - controversies over ageing methodology arise and may last for many years. This is often because several techniques have been used for the same species, and none has been validated to everyone's satisfaction. Indeed, for many species, no reliable or accepted ageing technique has been developed. The aim of age determination studies is to increase precision and accuracy: accuracy refers to the closeness of an age estimate to the true age, whereas precision is a measure of variability between individual readings, either within or between readers. Accuracy can only be assessed through validation experiments, either direct or indirect, while precision can be assessed through intercalibration exercises at different levels (i.e. precision among different readers and/or countries). Indices of precision, among different readers/institutes/countries, may also be a useful tool for conducting comparisons between readers and between methodologies (e.g. otoliths and vertebrae). They can also indicate samples that are "difficult", and that could produce unreliable estimates of age. In order to standardize age reading for target species in the region, the outputs of international workshops on otolith reading should be used as guidelines for interpretation.

Methods for age reading preparation, conservation, validation and programmes are beyond the scope of this manual. However, some general principles of best practice on sample design for catch-at-age are summarized below:

- the number of otoliths/scales/vertebrae should be directly related to the number of age classes in the catch/population;

- age distribution in each reference collection should include all the fish length groups in the catch/landing, and should also ensure that older fish are adequately represented (i.e. from juveniles to very large individuals);

- reference collections should take into account any additional strata, such as sex or spatial units where necessary;

- quantifying precision and bias are important components of ageing studies. Regarding this issue, growth derived from otolith reading needs to be validated using different approaches (e.g. LFDs, seasonal pattern in annual formation, back-calculation, daily rings) before being adopted for any purposes (e.g. stock assessment);

- follow common guidelines, provided by *ad hoc* working groups.

Chapter 7 - Shared stocks

In the Mediterranean, the importance of shared fishery resources is widely recognized, and a list of shared stocks has already been proposed by SAC (GFCM, 2006) (Appendix I).

The term "shared fish stocks" is understood by FAO-GFCM as *"a group of exploitable organisms, distributed over, or migrating across, the maritime boundary between two or more national jurisdictions, or the maritime boundary of a national jurisdiction and the adjacent high seas, whose exploitation is carried out by more than one country and which can only be managed effectively through cooperation between all concerned States."*

In different Mediterranean and Black Sea GSAs, fleets of different countries exploit the same stocks/species, which are either pelagic (e.g. anchovy, sardine) or demersal (e.g. hake, red shrimps *Aristeus antennatus* and *Aristaeomorpha foliacea*), and which could be frequently found in international waters (i.e. outside the 6 or 12 nautical mile border, delimiting national waters). Since the activity of one fleet has a direct effect on the fishing opportunities of others exploiting the same fish stocks, and on the associated ecosystems, management measures applied only by a part of the operating fleets would have a very limited effect on these stocks.

To address this issue, it will be important that all the available information, for the most important commercial stocks in the different areas, be used in the best way possible to gather evidence on the occurrence of shared stocks. This information should be related to:

- fishery activities (catches, target species, landing sites and distribution of fleets and effort);
- existence of physical barriers to the species' lifecycle (e.g. continental shelf interrupted by deep waters);
- differences in biological parameters (e.g. growth, maturity, etc.);
- population genetic, morphological differences (e.g. otolith, meristics, etc.);
- larval dispersal, water circulation and distribution of nurseries and spawning grounds (e.g. fishery independent data source).

The term "shared stocks" can include the following definitions:

(a) Trans-boundary stocks - fish resources crossing the Exclusive Economic Zone (EEZ) boundary or national waters of one coastal State into the EEZ(s), or national waters, of one or more other coastal States.

(b) Highly migratory fish stocks - stocks that can be found both within the coastal State's EEZ/national waters and the adjacent high seas.

(c) Straddling stocks - fish stocks (with the exception of anadromous/catadromous stocks) that are found both within the coastal State's EEZ/national waters and the adjacent high seas.

(d) High seas fish stocks - stocks that can be found exclusively in the high seas.

On the basis of the above criteria, and of the outputs of the work carried out by the FAO regional projects (AdriaMed, 2007) and by GFCM SAC (GFCM, 2008), the list of shared stocks (Appendix I) can be regularly updated and thereafter brought to the attention of the relevant subsidiary bodies for approval.

Chapter 8 - Data quality

The quality of fisheries data is related to the precision and accuracy of measurements made on fisheries variables. It is subject to many factors, including data type, nature of fisheries and economic, social or ecological values of fisheries (Cochran 1977; FAO, 1999; Kolding & Ubal Giordano, 2002; Pennington *et al*., 2002; Vigneau & Mahevas, 2004; ICES, 2008, 2010e). All collected data contain some level of bias and random variation. Improvements needed in precision and accuracy often require greater relative expenditures on sampling and analysis.

Data quality must be ensured in all data collection phases: survey design, field and laboratory methods, data processing and transmission.

Errors deriving from different sources have different statistical characteristics: errors linked to direct measurement of fishery variables (e.g. length, weight), or to well-designed sampling programmes, are likely to be random and small. In some cases, errors associated with fisheries data can be non-random and biased, a characteristic of low-quality data.

Quality indicators such as statistical dispersion parameters are needed to perform quality controls. In the region, the definition of such indicators is in progress and needs to be agreed upon by all CPCs in order to establish control routines.

Generally, a routine quality validation/control should be performed at both internal (e.g. country) and external level (e.g. GFCM Secretariat) to quantify the accuracy and precision level and, if problems are identified, they must be solved before datasets are assembled.

Internal validation

The design and implementation of statistical sampling schemes is placed under the responsibility of the each country.

In order to meet fisheries data requirements in existing GFCM decisions, it may be necessary to improve, standardize and possibly modify current national data collection systems. A more efficient use of sampling resources may require the definition of best practices for sampling design and data analysis, with the aim to obtain accurate variable estimates with minimum bias and uncertainty levels.

It is fundamental that field collection, laboratory techniques and data processing be applied consistently and correctly. The integrity of the data should be also maintained and documented, from sample collection to entry in the data record.

Countries are expected to keep, at the national level, standard data quality documentation as follows:

- *A standard operating procedure* which should include:
  - the quantitative goals of the monitoring programme;
  - the methodological details of all steps performed (e.g. fields and laboratory aspects);
  - details of the procedure related to the analysis and archiving of data.

- *A quality manual* which should describe:
  - the quality assurance system in place;
  - the frequency at which different aspects of quality assurance should be reviewed;
  - the standards that should be met;
  - the actions needed if the standards are not met.

Precision, accuracy, representativeness, completeness, and comparability are all components of the quality that should be taken into account.

Precision	Measure of the proportion of agreement among replicate measurements.
Accuracy	The degree to which a recorded measurement varies from a true or expected value.
Representativeness	The extent to which measurements represents the true value in the population.
Completeness	The proportion of valid data collected with regards the total expected.
Comparability	The extent to which data from different sources can be comparable.

External validation

This validation is performed by the GFCM Secretariat to assess the quality of data transmitted by countries. The Secretariat will:

- check the completeness of data collected;
- identify deficiencies in the data transmissions;
- check differences between countries;
- check problems connected with the quality of existing data, their completeness and the level of comparability;
- check comparability with other sources of information/reference;
- identify significant discontinuities in time of collected data;
- identify significant outcomes.

In particular the external validation aims at taking into consideration a set of indicators. This validation is carried out under the guidance of relevant GFCM subsidiary bodies and in accordance with the decisions taken by the GFCM:

INDICATORS	DEFINITION	CHECKS
TIMELINESS	Data transmission by CPCs meets the deadlines set under relevant recommendations.	• Number of days between the transmission of each data table and the deadline set by relevant recommendations
COMPLETENESS	All data transmitted by CPCs contain all mandatory information as required under relevant recommendations	• Percentage of missing values (mandatory fields) for each data table
CONFORMITY	The data transmitted by CPCs adhere to GFCM standards (codification and format).	• Percentage of data rows with anomalous values for each data table

INDICATORS	DEFINITION	CHECKS
STABILITY	The data transmitted by CPCs vary within acceptable limits compared with the values of the same variables in the recent past.	• Percentage of data rows with values outside the expected range in each data table over time
CONSISTENCY	The data transmitted by CPCs are coherent with the values of similar variables reported in different data tables for the same reference year. The data analysis includes checks with similar variables from other official data sources.	• Number of data rows with incoherent values (data fields) in relevant data tables
ACCURACY	The data transmitted by CPCs are close to a realistic or expected value (sampling coverage, precision and bias checks). The data analysis includes the identification of possible outliers, i.e. values that are outside predefined bounds of statistical control, as well as of any variation in the time series that could imply changes in the methodology or errors in data transmission.	• Number of strata with low sampling effort • Number of strata with high dispersion indices • Number of outliers
ADEQUACY	The data transmitted by CPCs allow relevant GFCM subsidiary bodies to provide scientific advice upon request of the Commission. The adequacy of data should be regularly evaluated both at the national and regional levels. Relevant GFCM subsidiary bodies should make proposals to improve the adequacy standards for the data that are needed for the purpose of scientific advice formulation.	

The results of the external evaluation will be transmitted to the countries, so as to obtain their feedback and overcome any problems identified.

