Working Group on the Black Sea (WGBS)
Ninth meeting
Online, 28–30 July 2021
Report

EXECUTIVE SUMMARY

The ninth meeting of the Working Group of the Black Sea (WGBS) took place online from 28 to 30 July 2021. The meeting reviewed the work carried out during the 2019–2021 intersession in relation to stock assessment, management of selected fisheries, data collection, small-scale fisheries as well as work on the interactions between fisheries and the ecosystem. It also discussed activities within the framework of the BlackSea4Fish project.

The WGBS formulated advice on: i) the implementation of the BlackSea4Fish project, ii) data collection and quality indicators, iii) the implementation of the Regional plan of action for small-scale fisheries, iv) the future approach for the provision of advice, v) the status of Black Sea stocks, with all main commercial stocks assessed being in overexploitation, uncertain, depleted or fluctuating around MSY; and vi) the management of priority species. Finally, the WGBS agreed upon its work plan for 2021–2023 in support of mid-term strategy activities that would be coordinated, among others, through the BlackSea4Fish project. The WGBS reconfirmed the existing bureau.

OPENING, ARRANGEMENTS OF THE MEETING AND ADOPTION OF THE AGENDA

1.   The ninth meeting of the Working Group on the Black Sea (WGBS) of the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) was held online from 28 to 30 July 2021. The meeting was attended by delegates from six Black Sea countries and the European Union, eight observers as well as representatives of the GFCM Secretariat and invited experts. The list of participants is provided in Appendix 2. The session was chaired by Mr Galin Nikolov, WGBS Coordinator. The adopted agenda is attached in Appendix 1 and the list of documents is reproduced in Appendix 3. On the basis of the discussions held, the WGBS formulated the conclusions reported hereafter.

OVERVIEW OF INTERSESSIONAL ACTIVITIES OF RELEVANCE TO THE WGBS

2.   The Working Group commended the impressive work carried out during the intersession, especially in the context of the BlackSea4Fish project, despite important limitations and difficulties linked to the COVID-19 pandemic. Experts and stakeholders were praised for their contributions in formulating improved integrated advice on Black Sea fisheries, including the encouraging progress achieved with the research programme for rapa whelk (*Rapana venosa*).

3.   The Working Group underlined that the maturity reached by the BlackSea4Fish project and the crucial support provided by the GFCM Technical Unit for the Black Sea (GFCM-BSU) had set an important precedent in the implementation of the GFCM subregional approach: they had proven to be a dynamic and transparent platform facilitating advances on key management issues through targeted

capacity development, promoted synergies and productive knowledge-sharing practices. BlackSea4Fish was referred to as a flagship project that could lead regional technical contributions towards sustainability objectives. The combination of the project and the GFCM-BSU was considered to be a perfect example of effective subregional coordination and support to decision-making, particularly fitting in view of the implementation of the GFCM 2030 Strategy for sustainable fisheries and aquaculture in the Mediterranean and the Black Sea, and would ideally be replicated in other subregions of the GFCM area of application.

ISSUES RELATED TO FISHERIES DATA COLLECTION, DATA QUALITY AND THE PROVISION OF ADVICE

Data quality

4.   The Working Group appreciated the progress made on data quality assessment and expressed its importance and usefulness in identifying gaps in fisheries data. In comparison with the data submitted by contracting parties and cooperating non-contracting parties (CPCs) on Mediterranean fisheries and the analysis presented to the twenty-second session of the GFCM Scientific Advisory Committee on Fisheries (SAC), Black Sea data submissions show better performance in terms of timeliness, conformity and stability, while they show slightly worse performance in terms of consistency.

5.   The Working Group highlighted the need to continue working on the implementation of quality indicators to all fisheries data transmitted through the Data Collection Reference Framework (DCRF) online platform and to address shortcomings in the data as identified by this analysis, towards ensuring the best quality of information in support of decision making.

Framework for the provision of advice

6.   The Working Group praised the significant improvements made in the provision of advice in the Black Sea in recent years, highlighting the importance of focusing on enhancing the quality of underlying data and establishing a streamlined process that would also promote transparency and reproducibility. The Working Group endorsed the proposed terms of reference for the revision of the GFCM framework for the provision of advice (Appendix 10) and agreed to start from the compilation of assessment methods used in the context of the GFCM, making use of the proposed template.

ADVANCES ON RESEARCH PROGRAMMES, RECREATIONAL FISHERIES AND THE IMPLEMENTATION OF THE REGIONAL PLAN OF ACTION FOR SMALL-SCALE FISHERIES IN THE MEDITERRANEAN AND THE BLACK SEA

Recreational fisheries

7.   The Working Group praised the efforts made to enhance knowledge on recreational fisheries, noting that this topic would become an important issue for the future management of resources in the region, including in the context of the new GFCM 2030 Strategy. Noting that a common toolbox would be needed to support recreational fisheries management in the future, the Working Group agreed that an important first step would be to identify and better understand the subregional specificities of recreational fisheries, particularly their impacts on key species. To this end, it endorsed the proposed list of species to guide the collection and analysis of recreational fisheries data (Appendix 7).

Monitoring of implementation of the Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea

8.   The Working Group noted the priority action of the Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea (RPOA-SSF) to address interactions between small-scale and recreational fisheries and supported the need to identify and gather further information on those species targeted by both sectors, in view of improving advice to address these interactions.

Research programme on rapa whelk

9.   The Working Group applauded the work carried out within the context of the regional research programme on rapa whelk fisheries in the Black Sea, especially commending the important effort of all CPCs and the BlackSea4Fish project in the organization and implementation of the first two standardized scientific beam trawl surveys covering all of the Black Sea. It further welcomed the exceptional amount of information gathered on all aspects of importance, from the biology and ecology of the species to fishery-dependent data, socioeconomics and governance. Collectively, this work contributed to a significant improvement in advice, revealing a stock in possible overexploitation whose fishing mortality should not increase (Appendix 4). Nonetheless, the Working Group noted that there was a need to complement the information at hand at a basin scale and encouraged the collation and collection of data from all riparian countries, with particular emphasis placed on performing a basin-wide socioeconomic analysis.

10.   The Working Group reiterated the importance of addressing this non-indigenous species in the Black Sea through fisheries management principles rather than aiming at eradicating it, which is considered unfeasible. In this context it agreed on and proposed a roadmap towards the drafting of technical elements for the management of rapa whelk fisheries in the Black Sea (Appendix 11). It was also highlighted that the structure of this roadmap could be applicable to other examples in the GFCM area of application, such as towards the management of blue crabs.

FORMULATION OF ADVICE ON MARINE LIVING RESOURCES AND FISHERIES MANAGEMENT

Overview of the status of fisheries

11.   The Working Group welcomed the comprehensive report provided by The State of Mediterranean and Black Sea Fisheries (SoMFi) 2020, noting that this report had become an indispensable tool to support management and provide an overview of the trends and status of fisheries in the region. Furthermore, considering the significant impact of the COVID-19 pandemic on the region's fishing sector, the Working Group particularly applauded the summary of assessments of the pandemic on the fisheries sector, included in SoMFi 2020. The Working Group underlined that an updated assessment of COVID-19 impacts, considering the continued effects of the pandemic into 2021, would be useful.

12.   The Working Group recalled the importance of integrating information stemming from the national reports to WGBS into a regional overview of key fisheries issues. It noted that only two national reports were received ahead of the meeting, limiting the amount of information available to contribute to such overview. However, it welcomed the presentation on the status and trends of fleet, capture fisheries production, socio-economic impacts, bycatch and state of resources, as emanating from other official submissions such as the DCRF, stock assessment forms or national reports to the Compliance Committee (CoC). Informed of the discussion that took place at the twenty-second session of the SAC, which acknowledged the importance of the national reports but recognized that their structure might be obsolete in light of current needs, the Working Group agreed to support the SAC Bureau in the planned consultations aiming to submit to the Commission, at its next session, a proposal to adapt the use of national reports and streamline the different sources of information towards ensuring accurate scientific and strategic overviews of the fisheries sector that are useful for decision making.

13.   The Working Group acknowledged that, of the eight Black Sea priority stocks assessed in 2021, European sprat (*Sprattus sprattus*) was sustainably exploited, Black Sea anchovy (*Engraulis encrasicolus ponticus*) was uncertain, piked dogfish (*Squalus acanthias*) was depleted and all others, namely turbot (*Scopthalmus maximus*), horse mackerel (*Trachurus mediterraneus*), red mullet (*Mullus barbatus*), whiting (*Merlangius merlangus*) and rapa whelk were considered to be outside safe biological limits. Of these, qualitative precautionary advice was given for horse mackerel, piked dogfish, whiting and rapa whelk, as the assessments were considered indicative of trends; more comprehensive quantitative advice was provided for red mullet and European sprat. The advice for

turbot was updated based on the decisions taken in the 2019 benchmark, providing semi-quantitative advice, pending re-estimation of reference points. A summary of the status and advice by stock is available in Appendix 4. In addition, the Working Group endorsed the proposed roadmaps for the finalization of the benchmark assessments of Black Sea anchovy and European sprat and the improvement of horse mackerel data (Appendix 11).

14.   The Working Group underlined the important improvement in both the capabilities of the experts and the input data, noting that together they had resulted in better assessments and more accurate advice. It encouraged the Subregional Group on Stock Assessment in the Black Sea (SGSABS) to keep working towards the provision of sound quantitative advice for all priority species, underlining the importance of data preparation meetings, for which it endorsed detailed terms of reference (Appendix 10). In this context, the Working Group also commended the provision of advice based on year n-1 data thus successfully shortening the gap between data and advice, and endorsed the proposal of holding the SGSABS in July every year to consistently provide advice based on year n-1 data.

15.   The Working Group underlined the importance of further strengthening the capabilities of Black Sea experts in data analysis and assessment-related issues encouraging the organization of further training activities for Black Sea experts, under the framework of the BlackSea4Fish project.

16.   The Working Group reviewed, praised and endorsed the Stock Assessment Results framework (STAR), a new framework for the organization of GFCM stock assessment results, which enabled the streamlining and automation of information flows from stock assessments to scientific advice, thus strengthening data quality and dissemination and promoting transparency.

17.   The Working Group endorsed the proposed plan for future benchmark assessments summarized in Appendix 9.

Management of Black Sea fisheries

Session on Black Sea turbot

18.   The Working Group welcomed the continuing positive evolution of the Black Sea turbot stock, which, despite still being in overexploitation, was experiencing a further decrease in fishing mortality and estimated spawning biomass levels above the range of reference points considered in previous assessments (Appendix 4). In recalling the request of the forty-third session of the GFCM to estimate new reference points before finalizing the ongoing benchmark session and in light of the requirements of Recommendation GFCM/43/2019/3 amending Recommendation GFCM/41/2017/4 on a multiannual management plan for turbot fisheries in the Black Sea (geographical subarea 29), the Working Group endorsed a roadmap towards the estimation of new reference points by July 2022 according to a stepwise process (Appendix 11).

19.   In reflecting on future management options for Black Sea turbot, the Working Group identified a need to review the available information on the spawning period of turbot in all riparian countries, which in Bulgaria and Romania had been observed to happen earlier in the year with possible implications on the closure period. The Working Group proposed a roadmap to further investigate this issue in view of possibly identifying improved alternative closure periods, also taking into consideration all available information (Appendix 11).

20.   The Working Group acknowledged the fact that there was an underage in the total allowable catch (TAC) of European Union member states in 2020 owing to the COVID-19 pandemic. Taking into account the requirements of Recommendation GFCM/43/2019/3 and in light of both the positive evolution of the turbot stock and the exceptional socioeconomic circumstances generated by the pandemic, the Working Group endorsed the request of the European Union to carry-over 18 tonnes of 2020 TAC underage into 2021.

Session on piked dogfish

21.   Despite the scarcity of information available on the species, the Working Group highlighted that the stock of piked dogfish was considered to continue being depleted and reiterated that action was needed to revert that situation (Appendix 4).

22.   In order to adopt adequate management measures to revert the critical state of the piked dogfish population in the Black Sea and in light of the current knowledge gaps, the Working Group proposed to proceed according to a two-step process foreseeing i) the initial implementation of transitional precautionary management measures accompanied by a research programme to improve available information, followed by ii) the identification of adaptive measures within a full-fledged multiannual management plan with well-defined targets and goals (i.e. stock recovery) upon availability of more data. To this end, the Working Group provided proposed technical elements for the management of piked dogfish in the Black Sea (Appendix 5).

Issues related to the minimum conservation reference size of select species

23.   The Working Group acknowledged the fact that red mullet in the Black Sea was considered to be in overexploitation with a number of issues associated with available data. In light of this, it proposed the formulation of a roadmap towards achieving conservation and sustainability goals. Such roadmap should foresee a stepwise approach to management including i) the identification of a package of control and conservation measures with the possibility of a minimum conservation reference size applicable to the entire Black Sea, and ii) the formulation of a plan to address data deficiencies (e.g. the need to establish dedicated surveys-at-sea as well as a harmonized genetic study to solve misidentification issues in catches and understand illegal, unreported and unregulated [IUU] fishing intricacies). The Working Group recommended this roadmap be defined and implemented with the support of SGSABS/red mullet scientists and experts.