Chapter 9 - Data confidentiality and access policy

One of the key issues considered within the GFCM-DCRF is data confidentiality. In the context of regional data collection, there is a need for a series of common principles for data sharing and dissemination, to ensure confidentiality protection. These principles recall the concept of privacy viewed as a basic human right by the United Nations:[25]

Article 12 of the Universal Declaration of Human Rights
(General Assembly of the United Nations, 1948)
"No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honor and reputation. Everyone has the right to the protection of the law against such interference or attacks."

In this sense, the GFCM will, through its Secretariat, define and maintain high levels of protection for the data transmitted by CPCs complying with the GFCM data transmission requirements, as endorsed by the Commission. To this extent, the Secretariat established dedicated online platforms, in line with recent trends at UN-level in terms of secure, flexible and cost-effective IT solutions supporting online cooperative activities and information management.

CPCs will be responsible for the quality and completeness of the data sent to the GFCM. Data and information transmitted by CPCs will be treated by the GFCM Secretariat in accordance with all necessary measures to comply with GFCM security and confidentiality provisions. Once collected and validated by the GFCM Secretariat, data shall be made publicly available to selected audience, in accordance with the following criteria:

Data confidentiality status (DCS)

		P	S	R
		Public	**Semi-private**	**Private**
Online authentication	Audience	Not sensitive information	Partially sensitive information	Sensitive information
No	General public	Yes	No	No
Yes	GFCM meetings attendees	Yes	Yes	No
	SAC, WGBS and GFCM bureau, GFCM Secretariat, users of the DCRF online platform designated by national authorities of CPCs	Yes	Yes	Yes

These criteria may be applied to both raw and aggregated data as defined in the related GFCM decisions and according to the security provision defined by the Commission. Particular attention will be given to crucial requirements such as the flexibility to address emerging needs in data transmission, cost-efficiency, service levels, data security, and privacy provisions in compliance with relevant standards.

[25] Matthews, G. J. & Harel, O. Data confidentiality: A review of methods for statistical disclosure limitation and methods for assessing privacy. Statistics Surveys 5 (2011), 1--29. doi:10.1214/11-SS074. *http://projecteuclid.org/euclid.ssu/1296828958*

Chapter 10 - Data transmission

The data transmission to the GFCM Secretariat is meant to be performed by CPCs through the dedicated DCRF online platform, available within the GFCM extranet. This online system will allow CPCs to manage the data transmission procedures, in accordance with most of the fisheries data requirements defined in several GFCM Recommendations, and facilitate the communication with the GFCM Secretariat.

The overall online system will be equipped with an automated reminder to better assist CPCs in complying with GFCM data transmission requirements, within deadlines endorsed at Commission level. Moreover, data validation mechanisms will be progressively put in place to ensure compliance with GFCM codifications, standards and data transmission requirements (such as compulsory fields). The aim is to provide CPCs with a familiar and secure environment where the following services are delivered to national eligible users, for the sake of data transmission, through a single access credential system:

- Secure data transmission tools leveraging a flexible and cost-effective infrastructure;
- Online guide in English and French with an introduction for each data table and relevant descriptions for the data fields to compile and the codification standards to comply with;
- At-a-glance compliance reporting system, providing countries with an immediate and exhaustive report of their overall compliance level;
- Historical records of data transmission by countries;
- Notification e-mail system (upon data transmission an automatic message is sent to relevant audience of each PCC as well as to the GFCM Secretariat);
- Dynamic dashboards, including charts and interactive tables (to be progressively put at disposal to the users for data consultation purposes, upon validation and import of the transmitted information in the GFCM Secretariat databases).

The design of the DCRF online platform considers different potential scenarios of data transmission workflows at the national level. If several persons are in charge of various data topics on the basis of roles assigned to them by the national authorities of CPCs, respective access policies could be adjusted in order to deliver relevant features only.

Through the DCRF online platform, several data transmission procedures will be made available in accordance to business needs and validation mechanisms entailed (online forms, upload of predefined Excel/Word templates).

A P P E N D I C E S

Appendix A - Priority species (2021)

A.1 - Group 1 species. Species that drive the fishery and for which assessment is regularly carried out.

			Western Mediterranean Sea	**Central Mediterranean Sea**	**Adriatic Sea**	**Eastern Mediterranean Sea**	**Black Sea**
		GFCM subregions ►					
		GSAs ►	*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11*	*12, 13, 14, 15, 16, 19, 20, 21*	*17, 18*	*22, 23, 24, 25, 26, 27*	*28, 29, 30*
		Countries ►	*Algeria, France, Italy, Monaco, Morocco, Spain*	*Italy, Greece, Libya, Malta, Tunisia*	*Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia*	*Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arab Republic, Turkey*	*Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)**
Species	**Scientific name**	**FAO 3-alpha code**					
Pelagics	*Engraulis encrasicolus*	ANE	X	X	X	X	X
	Sardina pilchardus	PIL	X	X	X	X	
	Sardinella aurita	SAA	X	X		X	
	Sprattus sprattus	SPR					X
	Trachurus mediterraneus	HMM					X
Demersal	*Aristeus antennatus*	ARA		X		X	
	Aristaeomorpha foliacea	ARS		X		X	
	Lagocephalus sceleratus	LFZ	X	X	X	X	
	Merlangius merlangus	WHG					X
	Merluccius merluccius	HKE	X	X	X	X	
	Mullus barbatus	MUT		X	X	X	X
	Nephrops norvegicus	NEP			X		
	Pagellus bogaraveo	SBR	X				
	Parapenaeus longirostris	DPS	X	X	X		
	Pterois miles	UHQ	X	X	X	X	
	Rapana venosa	RPW					X
	Scophthalmus maximus	TUR					X
	Sepia officinalis	CTC			X		

			GFCM subregions ►	**Western Mediterranean Sea**	**Central Mediterranean Sea**	**Adriatic Sea**	**Eastern Mediterranean Sea**	**Black Sea**
			GSAs ►	*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11*	*12, 13, 14, 15, 16, 19, 20, 21*	*17, 18*	*22, 23, 24, 25, 26, 27*	*28, 29, 30*
			Countries ►	*Algeria, France, Italy, Monaco, Morocco, Spain*	*Italy, Greece, Libya, Malta, Tunisia*	*Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia*	*Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arab Republic, Turkey*	*Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)**
Species	**Scientific name**	**FAO 3-alpha code**						
Demersal	*Solea solea*	SOL				X		
	Squalus acanthias[26]	DGS						X
	Squilla mantis	MTS				X		
Additional species**	*Anguilla anguilla*	ELE		X	X	X	X	
	Corallium rubrum	COL		X	X	X	X	
	Coryphaena hippurus	DOL		X	X	X	X	
	Saurida lessepsianus[27]	SZX					X	

** All States, including those that are not-CPCs and which are known to fish in the GFCM area of application, are encouraged to cooperate in joint actions undertaken in accordance with applicable international obligations (i.e. Article 63 UNCLOS).*
*** as identified by the Mid-term strategy (2017-2020) towards the sustainability of Mediterranean and Black Sea fisheries.*

[26] Species included in Appendix III (species whose exploitation is regulated) of the Barcelona Convention (protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean).
[27] The species is not currently present in the ASFIS list and therefore the 3-alpha code of its genus (Saurida spp) has been used.

A.2 - Group 2 species. Species which are important in terms of landing and/or economic values at regional and subregional level, and for which assessment is not regularly carried out.

		Western Mediterranean Sea	**Central Mediterranean Sea**	**Adriatic Sea**	**Eastern Mediterranean Sea**	**Black Sea**
GFCM subregions ►						
GSAs ►		*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11*	*12, 13, 14, 15, 16, 19, 20, 21*	*17, 18*	*22, 23, 24, 25, 26, 27*	*28, 29, 30*
Countries ►		*Algeria, France, Italy, Monaco, Morocco, Spain*	*Italy, Greece, Libya, Malta, Tunisia*	*Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia*	*Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arab Republic, Turkey*	*Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)**
Scientific name	**FAO 3-alpha code**					
Alosa immaculata	SHC					X
Aristeus antennatus	ARA		X		X	
Boops boops	BOG	X	X	X	X	
Chamelea gallina	SVE			X		
Diplodus annularis	ANN		X			
Eledone cirrhosa	EOI	X		X		
Eledone moschata	EDT			X		
Galeus melastomus	SHO	X				
Lophius budegassa	ANK	X	X			
Micromesistius poutassou	WHB	X				
Mullus surmuletus	MUR	X	X		X	
Octopus vulgaris	OCC	X	X	X	X	
Pagellus erythrinus	PAC	X	X	X	X	
Raja asterias	JRS	X				
Raja clavata	RJC	X	X			
Sarda sarda	BON					X
Saurida undosquamis	LIB				X	
Scomber japonicus	MAS	X			X	
Scomber scombrus	MAC	X	X			
Sepia officinalis	CTC			X		

		Western Mediterranean Sea	**Central Mediterranean Sea**	**Adriatic Sea**	**Eastern Mediterranean Sea**	**Black Sea**
	GFCM subregions ►					
	GSAs ►	*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11*	*12, 13, 14, 15, 16, 19, 20, 21*	*17, 18*	*22, 23, 24, 25, 26, 27*	*28, 29, 30*
	Countries ►	*Algeria, France, Italy, Monaco, Morocco, Spain*	*Italy, Greece, Libya, Malta, Tunisia*	*Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia*	*Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arab Republic, Turkey*	*Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)**
Scientific name	**FAO 3-alpha code**					
Siganus luridus	IGU				X	
Siganus rivulatus	SRI				X	
Solea solea	SOL			X		
Sphyraena sphyraena	YRS		X			
Spicara smaris	SPC			X	X	
Trachurus mediterraneus	HMM					X
Trachurus picturatus	JAA	X				
Trachurus trachurus	HOM	X	X		X	

** All States, including non- CPCs of the GFCM which are known to fish in its competence area, are encouraged to cooperate in joint actions undertaken in accordance with applicable international obligations (i.e. Article 63 UNCLOS).*

A.3 - Group 3 species. Species within international/ national management plans and recovery and/or conservation action plans; non-indigenous species with the greatest potential impact.