Additional advice, including on the interactions between fisheries and marine ecosystems and environment

Bycatch and selectivity

24.   The Working Group enthusiastically welcomed the results emerging from the discards monitoring programmes carried out in Turkey and Ukraine and recognized the significant efforts made to produce them in line with the standard FAO-GFCM methodologies[1] already applied in other areas of the Mediterranean and the Black Sea. The Working Group expressed particular satisfaction with the information collected on discards as well as on vulnerable species and marine litter. The importance of continuing these activities into the future was stressed, while underlining the importance of improving the sampling strategy taking due consideration of identified weaknesses and limitations. In this light, the WGBS expressed its hope that these monitoring programmes could represent a turning point towards producing a regular time series to support stock assessments and the formulation of advice.

25.   With respect to the outcomes of the project on Cetacean bycatch mitigation in the Black Sea (CeNoBS project), the Working Group expressed its appreciation for the work done by the project noting it significantly contributed to increasing the knowledge on the incidental catch of cetaceans in the region. Considering the specific issue of cetacean bycatch from the turbot fishery, the Working Group underlined the need to work on a significant reduction of these incidental catches and test solutions (i.e. mitigation measures) while still supporting the livelihoods of those depending on the fishery, also taking advantage of, and in coordination with, the work done by the Agreement on the

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[1] FAO. 2019. *Monitoring discards in Mediterranean and Black Sea fisheries: methodology for data collection.* FAO Fisheries and Aquaculture Technical Paper No. 639. Rome

Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) in the region.

26.   The WGBS reviewed and endorsed the draft concept note for a pilot project to assess cetacean bycatch in Black Sea turbot fisheries and to test measures to mitigate the incidental catch of cetaceans proposed by the Working Group on Fishing Technology (WGFiT) (Appendix 6).

27.   The Working Group reviewed the proposal of the WGFiT suggesting a minimum length of 2 m and mandatory 40 mm square mesh size for the codend of bottom trawlers, as well as a mesh size greater than 50 mm for diamond-mesh or greater than 40 mm for square-mesh for the rest of the trawl net. While recognizing that increasing gear selectivity was key to reducing fishing mortality, in particular for juvenile fish and unwanted catches (e.g. discards and accidental catches of vulnerable species), and in line with the discussion on this issue that took place at the twenty-second session of the SAC, the Working Group considered the endorsement of the proposed minimum technical specifications premature. The Working Group noted that the proposal would benefit from further inputs, in particular regarding a deeper evaluation of the socio-economic implications and impacts (e.g. a cost–benefit analysis) of changing mesh size. This should be performed under the framework of the WGFiT, concentrating on i) a review of the gear involved and the species affected, while also taking advantage of the catalogue of fishing gear ii) an analysis of the numerous technical studies on gear selectivity carried out to date in the Black Sea countries and iii) the initiation of an analysis of socioeconomic impacts and implications.

Sturgeon

28.   The Working Group welcomed with great interest the important contributions provided on the conservation, exploitation and investigation of sturgeon (Acipenseridae family) populations in the Black Sea area, noting the extremely critical situation of these diadromous species whose management was significantly complicated by its peculiar life cycle. The Working Group expressed its willingness to address the more critical issues related to the marine part of the sturgeon life-cycle through the implementation of a pilot project to be conducted under the framework of the BlackSea4Fish project in collaboration with all relevant partners, according to the general terms of reference provided in Appendix 10.

Spatial management

29.   The Working Group acknowledged the importance of the work being done on vulnerable marine ecosystems (VME) and endorsed the proposed data call scheme for VME-related data (Appendix 8) aimed at populating the GFCM Database on Sensitive Benthic Habitats and Species, highlighting the importance of enriching the current dataset on a regular basis towards the provision of scientific advice on the distribution of vulnerable benthic habitats and species.

30.   The Working Group welcomed and commended the GFCM database on national fisheries restricted areas underlining its usefulness in displaying closure areas in national waters that could contribute to improving the exploitation and conservation of fish stocks as well as the protection of the coastal marine ecosystem. The Working Group encouraged the contribution of Black Sea riparian countries to the database by sharing all relevant information on existing spatial restrictions to fisheries within national waters. The Working Group considered this an important step towards initiating the discussion on spatial management in the Black Sea and in this context proposed a Black Sea session be organized at the Working Group on Vulnerable Marine Ecosystems and Essential Fish Habitats (WGVME-EFH) in 2022.

Possible future proposals for fisheries management

31.   The Working Group was informed by the delegate of the European Union of their ongoing work towards a series of proposals for GFCM decisions addressing priorities in line with the advice of the WGBS planned to be submitted to the Commission at its next annual session. The proposals

addressed, namely, the establishment of management measures for piked dogfish and European sprat, a catch certificate scheme for turbot as well as a framework for improving the conservation of sturgeons.

WORK PLAN FOR 2021–2023

Stock assessment and strengthened advice

- Continue to investigate the stock identification for the main commercial species, especially for red mullet, horse mackerel and piked dogfish.

- Compile relevant information on priority species towards improving the quality of data, to be appraised within data preparation meetings (terms of reference in Appendix 10).

- Finalize the roll-out of the creation of the Black Sea subregional scientific database.

- Execute the plan of action, as a step-by-step approach, for the improvement of input data and the assessment of piked dogfish.

- Conduct an awareness campaign on dogfish for fishers in 2022.

- Draft a roadmap for the improvement of input data and the identification of potential management measures for red mullet.

- Execute the roadmap, as a step-by-step approach, for the determination of technical elements for the management of rapa whelk fisheries in the Black Sea.

- Execute the roadmap for the finalization of benchmark assessments of Black Sea anchovy and European sprat (Appendix 11).

- Execute the roadmap for the improvement of input data for the assessment of horse mackerel in the Black Sea (Appendix 11).

- Execute the roadmap for advancing on the management of Black Sea turbot (Appendix 11).

- Improve the estimation of bycatch of priority species, including estimates of discards and discards by age/length of red mullet, whiting and horse mackerel.

- Ensure the implementation of surveys-at-sea that provide fishery-independent indexes of abundance for the main commercial species over their whole geographic range, in particular for turbot, piked dogfish and red mullet.

- Finalize the benchmark assessments for anchovy, sprat and turbot in the 2021/2022 intersession and organize benchmarks sessions for horse mackerel in 2022/2023 and whiting in 2023/2024 (Appendix 9).

- Continue the development of the STAR framework.

- Revise the framework for the provision of advice (terms of reference in Appendix 10).

- Continue compiling socio-economic fisheries data, including on small-scale fisheries.

- Conduct training activities to increase the capacity in data analysis, stock assessment and/or quantitative assessments of management scenarios.