		Western Mediterranean Sea	**Central Mediterranean Sea**	**Adriatic Sea**	**Eastern Mediterranean Sea**	**Black Sea**
	GFCM subregions ►					
	GSAs ►	*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11*	*12, 13, 14, 15, 16, 19, 20, 21*	*17, 18*	*22, 23, 24, 25, 26, 27*	*28, 29, 30*
	Countries ►	*Algeria, France, Italy, Monaco, Morocco, Spain*	*Italy, Greece, Libya, Malta, Tunisia*	*Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia*	*Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arab Republic, Turkey*	*Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)***
Scientific name	**FAO 3-alpha code**					
Callinectes sapidus	CRB	X	X	X	X	
Dalatias licha	SCK	X	X	X	X	
Dipturus oxyrinchus	RJO	X	X	X	X	
Etmopterus spinax	ETX	X	X	X	X	
Galeus melastomus	SHO		X	X	X	
Hexanchus griseus	SBL	X	X	X	X	
*Mustelus asterias**	SDS	X	X	X	X	
*Mustelus mustelus**	SMD	X	X	X	X	
*Mustelus punctulatus**	MPT	X	X	X	X	
Myliobatis aquila	MYL	X	X	X	X	
Portunus segnis	QSO	X	X	X	X	
*Prionace glauca**	BSH	X	X	X	X	
Pteroplatytrygon violacea	PLS	X	X	X	X	
Raja asterias	JRS		X	X	X	
Raja clavata	RJC			X	X	X
Raja miraletus	JAI	X	X	X	X	
Scyliorhinus canicula	SYC	X	X	X	X	X
Scyliorhinus stellaris	SYT	X	X	X	X	
*Squalus acanthias**	DGS	X	X	X	X	

		GFCM subregions ►	**Western Mediterranean Sea**	**Central Mediterranean Sea**	**Adriatic Sea**	**Eastern Mediterranean Sea**	**Black Sea**
		GSAs ►	*1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11*	*12, 13, 14, 15, 16, 19, 20, 21*	*17, 18*	*22, 23, 24, 25, 26, 27*	*28, 29, 30*
		Countries ►	*Algeria, France, Italy, Monaco, Morocco, Spain*	*Italy, Greece, Libya, Malta, Tunisia*	*Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia*	*Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arab Republic, Turkey*	*Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)***
Scientific name	**FAO 3-alpha code**						
Squalus blainville	QUB		X	X	X	X	
Torpedo marmorata	TTR		X	X	X	X	
Torpedo torpedo	TTV		X	X	X	X	
Fistularia commersonii	FIO					X	
Marsupenaeus japonicus	KUP					X	
Metapenaeus stebbingi	MNG					X	
Scomberomorus commerson	COM					X	

** Species included in Appendix III (species whose exploitation is regulated) of the Barcelona Convention (protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean).*

***All States, including non-CPCs of the GFCM which are known to fish in its competence area, are encouraged to cooperate in joint actions undertaken in accordance with applicable international obligations (i.e. Article 63 UNCLOS).*

Appendix B - Fleet segments
(Combination of vessel groups and length classes)

Vessel groups			Length classes (LOA)			
			< 6 m	**6 - 12 m**	**12-24 m**	**> 24 m**
Polyvalent	**P**	Small-scale vessels without engine using passive gear	**P-01**	**P-02**	**P-03**	**P-04**
			P-13			
		Small-scale vessels with engine using passive gear	**P-05**	**P-06**	**P-07**	**P-08**
		Polyvalent vessels	**P-09**	**P-10**	**P-11**	**P-12**
					P-14	
Seiners	**S**	Purse seiners	**S-01**	**S-02**	**S-03**	**S-04**
					S-09	
		Tuna seiners	**S-05**	**S-06**	**S-07**	**S-08**
					S-10	
Dredgers	**D**	Dredgers	**D-01**	**D-02**	**D-03**	**D-04**
				D-05		
Trawlers	**T**	Beam trawlers	**T-01**	**T-02**	**T-03**	**T-04**
		Pelagic trawlers	**T-05**	**T-06**	**T-07**	**T-08**
				T-13		
		Trawlers	**T-09**	**T-10**	**T-11**	**T-12**
Longliners	**L**	Longliners	**L-01**	**L-02**	**L-03**	**L-04**
				L-05		

Notes:

- *A vessel is assigned to a group on the basis of the dominant gear used in terms of percentage of time: more than 50 percent of the time at sea using the same fishing gear during the year.*
- *"Polyvalent vessels" are defined as all the vessels using more than one gear, with a combination of passive and active gear, none of which exceeding more than 50 percent of the time at sea during the year.*
- *A vessel is considered "active" when it executes at least one fishing operation during the reference year in the GFCM area of application.*
- *The yellow cells contain the codes of reported fleet segments which should be included in the GFCM data transmission. If necessary, fleet segments as identified in the orange cells can be used: P-13 (P-01 + P-02), P-14 (P-11 + P-12), S-09 (S-03 + S-04), S-10 (S-07 + S-08), D-05 (D-02 + D-03), T-13 (T-06 + T-07 + T-08) and L-05 (L-02 + L-03 + L-04). Any proposal for a different aggregation of fleet segments should be brought to the attention of the relevant GFCM subsidiary bodies, mentioning the rationale and corresponding references (e.g. existing scientific studies), which in turn should confirm the similarity/homogeneity of the combined cells.*

Appendix C - Fisheries Restricted Areas (FRAs)

A Fisheries Restricted Area (FRA) is ***a geographically-defined area in which all or certain fishing activities are temporarily or permanently banned or restricted in order to improve the exploitation and conservation of harvested living aquatic resources or the protection of marine ecosystems.***

In the recent years, the GFCM has established FRAs with different types and levels of restriction (i.e. fishing effort limit; time limit; buffer areas, etc.). In the following FRAs, fishing activity is allowed with different types of restrictions and temporal limitations.

Name of FRA	Code	Country	GSA	km^2
Gulf of Lion	**LI**	France, Spain	07	3,741.6
Jabuka/Pomo Pit	**JP**	Italy, Croatia	17	3,143

Gulf of Lion*

For demersal stocks, fishing effort of vessels using towed nets, bottom and midwater longlines and/or bottom-set nets shall not exceed the level of the fishing effort applied in 2008 in the FRA of the eastern Gulf of Lion, as bounded by lines joining the following geographic coordinates (Recommendation GFCM/33/2009/1):

Coordinates
42°40'N, 4°20' E;
42°40'N, 5°00' E;
43°00'N, 4°20' E;
43°00'N, 5°00' E;

Jabuka/Pomo Pit

As per Recommendation GFCM/41/2017/3, in the FRA of Jabuka/Pomo Pit fishing activities are permanently prohibited in Zone A (any professional fishing activity with bottom-set nets, bottom trawls, set longlines and traps is prohibited), whilst in Zone B and C some activities are temporarily prohibited as follows:

- **Zone B** Fishing activities with bottom-set nets, bottom trawls, set longlines and traps shall be prohibited in zone B, from 1 September to 31 October each year and
- **Zone C** Fishing activities with bottom-set nets, bottom trawls, set longlines and traps and recreational fisheries shall be prohibited from 1 September to 31 October each year

ZONE B		ZONE C	
43°03,477' N	14°54,982' E	43°17,436' N	15°29,496' E
42°49,811' N	14°29,550' E	43°24,758' N	15°33,215' E
42°35,205' N	14°59,611' E	43°20,345' N	15°47,012' E
42°49,668' N	15°05,802' E	43°18,150' N	15°51,362' E
42°50,450' N	15°07,431' E	43°13,984' N	15°55,232' E
		43°12,873' N	15°52,761' E
		43°13,494' N	15°40,040' E

** DCRF table IV.3 applies to the Gulf of Lion only since data requirements for Jabuka/Pomo Pit are currently subject to the ongoing DCRF harmonization process*

Appendix D - Fishing gear[28]

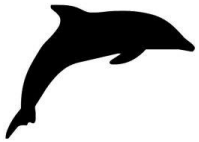
Fishing gear		Code
Surrounding nets	Purse seines	**PS**
	Surrounding nets (nei)	**SUX**
	Surrounding nets without purse lines	**LA**
Seine nets	Beach seines	**SB**
	Boat seines	**SV**
	Seine nets (nei)	**SX**
Trawls	Beam trawls	**TBB**
	Bottom pair trawls	**PTB**
	Bottom trawls (nei)	**TB**
	Midwater pair trawls	**PTM**
	Midwater trawls (nei)	**TM**
	Multiple bottom otter trawls	**OTP**
	Single boat bottom otter trawls	**OTB**
	Single boat midwater otter trawls	**OTM**
	Trawls (nei)	**TX**
	Twin bottom otter trawls	**OTT**
Dredges	Hand dredges	**DRH**
	Mechanised dredges	**DRM**
	Towed dredges	**DRB**
Gillnets and entangling nets	Combined gillnets-trammel nets	**GTN**
	Drift gillnets	**GND**
	Encircling gillnets	**GNC**
	Fixed gillnets (on stakes)	**GNF**
	Gillnets and entantling nets (nei)	**GEN**
	Set gillnets (anchored)	**GNS**
	Trammel nets	**GTR**
Traps	Aerial traps	**FAR**
	Barrier, fences, weirs, etc	**FWR**
	Fyke nets	**FYK**
	Pots	**FPO**
	Stationary uncovered pound nets	**FPN**
	Stow nets	**FSN**
	Traps (nei)	**FIX**
Hooks and lines	Drifting longlines	**LLD**
	Handlines and hand-operated pole-and-lines	**LHP**
	Hooks and lines (nei)	**LX**
	Longlines (nei)	**LL**
	Mechanized lines and pole-and-lines	**LHM**
	Set longlines	**LLS**
	Trolling lines	**LTL**
	Vertical lines	**LVT**

[28] International Standard Statistical Classification of Fishing Gear (ISSCFG, 2016)

Fishing gear		Gear code
Miscellaneous gear	Diving	**MDV**
	Drive-in nets	**MDR**
	Electric fishing	**MEL**
	Gear nei	**MIS**
	Hand implements (Wrenching gear, Clamps, Tongs, Rakes, Spears)	**MHI**
	Harpoons	**HAR**
	Pumps	**MPM**
	Pushnets	**MPN**
	Scoopnets	**MSP**

Appendix E - Vulnerable species

E.1 - Vulnerable species. List of vulnerable species included in Appendix II (endangered or threatened species) and Appendix III (species whose exploitation is regulated) of the Barcelona Convention (*Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*). The list also contains the Amendments of Annexes II and III of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (2012/510/EU: *Council Decision of 10 July 2012, establishing the position to be adopted on behalf of the European Union with regard to the amendments to Annexes II and III to the Protocol concerning Specially Protected Areas and Biological Diversity SPA/BD in the Mediterranean of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, adopted by the seventeenth meeting of the Contracting Parties, Paris, France, 8-10 February 2012*).

Group of vulnerable species	Family	Species	Common name
Cetaceans 	Balaenopteridae	*Balaenoptera acutorostrata*	Common minke whale
		Balaenoptera borealis	Sei whale
		Balaenoptera physalus	Fin whale
		Megaptera novaeangliae	Humpback whale
	Balenidae	*Eubalaena glacialis*	North Atlantic right whale
	Physeteridae	*Physeter macrocephalus*	Sperm whale
		Kogia sima	Dwarf sperm whale
	Phocoenidae	*Phocoena phocoena*	Harbour porpoise
	Delphinidae	*Steno bredanensis*	Rough-toothed dolphin
		Grampus griseus	Risso's dolphin
		Tursiops truncatus	Common bottlenose dolphin
		Stenella coeruleoalba	Striped dolphin
		Delphinus delphis	Common dolphin
		Pseudorca crassidens	False killer whale
		Globicephala melas	Long-finned pilot whale
		Orcinus orca	Killer whale
	Ziphiidae	*Ziphius cavirostris*	Cuvier's beaked whale
		Mesoplodon densirostris	Blainville's beaked whale
Seals	Phocidae	*Monachus monachus*	Mediterranean monk seal

Group of vulnerable species	Family	Species	Common name
Sharks, Rays, Chimaeras 	Alopiidae	*Alopias vulpinus*	Common thresher
	Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark
		Carcharodon carcharias	Great white shark
		Prionace glauca	Blue shark
	Centrophoridae	*Centrophorus granulosus*	Gulper shark
	Cetorhinidae	*Cetorhinus maximus*	Basking shark
	Gymnuridae	*Gymnura altavela*	Spiny butterfly ray
	Hexanchidae	*Heptranchias perlo*	Sharpnose sevengill shark
	Lamnidae	*Isurus oxyrinchus*	Shortfin mako
		Lamna nasus	Porbeagle
	Myliobatidae	*Mobula mobular*	Devil fish
	Odontaspididae	*Odontaspis ferox*	Small-tooth sand tiger shark
		Carcharias taurus	Sand tiger
	Oxynotidae	*Oxynotus centrina*	Angular rough shark
	Pristidae	*Pristis pectinata*	Smalltooth sawfish
		Pristis pristis	Common sawfish
	Rajidae	*Dipturus batis*	Blue skate
		Leucoraja circularis	Sandy ray
		Leucoraja melitensis	Maltese skate
		Rostroraja alba	White skate
	Rhinobatidae	*Rhinobatos cemiculus*	Blackchin guitarfish
		Rhinobatos rhinobatos	Common guitarfish
	Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead
		Sphyrna mokarran	Great hammerhead
		Sphyrna zygaena	Smooth hammerhead
	Squatinidae	*Squatina aculeata*	Sawback angelshark
		Squatina oculata	Smoothback angelshark
		Squatina squatina	Angelshark
	Triakidae	*Galeorhinus galeus*	School/Tope shark

Group of vulnerable species	Family	Species	Common name
Seabirds 	Falconidae	*Falco eleonorae*	Eleonora's falcon
	Alcedinidae	*Ceryle rudis*	Pied kingfisher
		Halcyon smyrnensis	White-throated kingfisher
	Charadriidae	*Charadrius alexandrinus*	Kentish plover
		Charadrius leschenaultii columbinus	Greater sand plover
	Hydrobatidae	*Hydrobates pelagicus**	European storm-petrel (Mediterranena)
		*Hydrobates pelagicus melitensis**	European storm-petrel
	Laridae	*Larus audouinii**	Audouin's gull
		*Larus armenicus**	Armenian gull
		*Larus genei**	Slender-billed gull
		*Larus melanocephalus **	Mediterranean gull
		*Sternula albifrons**	Little tern
		*Thalasseus bengalensis**	Lesser crested tern
		*Thalasseus sandvicensis**	Sandwich tern
		*Hydroprogne caspia**	Caspian tern
		*Gelochelidon nilotica**	Common Gull-billed tern
	Pandionidae	*Pandion haliaetus*	Osprey
	Pelecanidae	*Pelecanus crispus*	Dalmatian pelican
		Pelecanus onocrotalus	Great white pelican
	Phalacrocoracidae	*Gulosus aristotelis desmarestii*	European shag (Mediterranenan)
		Microcarbo pygmaeus	Pygmy cormorant
	Phoenicopteridae	*Phoenicopterus roseus*	Greater flamingo
	Procellariidae	*Calonectris diomedea**	Scopoli's shearwater
		*Calonectris borealis**	Cory’s shearwater
		*Puffinus yelkouan**	Yelkouan shearwater
		*Puffinus mauretanicus**	Balearic shearwater
	Scolopacidae	*Numenius tenuirostris*	Slender-billed curlew

*The only birds which can be considered as seabirds. The other species in the table are mentioned as “aves” in Annex II of the Barcelona Convention. Some of them belong to the so-called water-bird or aquatic bird (e.g. birds that inhabit or depend on bodies of water or wetland areas).

Group of vulnerable species	Family	Species	Common name
Sea turtles 	Cheloniidae	*Caretta caretta*	Loggerhead turtle
		Chelonia mydas	Green turtle
		Eretmochelys imbricata	Hawksbill Turtle
		Lepidochelys kempii	Kemp's ridley sea turtle
		Lepidochelys olivacea	Olive ridley sea turtle
	Dermochelyidae	*Dermochelys coriacea*	Leatherback sea turtle
	Trionychidae	*Trionyx triunguis*	African softshell turtle

E.2 - Rare elasmobranchs species. This list reports elasmobranchs species that are included in the IUCN Red List of Threatened species (www.iucnredlist.org) or that are considered rare in the Mediterranean and the Black Sea (Bradai *et al.*, 2012).