Data collection and quality indicators

- Continue working on the implementation of quality indicators for all the fisheries data transmitted through the DCRF online platform, including those which have been recently included in the platform in line with the DCRF harmonization process.

- Keep the DCRF manual up-to-date and conclude the release of data transmission tools on the DCRF online platform for those reporting requirements which have been harmonized with the DCRF and are not yet included in the platform.

- Carry out a technical consultation with national experts for an effective transmission of fisheries data to the GFCM via the DCRF online platform and for the consolidation of data quality assessment through the identification of priorities for streamlined summary outputs.

Sustainable small-scale and recreational fisheries, including priority actions for the implementation of the RPOA-SSF

- Finalize the ongoing pilot studies on recreational fisheries data collection in Turkey (Black Sea coast) and report on the results.

- Provide technical assistance to additional countries interested in setting up recreational fisheries data collection, in line with the *Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea*.

- Compile available information on the list of species relevant to recreational fisheries, in line with the identified criteria, in order to provide a preliminary appraisal of the impacts of recreational fisheries on these species and to guide future work of the Working Group on Recreational Fisheries (WGRF).

- Strengthen the network of recreational fishing associations, federations and other stakeholder groups in view of facilitating their engagement in the work of the WGRF and supporting bottom-up initiatives.

- Continue supporting the implementation of RPOA-SSF priority actions, including the SSF Forum capacity building programme and the testing of the matrix for the characterization of fisheries.

Interactions between fisheries and the marine environment and ecosystems

Bycatch and fishing technology issues

- Continue implementing, with relevant partners, the bycatch monitoring programme and related tests of mitigation measures.

- Implement the pilot project to assess cetacean bycatch in Black Sea turbot fisheries and to test measures to mitigate the incidental catch of cetaceans (Appendix 6).

- Compile and analyse available information stemming from existing technical studies on gear selectivity, in view of consolidating advice on minimal technical specifications to be implemented in bottom trawl nets and informing future work to assess the socio-economic impacts (e.g. cost-benefit analysis) of implementing such minimal technical specifications.

- Prepare a regional repository of measures to share experiences on the mitigation of adverse impacts of fisheries on juvenile fish, discards and the incidental catch of vulnerable species (i.e. marine mammals, seabirds, sharks and rays).

- Establish a working process and committee to review and award best practices in the application of selectivity measures.

- Provide guidance on the standardized marking of fishing gear at the regional level, based on the FAO Voluntary Guidelines on the Marking of Fishing Gear and other related documents.

- Expand the testing of fishing gear tagging with electronic sensors, in the context of a pilot project, to other interested countries, relevant fisheries and applicable scenarios.

- Finalize and publish the catalogue on fishing gear in the Mediterranean and the Black Sea.

- Implement the GFCM pilot project on marine litter and explore expanding the project, in subsequent phases, to other relevant areas in the region.

- Explore opportunities to provide technical assistance to countries that have not, to date, advanced work on selectivity in their national fisheries.

Spatial management measures

- Advance with the adoption of a formal data call to stakeholders to obtain data to feed the GFCM Database on Sensitive Benthic Habitats.

- Organize a session specific to the Black Sea within the WGVME-EFH in 2022 and start addressing the protection of priority EFH and/or areas hosting VMEs in the Black Sea.

- Submit data on FRAs existing at the national level for the GFCM Secretariat to include in the GFCM database on national fisheries restricted areas.

Sturgeon

- Implement a pilot project on sturgeon (terms of reference in Appendix 10).

Advances towards an adaptation strategy for climate change

- Advance on the work towards providing technical advice on the impact of climate change on fisheries and towards devising an adaptation strategy for climate change, according to the methodology endorsed at the seventh session of the WGBS.

Meetings

Meeting
WGRF
WGSSF
WGFiT
WGVME-EFH
SGSABS
Tenth meeting of the WGBS
Technical consultation on bycatch

In addition to the above, all stock assessment sessions, including benchmarks, should be preceded by a data preparation meeting, expected to be managed by the BlackSea4Fish project.

ELECTION OF THE BUREAU

32.   The GFCM Executive Secretary referred to Articles 7 and 8 of the GFCM Rules of Procedures related to the election and functions of the Bureau and reminded that the current Bureau – composed of Mr Galin Nikolov (Bulgaria) as WGBS coordinator, Mr Ilhan Aydin (Turkey) and Mr George Tiganov (Romania) as first and second vice-coordinators, respectively – had been elected in 2019 for a two-year mandate. Considering the crucial work carried out by the Bureau in accompanying the WGBS during a period of growth with the reinforcement of the BlackSea4Fish project and the establishment of the subregional technical unit, despite beginning their mandate under exceptional circumstances such as those linked to the COVID-19 pandemic, the Working Group, in repeatedly praising the Bureau members, unanimously renewed the WGBS Bureau and agreed to submit the proposal to the Commission for endorsement.

ANY OTHER MATTER

33.   Owing to the uncertain evolution of the COVID-19 pandemic, the Working Group deferred the discussion on the venue of the next WGBS to the Commission. It noted that for the advice on Black Sea fisheries to be conducive to sound decision-making, the Subregional Group on Stock Assessment for the Black Sea (SGSABS) should be held in June/July each year in order to work on year n-1 data. The WGBS should then be held at least two to three weeks later, in order to be able to analyse the results emanating from the SGSABS, and also held with enough time before the annual session of the Commission to allow for the elaboration of proposals for recommendations on the basis of the advice formulated.

Agenda

1. Opening, arrangements of the meeting and adoption of the agenda

2. Overview of intersessional activities of relevance to the WGBS, including within the framework of the mid-term strategy and in the context of the BlackSea4Fish project

3. Issues related to fisheries data collection, data quality and the provision of advice

4. Advances on research programmes, recreational fisheries and the implementation of the Regional plan of action for small-scale fisheries in the Mediterranean and the Black Sea