Group of rare species	Family	Species	Common name
Sharks, Rays, Chimaeras 	Alopiidae	*Alopias superciliosus*	Bigeye thresher
	Hexanchidae	*Hexanchus nakamurai*	Bigeye sixgill shark
	Echinorhinidae	*Echinorhinus brucus*	Bramble shark
	Squalidae	*Squalus megalops*	Shortnose spurdog
	Centrophoridae	*Centrophorus uyato*	Little gulper shark
	Somniosidae	*Centroscymnus coelolepis*	Portugese dogfish
		Somniosus rostratus	Little sleeper shark
	Lamnidae	*Isurus paucus*	Longfin mako
	Scyliorhinidae	*Galeus atlanticus*	Atlantic sawtail catshark
	Carcharhinidae	*Carcharhinus altimus*	Bignose shark
		Carcharhinus brachyurus	Bronze whaler shark
		Carcharhinus brevipinna	Spinner shark
		Carcharhinus falciformis	Silky shark
		Carcharhinus limbatus	Blacktip shark
		Carcharhinus melanopterus	Blacktip reef shark
		Carcharhinus obscurus	Dusky shark
		Galeocerdo cuvier	Tiger shark
		Rhizoprionodon acutus	Milk shark
	Torpedinidae	*Tetronarce nobiliana*	Great torpedo ray
		Torpedo sinuspersici	Variable torpedo ray
	Rajidae	*Dipturus nidarosiensis*	Norwegian skate
		Leucoraja fullonica	Shagreen skate
		Leucoraja naevus	Cuckoo skate
		Raja brachyura	Blonde skate
		Raja montagui	Spotted skate
		Raja polystigma	Speckled skate
		Raja radula	Rough skate
		Raja undulata	Undulate skate
	Dasyatidae	*Bathytoshia centroura*	Roughtail stingray
		Dasyatis marmorata	Marbled stingray
		Dasyatis pastinaca	Common stingray
		Dasyatis tortonesei	Tortonese's stingray
		Himantura uarnak	Honeycomb whipray
		Taeniura grabata	Round stingray
	Myliobatidae	*Aetomylaeus bovinus*	Bullray
	Rhinopteridae	*Rhinoptera marginata*	Lusitanian cownose ray
	Sphyrnidae	*Sphyrna tudes*	Smalleye hammerhead

Appendix F - Fishing effort measurement

Mandatory

F.1 - Effort measurement by fleet segment

Fleet segments			Effort measurements		
Vessel groups		Length classes (LOA)	Unit of capacity	Unit of activity	Nominal effort
P	Small-scale vessels without engine using passive gear Small-scale vessels with engine using passive gear Polyvalent vessels	All	Net length [29] [30]	Fishing days	Net length x Fishing days
			Number of traps/pots [30]	Fishing days	Number of traps/pots x Fishing days
			Number of lines [30]	Fishing days	Number of lines x Fishing days
S	Purse seiners Tuna seiners	All	GT	Number of fishing sets [31] [32]	GT x Number of fishing sets
D	Dredgers	All	GT	Fishing days	GT x Fishing days
T	Beam trawlers Pelagic trawlers Trawlers	All	GT	Fishing days	GT x Fishing days
L	Long liners	All	Number of hooks [30]	Fishing days	Number of hooks x Fishing days

[29] Length of net expressed in 100-metre units (FAO)
[30] Should this information not be available, "GT" may be used as capacity unit upon approval by relevant GFCM subsidiary bodies on a case-by-case basis.
[31] Number of times the gear has been set or shot, whether or not a catch was made (FAO)
[32] Should this information not be available, "fishing days" may be used as activity unit upon approval by relevant GFCM subsidiary bodies on a case-by-case basis.

F.2 - Effort measurement by fishing gear

Fishing gear		Gear code	Unit of capacity	Unit of activity	Nominal effort
Surrounding nets	Purse seines	PS	GT	Number of fishing sets [33] [34]	GT x Number of fishing sets
	Surrounding nets without purse lines	LA			
	Surrounding nets (nei)	SUX			
Seine nets	Beach seines	SB	Net length [35] [36]	Fishing days	Net length x Fishing days
	Boat seines	SV			
	Seine nets (nei)	SX			
Trawls	Beam trawls	TBB	GT	Fishing days	GT x Fishing days
	Bottom pair trawls	PTB			
	Bottom trawls (nei)	TB			
	Midwater pair trawls	PTM			
	Midwater trawls (nei)	TM			
	Multiple bottom otter trawls	OTP			
	Single boat bottom otter trawls	OTB			
	Single boat midwater otter trawls	OTM			
	Trawls (nei)	TX			
	Twin bottom otter trawls	OTT			
Dredges	Hand dredges	DRH	GT	Fishing days	GT x Fishing days
	Mechanised dredges	DRM			
	Towed dredges	DRB			
Gillnets and Entangling Nets	Combined gillnets-trammel nets	GTN	Net length [35] [36]	Fishing days	Net length x Fishing days
	Drift gillnets	GND			
	Encircling gillnets	GNC			
	Fixed gillnets (on stakes)	GNF			
	Gillnets and entantling nets (nei)	GEN			
	Set gillnets (anchored)	GNS			
	Trammel nets	GTR			

[33] Number of times the gear has been set or shot, whether or not a catch was made (FAO)
[34] Should this information not be available, "fishing days" may be used as activity capacity upon approval by relevant GFCM subsidiary bodies on a case-by-case basis.
[35] Length of net expressed in 100-metre units (FAO)
[36] Should this information not be available, "GT" may be used as capacity unit upon approval by relevant GFCM subsidiary bodies on a case-by-case basis

Fishing gear		Gear code	Unit of capacity	Unit of activity	Nominal effort
Traps	Aerial traps	FAR	Number of traps/pots [36]	Fishing days	Number of traps/pots x Fishing days
	Barrier, fences, weirs, etc	FWR			
	Fyke nets	FYK			
	Pots	FPO			
	Stationary uncovered pound nets	FPN			
	Stow nets	FSN			
	Traps (nei)	FIX			
Hooks and Lines	Handlines and hand-operated pole-and-lines	LHP	Number of lines [36]	Fishing days	Number of lines x Fishing days
	Mechanized lines and pole-and-lines	LHM			
	Trolling lines	LTL			
	Vertical lines	LVT			
	Drifting longlines	LLD	Number of hooks [36]	Fishing days	Number of hooks x Fishing days
	Hooks and lines (nei)	LX			
	Longlines (nei)	LL			
	Set longlines	LLS			
Miscellaneous gear	Diving	MDV	Number / Length / GT	Fishing days	Number / Length / GT x Fishing days
	Drive-in nets	MDR			
	Electric fishing	MEL			
	Gear nei	MIS			
	Hand implements (Wrenching gear, Clamps, Tongs, Rakes, Spears)	MHI			
	Harpoons	HAR			
	Pumps	MPM			
	Pushnets	MPN			
	Scoopnets	MSP			

Appendix G - Scales of maturity stages

G.1 - *Bony fish*

Stages	Maturation state	Reproductive apparatus aspect	
0	UNDETERMINED	Sex not distinguished by naked eye. Gonads very small and translucent, almost transparent. Sex undetermined.	
		Females	*Males*
1	IMMATURE-VIRGIN	Small pinkish and translucent ovary shorter than 1/3 of body cavity. Eggs not visible to naked eye.	Thin and whitish testis shorter than 1/3 of body cavity.
2a	VIRGIN-DEVELOPING	Small pinkish/reddish ovary shorter than 1/2 of body cavity. Eggs not visible to naked eye.	Thin whitish testis shorter than 1/2 of body cavity.
2b	RECOVERING	Pinkish-reddish/reddish-orange and translucent ovary; length about 1/2 of body cavity. Blood vessels visible. Eggs not visible to naked eye.	Whitish/pinkish testis, more or less symmetrical; length about 1/2 of body cavity.
2c	MATURING	Ovary pinkish-yellow in colour with granular appearance; length about 2/3 of body cavity. Eggs are visible to naked eye through the *ovaric tunica*, which is not yet translucent. Under light pressure, eggs are not expelled.	Whitish to creamy testis; length about 2/3 of body cavity. Under light pressure, sperm is not expelled.
3	MATURE/SPAWNER	Ovary orange-pink in colour, with conspicuous superficial blood vessels; length from 2/3 to full length of body cavity. Large transparent, ripe eggs are clearly visible and could be expelled under light pressure. In more advanced conditions, eggs escape freely.	Whitish-creamy soft testis; length from 2/3 to full length of body cavity. Under light pressure, sperm could be expelled. In more advanced conditions, sperm escapes freely.
4a	SPENT	Reddish ovary shrunk to about 1/2 length of body cavity. Flaccid ovaric walls; ovary may contain remnants of disintegrating opaque and/or translucent eggs.	Bloodshot and flabby testis shrunk to about 1/2 length of body cavity.
4b	RESTING	Pinkish and translucent ovary; length about 1/3 of body cavity. Eggs not visible to naked eye.	Whitish/pinkish testis, more or less symmetrical; length about 1/3 of body cavity.

G.2 - *Cephalopods*

Stages	Maturation state	Reproductive apparatus aspect	Sex
0	Undetermined	Sex not distinguished by naked eye. Sex undetermined.	U
1	Immature-Virgin	Small and translucent Nidamental glands (NG)/Oviducal glands (OG). Ovary is semi-transparent, stringy and lacking granular structure. Small semi-transparent NG/OG. Oviduct meander not visible. Total absence of spermatophores.	F
		Testis small. Spermatophoric complex (SC) semi-transparent; Vas deferens not visible. Penis appears as a small prominence of SC.	M
2a	Developing	NG/OVG enlarged. NG covering some internal organs. Whitish ovary with granular structure clearly visible, not reaching the posterior half of the mantle cavity. Oviduct meander clearly visible. Eggs very small. Absence of spermatophores.	F
		Enlarged testis with structure not clearly visible. Vas deferens is whitish or white and the spermatophoric organ has white streak.	M
2b	Maturing	Large NG covering the viscera below. Ovary occupies the whole posterior half of mantle cavity, containing reticulated oocytes of all sizes tightly packed and probably a few ripe ova at its proximal part. Oviducts fully developed but empty. Maturing eggs visible to naked eye. Few spermatophores.	F
		Vas deferens is white, meandering, enlarged. Needham's sac (SS) with structure less whitish particles inside. Normally the Needham's sac is without functional spermatophores, but sometimes some immature/abortive ones could occur. Testis tight, crispy, with visible structure.	M
3a	Mature	Large NG as previously. Ovary containing higher percentage of large reticulated eggs and some large ripe ova with smooth surface. In Teuthoidea ripe ova in oviducts. Eggs medium and big, and visible both in oviducts and in the ovary. Well-developed spermatophores.	F
		Testis as before. Spermatophores packed in the Needham's sac.	M
3b	Spent	NG/OG large but soft and running. Ovary shrunk and flaccid, with only immature oocytes attached to the central tissue and a few loose large ova in the coelom. In Teuthoidea, oviduct may contain some mature ova but are no longer packed.	F
		Disintegrating spermatophores in the Needham's sac and the penis.	M

G.3 - *Crustaceans*

Stages	Maturation state	Reproductive apparatus aspect				
		Colouring of fresh ovary	*Parapenaeus longirostris*	*Aristaeomorpha foliacea*	*Aristeus antennatus*	*Nephrops norvegicus*
1	Immature	whitish or translucid	Ovaries not visible without dissection. The ovaries are thin and translucent with a tubular appearance adherent to the dorsal portion of the stomach, not extending to the abdomen.	Ovaries not visible without dissection. The ovaries are thin and translucent with a tubular appearance adherent to the laterals of the stomach, not extending to the abdomen.	Ovaries not visible without dissection. The ovaries are thin and translucent with a tubular appearance adherent to the laterals of the stomach, not extending to the abdomen.	Ovaries not visible without dissection. The ovaries are translucent, thin and threadlike.
2	Developing	*A. foliacea*: flesh coloured; *A. antennatus:* ivory coloured with orange pink-violet dotting; *N. norvegicus*: cream; *P. longirostris*: cream orange;	Ovaries are barely visible without dissection. The cephalic lobes start to cover the sides while the abdominal extensions occupy all somites.	Ovaries barely visible without dissection. Cephalic lobes small but distinguishable. The gonad generally extends up to 3rd abdominal somite.	Ovaries barely visible without dissection. Cephalic lobes small but distinguishable. The gonad extends to the full length of the abdomen.	Ovaries barely visible without dissection. The gonads extends up to the 1st somite of the abdomen and have a granular appearance.
3	Maturing	*A. foliacea*: light and dark grey; *A. antennatus:* lilla; *N. norvegicus*: light green; *P. longirostris*: light green or grey green;	Ovaries are clearly visible through integument. Ovaries developed and turgid, with cephalic lobes and abdominal extensions occupying the entirely the dorsal portion. The gonads appear granular.	Ovaries are clearly visible through integument. Ovaries developed and turgid, with evident cephalic lobes. The gonad generally extends to the 4th abdominal somite	Ovaries are clearly visible through integument. Cephalic and abdominal extensions are well developed and turgid.	Ovaries are clearly visible through integument. The gonad occupies one third of the cephalotoracic space. The gonads extend up to the 1st somite of the abdomen.
4	Mature	*A. foliacea*: black; *A. antennatus:* violet; *N. norvegicus*: dark grey; *P. longirostris*: brightgreen or olive green;	Turgid ovaries extending to the whole dorsal area. Lobes and extensions well developed. Eggs well visible.	Turgid ovaries extending to the whole dorsal area. Lobes well developed and abdominal extensions may reach the 5th somite. Eggs well visible.	Turgid ovaries occupying the whole dorsal area. Lobes and abdominal extensions well developed. Eggs well visible.	Turgid ovaries occupying the whole dorsal cephalotoracic space and extending up to the 2nd somite. Eggs visible.
5	Spent/Resting /Recovering	uncoloured	Ovaries after spawning are fully extended but loose turgidity becoming flaccid.	Ovaries large but flaccid with blackish spots.	Ovaries large but flaccid with purple spots.	Ovaries flaccid with green spots. Re-absorption of ovarian material. Most likely with green eggs on pleopods.

G.4 - *Elasmobranchs oviparous*

Oviparous elasmobranchs		**Females**		**Males**	
MATURATION STATE	STAGES	MATURATION STATE	REPRODUCTIVE APPARATUS ASPECT	MATURATION STATE	REPRODUCTIVE APPARATUS ASPECT
IMMATURE	**1**	IMMATURE	Ovaries: small and whitish. Undistinguishable ovarian follicles. Oviducal gland often not visible. In some species a thickening of the uteri where the gland will develop may be visible. Uteri: thread-like and narrow.	IMMATURE	Claspers: flexible, non-calcified and shorter than pelvic fins. Testes: small and undeveloped (in skates, sometimes with visible lobules). Ducts: straight and thread-like.
	2	DEVELOPING	Ovaries: follicles of different stages of development. Some small and medium-sized yolked follicles may be present. Oviducal gland: distinguishable and developing. Uteri: enlarging.	DEVELOPING	Claspers: flexible, partially calcified and usually as long as or longer than pelvic fins. Testes: developing (in skates, lobules clearly visible but not fully developed). Ducts: developing and beginning to coil.
MATURE	**3a**	CAPABLE OF REPRODUCTION	Ovaries: presence of large yolked follicles ready to be ovulated. Oviducal glands: fully developed. Uteri: fully developed.	CAPABLE OF REPRODUCTION	Claspers: rigid, fully calcified, and longer than pelvic fins (in some sharks they may only be as long as the pelvic fins). Testes: fully developed (in skates, with fully formed lobules). Ducts: tightly coiled and filled with sperm.
	3b	EGG LAYING	Uteri: presence of egg capsules.	ACTIVE	Claspers: similar to stage 3a, however with clasper glands dilated, sometimes swollen and reddish. Sperm may be present in clasper groove or glands. Testes: similar to stage 3a. Ducts: sperm observed inside (after a cut) or flowing out of the cloaca on pressure.
	4a	POST-LAYING	Ovaries: flaccid with few follicles of different sizes. Few large vitellogenic follicles entering atresia. POFs and atretic follicles may be visible. Oviducal glands: fully developed but may be reduced in size. Uteri: enlarged and flaccid.	REGRESSING	Claspers: fully formed, similar to stage 3. Testes shrunken and flaccid, (in skates, with few visible lobules). On pressure sperm does not flow. Sperm ducts: empty and flaccid.
	4b	REGENERATING	Ovaries: large with small and medium-sized yolked follicles. Pre-ovulatory follicles absent. Oviducal glands: fully developed but may be reduced in size. Uteri: enlarged.	-	-

G.4 - *Elasmobranchs viviparous*

Viviparous elasmobranchs		**Females**			**Males**	
MATURATION STATE	STAGES	MATURATION STATE	REPRODUCTIVE APPARATUS ASPECT	STAGES	MATURATION STATE	REPRODUCTIVE APPARATUS ASPECT
IMMATURE	**1**	IMMATURE	Ovaries: small and whitish; undistinguishable ovarian follicles. Oviducal gland: often not visible. In some species a thickening of the uteri where the gland will develop may be visible. Uteri: thread-like and narrow.	**1**	IMMATURE	Claspers: flexible, non-calcified and usually shorter than pelvic fins. Testes: small and undeveloped. Ducts: straight and thread-like.
	2	DEVELOPING	Ovaries: follicles of different stages of development. Some small and medium-sized yolked follicles may be present. Oviducal gland: distinguishable and developing. Uteri: enlarging.	**2**	DEVELOPING	Claspers: flexible, partially calcified and as long as or longer than pelvic fins. Testes: developing and may start to segment in sharks; in rays lobules clearly visible but do not occupy the whole surface. Ducts: developing and beginning to coil.
MATURE	**3**	CAPABLE OF REPRODUCTION	Ovaries: presence of large yolked follicles ready to be ovulated. Oviducal glands: fully developed Uteri: fully developed.	**3a**	CAPABLE OF REPRODUCTION	Claspers: rigid, fully calcified, and longer than pelvic fins. Testes: fully developed; for some shark species testes are fully segmented. Ducts: tightly coiled and filled with sperm.
				3b	ACTIVE	Claspers: similar to stage 3a, however with clasper glands dilated, sometimes swollen. Sperm may be present in clasper groove or glands. Testes: similar to stage 3a. Ducts: sperm observed inside after a cut or flowing out of the cloaca on pressure.
				4	REGRESSING	Claspers: fully formed, similar to stage 3. Testes shrunken and flaccid, (in skates, with few visible lobules). On pressure, sperm does not flow. Sperm ducts: empty and flaccid. Seminal vesicle developed but empty.