5. Formulation of advice on marine living resources and fisheries management

6. WGBS work plan for 2021–2023

7. Election of the Bureau

8. Any other matter

9. Date and place of the tenth meeting of the WGBS

10. Adoption of conclusions and recommendations

List of participants

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MORENO DE LA CRUZ Elisa

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GEORGIEVA Yoana

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List of documents

GFCM:WGBS9/2021/1	Provisional agenda and timetable
GFCM:WGBS9/2021/2	Executive report of WGBS intersessional activities, recommendations and work plan
GFCM:WGBS9/2021/3	Draft terms of reference for a revised framework for the provision of advice (available in English only)
GFCM:WGBS9/2021/4	Draft concept note for a pilot project to assess cetacean bycatch in Black Sea turbot fisheries and to test measures to mitigate the incidental catch of cetaceans
GFCM:WGBS9/2021/5	Summary information on the minimum conservation reference size of red mullet (*Mullus barbatus*)
GFCM:WGBS9/2021/Inf.1	List of documents
GFCM:WGBS9/2021/Inf.2	List of participants
GFCM:WGBS9/2021/Inf.3	Report of the forty-third session of the General Fisheries Commission for the Mediterranean (Greece, 4–8 November 2019)
GFCM:WGBS9/2021/Inf.4	Report of the eighth meeting of the Working Group on the Black Sea (WGBS) (Turkey, 16–20 September 2019)
GFCM:WGBS9/2021/Inf.5	National reports to the WGBS
GFCM:WGBS9/2021/Inf.6	Activities and achievements of the BlackSea4Fish project (2019-2021)
GFCM:WGBS9/2021/Inf.7	Conclusions and recommendations of the Subregional Group on Stock Assessment for the Black Sea (SGSABS) (Online, 12–16 July 2021)
GFCM:WGBS9/2021/Inf.8	Conclusions and recommendations of the benchmark assessment of Black Sea anchovy in GSA 29 (Online, 5–9 July 2021)
GFCM:WGBS9/2021/Inf.9	Report of the Working Group on Fishing Technology (WGFiT) (online, 8–9 April 2021)
GFCM/WGBS9/2021/Inf.10	Report of the Working Group on Recreational Fisheries (WGRF) (online, 25-26 February 2021)
GFCM:WGBS9/2021/Inf.11	Report of the Expert meeting on Stock Assessment Methodology of the Permanent Working Group on Stock Assessment Methodologies (PWGM) (online, 3–4 February 2021)
GFCM:WGBS9/2021/Inf.12	Updated methodology for the assessment of the vulnerability of fisheries to climate change
GFCM:WGBS9/2021/Inf.13	Results of the application of fisheries data quality indicators on the DCRF online platform
GFCM:WGBS9/2021/Dma.1	FAO. 2020. *The State of Mediterranean and Black Sea Fisheries 2020.* General Fisheries Commission for the Mediterranean. Rome
GFCM:WGBS9/2021/Dma.2	FAO. 2020. *The State of Mediterranean and Black Sea Fisheries 2020 – At a glance.* General Fisheries Commission for the Mediterranean. Rome
GFCM:WGBS9/2021/Dma.3	Manual of the GFCM Data Collection Reference Framework (DCRF) – 2018, version 21.1

GFCM:WGBS9/2021/Dma.4	Sacchi J. 2021. *Overview of mitigation measures to reduce the incidental catch of vulnerable species in fisheries*. GFCM Studies and Reviews No. 100. Rome, FAO
GFCM:WGBS9/2021/Dma.5	Carpentieri, P., Nastasi, A., Sessa, M. & Srour, A., eds. 2021. *Incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: a review*. GFCM Studies and Reviews No. 101. Rome, FAO
GFCM:WGBS9/2021/Dma.6	Carpentieri, P., Bonanno, A. and Scarcella, G. 2020. *Technical guidelines for scientific surveys in the Mediterranean and the Black Sea*. FAO Fisheries and Aquaculture Technical Papers No. 641. Rome, FAO.
GFCM:WGBS9/2021/Dma.7	Birdlife, FAO, ACCOBAMS, SPA/RAC, IUCN and MEDASSET. 2021. *Brief – Collecting data on the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries*. Cambridge, United Kingdom of England and Northern Ireland
GFCM:WGBS9/2021/Dma.8	Grati, F., Carlson, A., Carpentieri, P. & Cerri, J. 2021. *Handbook for data collection on recreational fisheries in the Mediterranean and the Black Sea*. FAO Fisheries and Aquaculture Technical Paper No 669. Rome, FAO
GFCM:WGBS9/2021/Dma.9	Ozturk, B. 2021. *Non-indigenous species in the Mediterranean and the Black Sea*. Studies and Reviews n. 87. General Fisheries Commission for the Mediterranean. Rome.
GFCM:WGBS9/2021/Dma.10	GFCM. 2020. *Fisheries and aquaculture in the Mediterranean and the Black Sea: A preliminary analysis of the impacts of the COVID-19 crisis*. Rome, FAO
GFCM:WGBS9/2021/Dma.11	GFCM. 2020. *Fisheries and aquaculture in the Mediterranean and the Black Sea: An updated analysis of the impacts of the COVID-19 crisis*. Rome, FAO

Status of Black Sea stocks

GSA	Species	Methods	Time series of catches used in the final model	$F_{current}$ *$E_{current}$	F_{unique} *E=0.4	F/F_{unique} *E/E=0.4	$B_{current}$	B_{MSY} *B_{pa} **B_{lim}	B/B_{MSY} *B/B_{pa} **B/B_{lim}	Stock status	Scientific advice	Comments (SGSABS/WGBS)
29	Black Sea anchovy (*Engraulis encrasicolus ponticus*)	SAM XSA	1988–2020	-	-	-	-	-	-	Uncertain	Do not increase fishing mortality	Benchmark not concluded. Contrasting signals in the data did not allow the status of the stock to be ascertained. A roadmap for the finalization of the benchmark was suggested.
29	Turbot (*Scophthalmus maximus*)	SAM	1950–2020	0.28			6 397 tonnes			In overexploitation, biomass above the range of reference points	Reduce fishing mortality	Stock trajectory is following the increasing evolution seen in past years and F is following the decreasing evolution seen in past years. F/FMSY is higher than 1 [1.75–1.07] while biomass shows a positive trend (B/Bpa ranges between 2.6–1.3). Reference points will be re-estimated according to the agreed roadmap.
29	Piked dogfish (*Squalus acanthias*)			-	-	-	-	-	-	Depleted	Implement long term management plan	Precautionary advice was provided based on previous advice and new information. Previous assessments showed that F current was estimated as being 9.6 times higher than the calculated Funique assumed in 2017 (Funique from ICES 2014). The population was thus still considered depleted and F should be reduced by more than 90 percent and a long term management plan established.

GSA	Species	Methods	Time series of catches used in the final model	$F_{current}$ *$E_{current}$	F_{unique} *E=0.4	F/F_{unique} *E/E=0.4	$B_{current}$	B_{MSY} *B_{pa} **B_{lim}	B/B_{MSY} *B/B_{pa} **B/B_{lim}	Stock status	Scientific advice	Comments (SGSABS/WGBS)
29	European Sprat (*Sprattus sprattus*)	SAM	1997–2020	Fcurr = 0.53 (0.37-0.76) *Ecurr = 0.36 (0.28-0.45)	*E=0.4	*Ecurr/E0.4 = 0.9 (0.7 – 1.13)	190 865 tonnes			Sustainable exploitation	Do not increase fishing mortality	The advice was based on a much improved SAM model including additional datasets compared to the benchmark session of 2018. Results of the XSA runs performed corroborated the results of the SAM. Quantitative advice was provided and the stock was considered in sustainable exploitation. A roadmap was agreed towards the finalization of the benchmark.
29	Horse mackerel (*Trachurus mediterraneus ponticus*)	XSA	2005–2020				-	-	-	In overexploitation	Reduce fishing mortality	Despite significant improvements in input data (notably catch--at--age 0), precautionary qualitative advice was given on the status of the stock, owing to issues related to the fact that nominal CPUE was used as a tuning index and slightly high residuals were evident in the older ages. The use of a nominal CPUE index (sliced into ages using a catch at age matrix from the catches themselves) from Turkey to tune the XSA model was challenged and an agreement was reached on performing its standardization before the next SGSABS in 2022. Further investigation of the acoustic survey data was deemed important, as was the need to collect as complete a dataset as possible from all Black Sea countries, including on discards.

GSA	Species	Methods	Time series of catches used in the final model	$F_{current}$ $*E_{current}$	F_{unique} $*E=0.4$	F/F_{unique} $*E/E=0.4$	$B_{current}$	B_{MSY} $*B_{pa}$ $**B_{lim}$	B/B_{MSY} $*B/B_{pa}$ $**B/B_{lim}$	Stock status	Scientific advice	Comments (SGSABS/WGBS)
29	Red mullet (*Mullus barbatus*)	XSA	1990–2020	0.81	0.65	1.3	-	-	-	In overexploitation	Reduce fishing mortality	This assessment presented significant advances with respect to previous years, especially in terms of input data. In particular, the Turkish commercial CPUE was recalculated and the demersal survey for eastern Turkey in autumn was deemed to now have a long enough time series to be used in the model. Attempts were made to include a tuning index from the Bulgarian mid-water trawl survey but it increased the noise and did not provide significantly different results. The M vector used in 2018 SGSABS was used. The improvement in data quality allowed quantitative advice to be provided, showing a stock in overexploitation for which F should be reduced.
29	Whiting (*Merlangius merlangus*)	XSA	1994–2020	-	-	-	-	-	-	In overexploitation	Reduce fishing mortality	The input data for this assessment were revised and improved and additional tuning indices were used (Turkish bottom trawl and Bulgarian mid water trawl surveys). This resulted in a significantly improved assessments with all models run consistently revealing fishing mortality rates over six times higher than the target F. Nevertheless, the poor internal consistency of some of the datasets-at-age and the marked pattern in the residuals of most datasets prompted the SGSABS to agree on providing qualitative precautionary advice for this species based on the outcomes of the XSA run including all tuning indices. The stock was considered in

GSA	Species	Methods	Time series of catches used in the final model	$F_{current}$ *$E_{current}$	F_{unique} *E=0.4	F/F_{unique} *E/E=0.4	$B_{current}$	B_{MSY} *B_{pa} **B_{lim}	B/B_{MSY} *B/B_{pa} **B/B_{lim}	Stock status	Scientific advice	Comments (SGSABS/WGBS)
												overexploitation and the advice was to reduce F on a precautionary basis. Future work should concentrate on the inclusion of discards in the assessment, the standardization of nominal CPUEs and an analysis of all survey data.
29	Rapa whelk (*Rapana venosa*)	*SS3 Separable VPA	1988–2020	-	-	-	-	-	-	In possible overexploitation	Do not increase fishing mortality	The stock was assessed with SS3 and separable VPA; they gave very consistent results with increasing F (Current F from SS3 is at Fmsy [F/Fmsy = 0.92] and above F0.1 [F/F0.1 = 1.02]) and decreasing SSB and recruitment. In view of the consistent, deteriorating, signals, qualitative advice is provided based on the SS3 model. The Black Sea rapa whelk stock was considered in possible overexploitation and fishing mortality should not be increased on a precautionary basis.

**Technical elements for the management of piked dogfish (*Squalus acanthias*)
in the Black Sea**

1. Scope

The management plan should cover the Black Sea, corresponding to geographical subarea (GSA) 29.

It is foreseen to be carried out in a two-step approach as follows:

Step 1: the establishment and implementation of transitional management measures while collecting relevant information under the hat of a regional research programme;

Step 2: based on the information collected, future advice and an analysis of the effectiveness of the transitional measures as well as the evaluation of additional potential measures, the second step will be aimed at identifying adaptive measures in view of a multiannual management plan for piked dogfish.

2. Background

Elasmobranchs are in general highly vulnerable to overfishing due to their life history characteristics that include long life span, late sexual maturity, large size at birth and low reproductive rates (Stevens *et al*., 2000; Cavanagh and Gibson, 2007; Ferretti *et al*., 2010; Oliver *et al*., 2015; Dulvy *et al*., 2016; da Silva Rodrigues Filho and Bráullio de Luna Sales, 2017). Fisheries remove young and often larger individuals, causing a general decline in size of populations (Bargione *et al*., 2019). The decline is even more dramatic on elasmobranchs populations living in semi-enclosed basins such as the Mediterranean and the Black Sea (Serena, 2021). In fact, while *S. acanthias* is globally listed by the International Union for the Conservation of Nature (IUCN) as "vulnerable", in the Mediterranean Sea it is classified as "endangered" (Ellis *et al*., 2016).

In 2019, the eighth meeting of the Working Group on the Black Sea (WGBS) recommended technical elements be drafted to support future management of piked dogfish in the Black Sea, towards the possibility of the future implementation of a long term management plan for this species. This was endorsed by the forty-third session of the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO).

3. Fisheries

In the Black Sea, piked dogfish has a low commercial value and it is largely caught as incidental catch of the bottom and pelagic trawl fleets targeting turbot, red mullet, anchovy and whiting, among other valuable commercial fishes. Other types of fishing gear, such as purse seines, longlines and gillnets, contribute to bycatch of *Squalus acanthias*, but to a lesser extent. In Georgia, Romania, Turkey and Ukraine the species is caught as bycatch of fisheries targeting more valuable fish resources, while a seasonal longline fishery (53 longlines) targeting dogfish still exists in Bulgaria. In Romania, for example, the piked dogfish is caught as bycatch, mainly by gillnets using mesh sizes of 400 mm.

Due to high bycatch rates in the mentioned fisheries, the landings of *S. acanthias* have dramatically dropped since the early 2000s (Figure 1) and piked dogfish is disappearing from its distribution area.