G.4 - *Elasmobranchs viviparous*

Viviparous elasmobranchs		**Females**			**Males**	
MATURATION STATE	STAGES	MATURATION STATE	REPRODUCTIVE APPARATUS ASPECT	STAGES	MATURATION STATE	REPRODUCTIVE APPARATUS ASPECT
MATERNAL	**4a**	EARLY PREGNANCY	Uteri: well filled and rounded with yolk content (usually candle shaped). Embryos cannot be observed.	-	-	-
	4b	MID PREGNANCY	Uteri: well filled and rounded. Embryos are always visible, small and with a relatively large yolk sac.	-	-	-
	4c	LATE PREGNANCY	Uteri: embryos fully formed, yolk sacs reduced or absent.	-	-	-
	5	POST-PARTUM	Ovaries: shrunken without follicle development and with atretic (degenerating) follicles. Uteri: enlarged and flaccid.	-	-	-
MATURE	**6**	REGENERATING	Ovaries: large with small and medium-sized yolked follicles. Pre-ovulatory follicles absent. Atretic follicles may be present. Oviducal glands: fully developed but may be reduced in size. Uteri: enlarged.	-	-	-

G.5 - *Stomatopods*

Maturation state	Stages	Reproductive apparatus aspect
IMMATURE	**0**	ovaries filamentous and hyaline; 6^{th}-8^{th} sternites hyaline
QUIESCENT	**1**	filamentous ovaries with evident brown dots (chromatophores), 6^{th}-8^{th} sternites hyaline
EARLY MATURATION	**2**	narrow yellow ovaries, 6^{th}-8^{th} sternites whitish
MATURATION	**3**	yellow ovaries extending up to half of abdomen width, not visible through cutile on the ventral side of telson, 6^{th}-8^{th} sternites white.
RIPE	**4**	yellow ovaries extending over half abdominal width, visible through cutile on the ventral side of telson, 6^{th}-8^{th} sternites milky white.
SPENT	**5**	similar to quiescent ovaries, sometime with fewyellow dots, but 6^{th}-8^{th} sternites still white.

Appendix H - European eel fishery

H.1 - European eel habitats

Habitat	Code
Lagoon	**LGN**
Lake	**LAK**
Managed lagoon*	**MLG**
River	**RIV**

* Coastal lagoons which displays also fixed barriers at the sea channel

H.2 - Gear types for the European eel fishery

Gear types	Code	Gear units
Barrier	**BAR**	Meters*
Eel longlines	**ELL**	Number of hooks
Fishing rod	**FRD**	Number of rods
Glass eel net	**GEN**	Number of nets
Gillnets	**GLN**	Meters
Shore lift net	**SLN**	Number*
Spear fishing	**SPF**	Number*
Traps fyke nets	**FYK**	Number of fyke nets
Umbrella	**UMB**	Number of umbrellas

*if other units are used please indicate

H.3 - Stocking eel life stages

Life stage code	Name	Definition
G	Glass eel	Young, unpigmented eel, recruiting from the sea into continental waters. WGEEL considers that the term “glass eel” includes all recruits of the 0+ cohort age. In some cases, however, it also includes the early pigmented stages.
GY	Glass eel + yellow eel	A combination of glass and yellow eel. For some traps, glass eel and yellow eel were not separated in historical data sets, although glass eel was dominant.
Y	Yellow eel	Life stage resident in continental waters, often defined as a sedentary phase, although migration within and between rivers as well as to and from coastal waters occurs and concerns young pigmented eels (small eels sometimes called “elvers” or “bootlace eels”). In particular, some recruit series far up in the river (e.g. Meuse) or in the Baltic Sea consist of multiple age classes of young yellow eel, typically from 1 to 10+ years of age; they are referred to as “yellow eel recruits”.
QG	Quarantined glass eel	Eel that has been held in water tanks for some days or months between first capture and then release into a natural water basin, and that has been fed and grown during that time.
OG	Ongrown glass eel	Ongrown eel (see above) that has been held in isolation between capture and restocking.

Appendix I - Shared stocks

English common name	Scientific name	Area	Countries*
Dolphin fish	*Coryphaena hippurus*	Western Mediterranean	Italy, Malta, Spain and Tunisia
Horned octopus	*Eledone cirrhosa*	Adriatic Sea	Albania, Croatia, Italy and Serbia-Montenegro
Musky octopus	*Eledone moschata*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Anchovy	*Engraulis encrasicolus*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Anchovy	*Engraulis encrasicolus*	Aegean Sea	Greece and Turkey
Anchovy	*Engraulis encrasicolus*	Gulf of Lion	France and Spain
Shortfin mako	*Isurus oxyrhinchus*	All Mediterranean	All countries
Porbeagle	*Lamna nassus*	All Mediterranean	All countries
European squid	*Loligo vulgaris*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Blackbellied angler	*Lophius budegassa*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Monkfish or angler	*Lophius piscatorius*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Hake	*Merluccius merluccius*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Hake	*Merluccius merluccius*	Gulf of Lion	France and Spain
Hake	*Merluccius merluccius*	North Tyrrhenian and Corsica	France and Italy
Hake	*Merluccius merluccius*	Sicily Channel	Italy, Libya, Malta and Tunisia
Blue whiting	*Micromesistius poutassou*	Adriatic Sea	Albania, Croatia, Italy and Serbia-Montenegro
Blue whiting	*Micromesistius poutassou*	North Tyrrhenian and Corsica	France and Italy
Red mullet	*Mullus barbatus*	Western Mediterranean	Corsica and Sardinia
Red mullet	*Mullus barbatus*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Striped red mullet	*Mullus surmuletus*	Western Mediterranean	Corsica and Sardinia
Norway lobster	*Nephrops norvegicus*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Norway lobster	*Nephrops norvegicus*	North Tyrrhenian and Corsica	France and Italy

English common name	Scientific name	Area	Countries*
Black spot seabream	*Pagellus bogaraveo*	Alboran Sea and the Straits of Gibraltar	Morocco and Spain
Common pandora	*Pagellus erythrinus*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Common spiny lobster	*Palinurus elephas*	Western Mediterranean	Corsica and Sardinia
Common spiny lobster	*Palinurus elephas*	Sicily channel	Italy and Tunisia
Pink spiny lobster	*Palinurus mauritanicus*	Sicily channel	Italy and Tunisia
Deepwater rose shrimp	*Parapenaeus longirostris*	Adriatic Sea	Albania, Croatia, Italy and Serbia-Montenegro
Blue shark	*Prionace glauca*	All Mediterranean	All countries
Sardine	*Sardina pilchardus*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Sardine	*Sardina pilchardus*	Aegean Sea	Greece and Turkey
Atlantic mackerel	*Scomber scomber*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Common cuttlefish	*Sepia officinalis*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Common sole	*Solea vulgaris*	Adriatic Sea	Albania, Croatia, Italy, Slovenia and Serbia-Montenegro
Sprat	*Sprattus sprattus*	Adriatic Sea	Croatia, Italy, Slovenia
Albacore	*Thunnus alalunga*	All Mediterranean	All countries
Bluefin tuna	*Thunnus thynnus*	All Mediterranean	All countries
Swordfish	*Xiphias gladius*	All Mediterranean	All countries

SAC provisional shared stocks list/Liste provisoire des stocks partagés du CSC (GFCM, 2006) (Annex H - Report of the ninth session of the Scientific Advisory Committee on Fisheries, Rome, Italy, 24-27 October 2006).