4. Status of the stock

Assessments performed within the GFCM Subregional Group for the Stock Assessment in the Black Sea (SGSABS) since 2014 have consistently revealed a depleted stock in urgent need of a long term management plan containing emergency measures to allow the recovery of the piked dogfish in the Black Sea. This situation was confirmed in 2021 when an in-depth reflection on the information available for this species and the improvements needed to ensure future advice for this stock was triggered with a priority given to improving the information available on the stock, both fisheries-independent and fisheries-dependent (e.g. bycatch rates) (FAO, 2020).
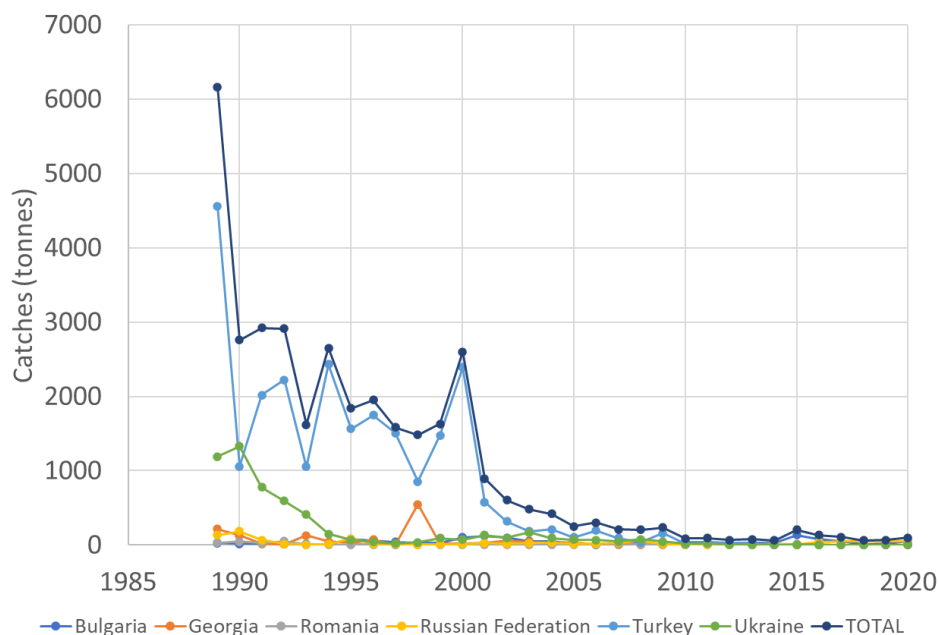

Figure 1. Piked dogfish catch in the Black Sea (1989–2020)

5. Improved data to inform management: a regional research programme on piked dogfish

In order to ensure advice is based on complete information and to inform on the most effective future measures a number of targeted activities and actions are identified as follows:

- Understanding biological parameters over the entire Black Sea basin;

- Harmonization of biological data collection: collect length and sex information of all individuals caught, also those below the landing size as there seem to be a bias towards adult individuals within the data collection process;

- Optimization of existing bottom trawl surveys in time and space to better describe the species;

- Understanding the age structure of the population including through a workshop on ageing techniques of piked dogfish in order to gain standardized age information across the Black Sea;

- Quantification of bycatch (discards and incidental catch) through the continuation and enhancement of onboard observer programmes, to assess the status of the population, better identify and describe the bycatch behaviour and analyse the spatial and temporal distribution of bycatch;

- Reduction of piked dogfish mortality caused by bycatch, taking advantage of high post-capture survival rate observed in trawl and gill nets through training of fishers;

- Implementation of tag-and-release programmes to better understand population dynamics and movement patterns;

- Socio-economic study of the target fishery in Bulgaria.

The actions and acitvities should be carried out as soon as possible during Step 1 (the transitional period) – within the framework of a regional research programme – to inform the adoption of longer term adapative measures while precautionary measures are implemented.

In addition to the above, it is important that during the transitional phase an awareness campaign be carried out to facilitate increased the collaboration of fishers while also promoting a decrease in post-release mortality.

6. Existing and potential management measures

6.1 Existing measures at GFCM level

The GFCM adopted a recommendation on piked dogfish in 2015 (Recommendation GFCM/39/2015/4 on management measures for fisheries exploiting piked dogfish and/or having piked dogfish as significant bycatch) introducing a minimum conservation reference size of 90 cm; accordingly, specimens of piked dogfish smaller than 90 cm shall not be retained on board, transshipped, landed, stored, sold, displayed nor offered for sale. When incidentally caught, such specimens shall be promptly released unharmed and alive, to the extent possible.

6.2 Existing measures at national level

At a national level, specific management measures for piked dogfish are adopted by Black Sea countries, are summarized in Table 1.

Further, piked dogfish is listed in Annex III – List of species whose exploitation is regulated – of the Barcelona Convention Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) and identified by the GFCM as a conservation-priority species (Serena, 2021). According to GFCM Recommendation GFCM/36/2012/3 on fisheries management measures for the conservation of sharks and rays in the GFCM area of application and Recommendation GFCM/42/2018/2 on fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3, fishing of sharks species listed in Annex III is allowed in the Mediterranean and the Black Sea, but the reporting of any single catch to the GFCM by contracting parties and cooperating non-contracting parties (CPCs) is mandatory by means of the national reports to the GFCM Scientific Advisory Committee on Fisheries (SAC)/WGBS and/or the Data Collection Reference Framework (DCRF) platform. Nonetheless, data on the catch/bycatch of the species are largely unavailable, including from GSA 29.

Table 1. Specific management measures for piked dogfish (*Squalus acanthias*) established in Black Sea countries (GFCM, 2017)

Management measure	Bulgaria	Georgia	Romania	Russian Federation	Turkey	Ukraine
Target fisheries	Longline target fishery: TAC (catches 2015) = 133 tonnes	Prohibited since 2015		Catches allowed with bottom-set gillnets, with mesh size greater or equal to 120 mm	Prohibited since 2016	Prohibited since 2017
MCRS	90 cm (TL)	85 cm (SL)	120 cm (TL)	85 cm (SL)		85 cm (SL)
Spatial restrictions						Fishing in the coastal main mating areas (depths of about 20 m adjacent to the Tendra Spit and Karkinitsky Bay) is prohibited
Temporal restrictions			Fishing prohibited from 15 March–30 April every year			
Other			Catching mature females prohibited			

6.3   Potential measures and management suggestions

Taking into account the low reproductive potential of the species in terms of gestation time and individual fecundity (Dell'Apa, Bangley and Rulifson, 2015; Ole, Junge and Knutsen Myrlund, 2019; Bargione *et al.*, 2019), the risk that bycatch and direct fishing are reducing the stock of breeding animals below the limit beyond which the Black Sea population is no longer able to recover (Camhi *et al.*, 1998; Fordham 2009) is real and must be reverted with any kind of means.

In order to achieve this ultimate goal the following actions and measures should be considered.