*Contracting parties in 2006

Appendix L - Geographical subareas (GSA) and GFCM subregions

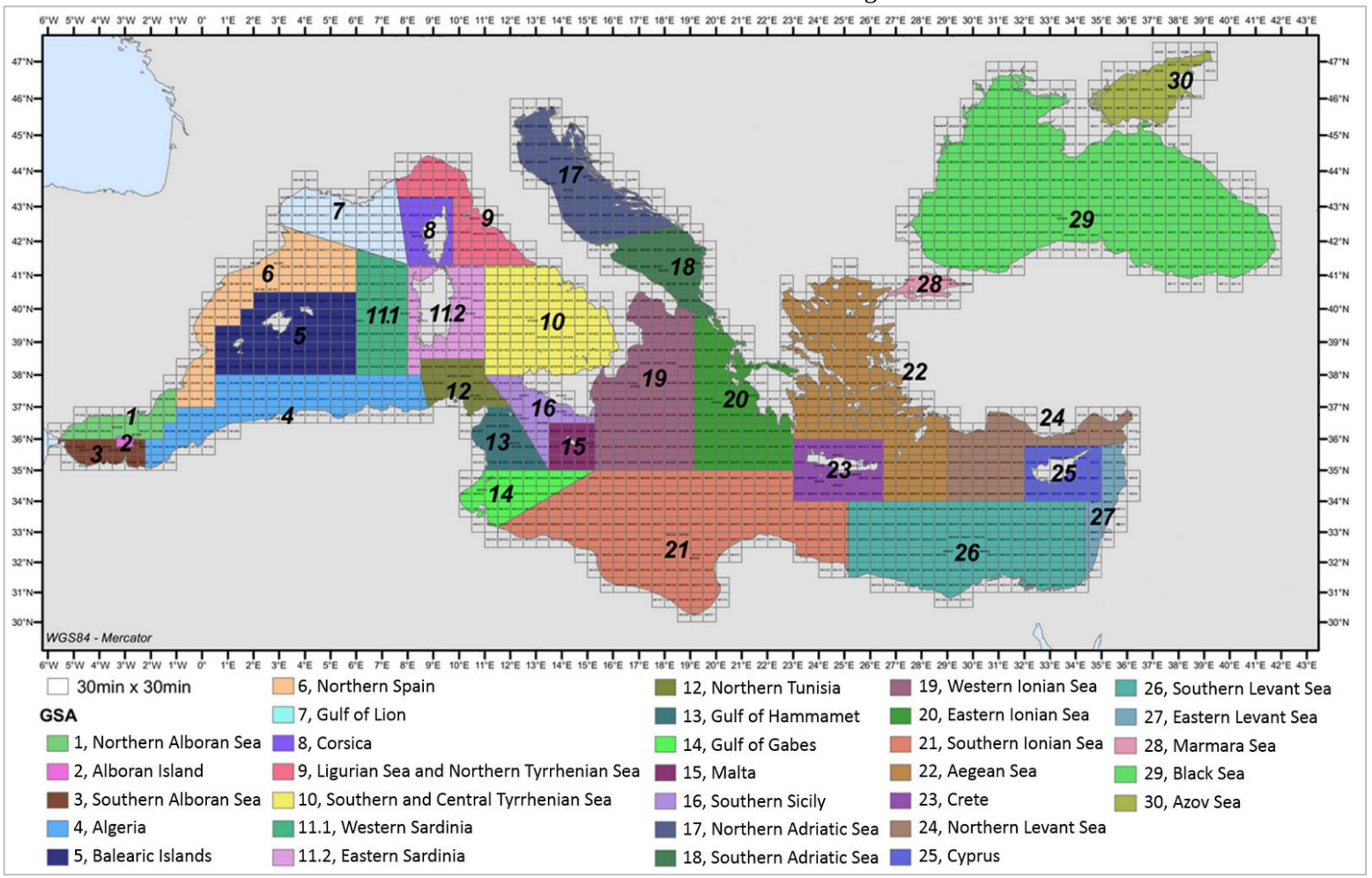
GSA	Name
1	Northern Alboran Sea
2	Alboran Island
3	Southern Alboran Sea
4	Algeria
5	Balearic Islands
6	Northern Spain
7	Gulf of Lion
8	Corsica
9	Ligurian Sea and Northern Tyrrhenian Sea
10	Southern and Central Tyrrhenian Sea
11.1	Western Sardinia
11.2	Eastern Sardinia
12	Northern Tunisia
13	Gulf of Hammamet
14	Gulf of Gabès
15	Malta
16	Southern Sicily
17	Northern Adriatic Sea
18	Southern Adriatic Sea
19	Western Ionian Sea
20	Eastern Ionian Sea
21	Southern Ionian Sea
22	Aegean Sea
23	Crete
24	Northern Levant Sea
25	Cyprus
26	Southern Levant Sea
27	Eastern Levant Sea
28	Marmara Sea
29	Black Sea
30	Azov Sea

GFCM subregions	GSAs	Countries
Western Mediterranean Sea	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Algeria, France, Italy, Morocco, Spain
Central Mediterranean Sea	12, 13, 14, 15, 16, 19, 20, 21	Greece, Italy, Libya, Malta, Tunisia
Adriatic Sea	17, 18	Albania, Bosnia and Herzegovina, Croatia, Italy, Montenegro, Slovenia
Eastern Mediterranean Sea	22, 23, 24, 25, 26, 27	Cyprus, Egypt, Greece, Israel, Lebanon, Syrian Arabic Republic, Turkey
Black Sea	28, 29, 30	Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)*

**All States, including non-CPCs of the GFCM which are known to fish in its competence area, are encouraged to cooperate in joint actions undertaken in accordance with applicable international obligations (i.e. Article 63 UNCLOS).*

Appendix M - Geographic statistical grid for red coral

Mediterranean and Black Sea statistical grid[37]



[37] www.fao.org/gfcm/data/maps/grid

Appendix N - Templates for the selection of fleet segments and species (by GSA)

Template 1) Fleet segments operating in the GSA

GFCM subregion	
GSA	
Country	
Reference year	
1) List of all fleet segments operating in the GSA	**Notes**

Template 2) Fleet segments selected for the collection of biological variables

GFCM subregion		
GSA		
Country		
Reference year		
2) List of fleet segments selected, through the weighting procedure, for the collection of biological variables	**Discards* (Y/N)**	**Notes**

** discards information should be collected only when the discard rate exceeds 10 percent of the total volume of catches for a given fleet segment in a given GSA.*

Template 3) Species for which data collection will be carried out

GFCM subregion		
GSA		
Country		
Reference year		
Group 1 species**	**Data to be collected (Y/N)**	**Notes**
Group 2 species**	**Data to be collected (Y/N)**	**Notes**
Group 3 species**	**Data to be collected (Y/N)**	**Notes**

***exemption rules are applicable if the weight of the species accounts for less than 2% of total landings of the country (regardless of the GSAs)*

Appendix O - Data transmission calendar

DCRF Tasks and Subtasks			Reference year	Frequency (Annual or Biennial)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
I	***Global figures of national fisheries***		n-1	A					X							
II	***Catch***	II.1 / Landing data	n-1	A						X						
		II.2 / Catch data per species	n-1	A						X						
		II.3.1 / Fishing activities - Alboran Sea (blackspot seabream)	n-1	A											X	
		II.3.2 / Fishing activities - Black Sea (turbot)	n-1	A	X											
		II.3.3 / Fishing activities - Ionian Sea (shrimps)	n-1	A	X											
		II.3.4 / Fishing activities - Levant Sea (shrimps)	n-1	A	X											
		II.3.5 / Fishing activities - Strait of Sicily (demersal)	n-1	A								X				
		II.4.1 / Landing points - Adriatic Sea (demersal stocks)	n	A											X	
		II.4.2 / Landing points - Black Sea (turbot)	n	A											X	
		II.4.3 / Landing points - Ionian Sea (shrimps)	n	A											X	
		II.4.4 / Landing points - Jabuka Pomo Pit	n	A				X								
		II.4.5 / Landing points - Levant Sea (shrimps)	n	A											X	
		II.4.6 / Designated ports (Red coral)	n	A						X						
		II.4.7 / Landing points - Strait of Sicily (demersal stocks)	n	A											X	
		II.4.8 / Designated ports - Alboran Sea (blackspot seabream)	n	A		X										
III	***Incidental catch of vulnerable species***		n-1	A							X					
IV	***Fishing fleet***	IV.1 / Fishing vessels - LOA≤15 m	n-1, n	A					X							
		IV.2 / Fishing vessels - LOA>15 m	n-1, n	A					X							
		IV.3 / Fishing vessels - Fishery Restricted Areas (FRA)	n-1, n	A					X							
		IV.4.1 / Authorized vessels - Adriatic Sea (demersal)	n	A	X											
		IV.4.2 / Authorized vessels - Adriatic Sea (small pelagics)	n	A											X	
		IV.4.3 / Authorized vessels - Alboran Sea (blackspot seabream)	n	A		X										
		IV.4.4 / Fishing vessels - Black Sea (turbot)	n	A	X											
		IV.4.5 / Authorized vessels - Common dolphin fish fisheries	n	A							X					
		IV.4.6 / Fishing vessels - Ionian Sea (shrimps)	n	A	X											

DCRF Tasks and Subtasks			Reference year	Frequency (Annual or Biennial)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
IV	***Fishing fleet***	IV.4.7 / Fishing vessels - Levant Sea (shrimps)	n	A	X											
		IV.4.8 / Authorized vessels and fishers - Red coral	n	A						X						
		IV.4.9 / Fishing vessels - Strait of Sicily (demersal stocks)	n	A											X	
		IV.4.10 / Fishing vessels - Strait of Sicily (shrimps)	n	A						X						
		IV.4.11 - Authorized vessels - European eel	n	A						X						
V	***Fishing effort***	V.1 / Fishing effort - Fleet segment	n-1	A						X						
		V.2 / Fishing effort - Fishing gear	n-1	A						X						
		V.3 / Fishing effort - CPUE	n-1	A						X						
VI	***Socio-economics***	VI.1 / Economic and social data	n-1	A											X	
		VI.2 / Operating costs	n-2*	A / B*					X*							
		VI.3 / Species value	n-2*	A / B*					X*							
		VI.4 / Other economic aspects	n-2*	A / B*					X*							
VII	***Biological information***	VII.1 / Stock Assessment input data**	n-1	A											X	
		VII.2 / Length data	n-1	A							X					
		VII.3.1 / Size at first maturity	n-1	A							X					
		VII.3.2 / Maturity data	n-1	A							X					
		VII.4.1 / Dolphin fish (general information)	n-1	A							X					
		VII.4.2 / Dolphin fish (statistics)	n-1	A							X					
		VII.5 / Red coral	n-1	A						X						
		VII.6 / European eel	n-1	A									X			

*Data reference year is "n-2", on an annual or biennial basis.
Biennial transmission should only take place for those countries that do not have annual economic surveys in place. Countries collecting these data on a yearly basis are requested to transmit them annually (keeping reference year - 2).
**The date of data transmission will be linked to the scheduling of the GFCM stock assessment working groups and therefore may differ from year to year.

Notes - *At the beginning of each sampling year, each country should transmit three templates containing: all the fleet segments (based on Appendix B and/or the fleet segments resulting from merging process, if any) operating in each GSA with indication of those fleet segments that, based on the weighting procedure, have been identified for the collection of biological variables, as well as all the species (G1, G2 and G3) for which the biological data collection will be carried out (sections 6.2 and 6.3 - Appendix N).*

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