Management measures	Suggestions
Reporting obligations	Enhancement of a reporting protocol including: • Catches by length and sex • Location of authorized landing points
Participatory restrictions and control measures	A specific fishing authorization scheme to operate in this fishery should be implemented
Spatial and/or temporal restrictions	Protect identified nursery/mating areas Avoid bycatch
Gear restrictions	Technical mitigation measures (e.g. grids) to avoid bycatch
Restocking	Focusing on protecting pregnant females, including through ad hoc partnerships with public aquaria

These measures are also proposed to trigger the recovery of similarly at-risk populations of piked dogfish in other areas of the world (see Dell'Apa, Bangley and Rulifson, 2015 for a review of measures) and of the Mediterranean Sea (e.g. the northern Adriatic Sea), where the shallow northern-central part is one of the most suitable fishing grounds of mixed multi-specific demersal fisheries in the Mediterranean, which have already caused a decrease in elasmobranchs diversity and abundance including piked dogfish (Bargione *et al.*, 2019).

Piked dogfish is a highly mobile species with extensive seasonal, migrations so, to be effective, any adopted measures should be implemented at the same time with the same efforts and means in all countries in a harmonized manner.

References

Bargione, G., Donato, F., La Mesa, M. *et al*. 2019. Life-history traits of the spiny dogfish *Squalus acanthias* in the Adriatic Sea. *Sci Rep* 9, 14317 [online]. [Cited 5 August 2021}. https://doi.org/10.1038/s41598-019-50883-w

Carpentieri, P., Nastasi, A., Sessa, M. & Srour, A., eds. 2021. *Incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: a review.* GFCM Studies and Reviews No. 101. Rome, FAO.

Cavanagh, R.D. & Gibson, C. 2007. *Overview of the conservation status of cartilaginous fishes (Chondrichthyans) in the Mediterranean Sea*. Gland and Malaga, IUCN.

da Silva Rodrigues Filho, L.F. & Bráullio de Luna Sales, J. 2017. Introductory Chapter: the elasmobranchs as a fishery resource. In L.F. da Silva Rodrigues Filho & J. Bráullio de Luna Sales, eds. *Chondrichthyes: multidisciplinary approach*, pp. 3–12. London, IntechOpen.

Dell'Apa, A., Bangley, C. W. & Rulifson, R. A. 2015. Who let the dogfish out? A review of management and socio-economic aspects of spiny dogfish fisheries. *Reviews in Fish Biology and Fisheries* 25, 273–295.

Dulvy, N.K., Allen, D.J., Ralph, G.M. & Walls, R.H.L. 2016. *The conservation status of sharks, rays and chimaeras in the Mediterranean Sea.* Malaga, IUCN.

Ferretti, F., Worm, B., Britten, G.L., Heithaus, M.R. & Lotze, H.K. 2010. Patterns and ecosystem consequences of shark declines in the ocean. *Ecology Letters*, 13: 1055–1071 [online]. [Cited 5 August 2021]. https://doi.org/10.1111/j.1461-0248.2010.01489.x

Mandelman, J.W. and Farrington, M.A., 2007. The estimated short-term discard mortality of a trawled elasmobranch, the spiny dogfish (*Squalus acanthias*). *Fisheries Research*, 83(2–3), 238–245.

Ole Thomas Albert, Claudia Junge, Marlén Knutsen Myrlund, 2019. Young mums are rebuilding the spurdog stock (*Squalus acanthias* L.) in Norwegian waters, *ICES Journal of Marine Science*, 76(7): 2193–2204 [online]. [Cited 5 August 2021]. https://doi.org/10.1093/icesjms/fsz156

Oliver, S., Braccini, M., Newman, S.J. & Harvey, E.S. 2015. Global patterns in the bycatch of sharks and rays. *Marine Policy*, 54: 86–97.

Rulifson, R. A. (2007). Spiny dogfish mortality induced by gill-net and trawl capture and tag and release. *North American Journal of Fisheries Management*, 27(1), 279–285.

Serena, F. 2021. Elasmobranchs. In Carpentieri, P., Nastasi, A., Sessa, M. & Srour, A., eds. *Incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: a review*, pp. 113–197. GFCM Studies and Reviews No. 101. Rome, FAO.

Stevens, J.D., Bonfil, R., Dulvy, N.K. & Walker, P.A. 2000. The effects of fishing on sharks, rays, and chimaeras (chondrichthyans), and the implications for marine ecosystems. *ICES Journal of Marine Science*, 57(3): 476–494.

Concept note for a pilot project to assess cetacean bycatch in Black Sea turbot fisheries and to test measures to mitigate the incidental catch of cetaceans

BACKGROUND

Three species of cetaceans, the Black Sea common bottlenose dolphin (*Tursiops truncatus ponticus*), the Black Sea short-beaked common dolphin (*Delphinus delphis ponticus*) and the Black Sea harbour porpoise (*Phocoena phocoena relicta*) inhabit the basin of the Black Sea.

All Black Sea riparian countries have ratified or acceded to international treaties that stipulate a commitment to protecting biodiversity (e.g., the Convention on Biological Diversity, 1992) and protection of endangered marine species through responsible fishing practices (e.g., the Code of Conduct for Responsible Fisheries, FAO, 1995). Recommendation GFCM/37/2013/2 on the establishment of a set of minimum standards for bottom-set gillnet fisheries exploiting turbot and for the conservation of cetaceans in the Black Sea endorses i) contracting parties and cooperating non-contracting parties (CPCs) shall adopt fisheries management measures in the Black Sea region to ensure the adequate conservation of turbot (*Scophthalmus maximus*) and ii) CPCs shall adopt fisheries management measures to study, monitor, prevent, reduce and, to the extent possible, eliminate incidental catch of cetaceans during fishing operations.

Bycatch in fishing gear constitute the major source of human-induced mortality of Black Sea cetaceans. In terms of geographical location of these bycatch events, higher rates are reported from concentrated areas of bottom set gillnet fisheries, in the western waters off the Crimean peninsula, in concentrated areas off the Bulgarian and Turkish coasts, and beyond Romanian territorial waters. By species, porpoises almost always dominate bycatch (often greater than 90 percent of annual estimates). With regards to fishing gear type, bottom set gillnets for turbot are always recorded as the greatest.

The aerial surveys carried out in the Black Sea in 2019 under the umbrella of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) survey initiative estimates abundance of Black Sea harbour porpoise as 94 219 (CI 85 430–109 750). Unfortunately, no systematic regional bycatch observer programme results exist for this species. But results obtained from local and short term studies raise a general concern that bycatch rates are likely exceeding conservation limits and further work is required to quantify cetacean bycatch, and fishing fleet structure in the Black Sea.

Reports indicate that generally there is too little spatially explicit information on bycatch rates to establish geographical 'hot-spots' with any degree of certainty; nevertheless, the results obtained suggest higher cetacean bycatch (mainly harbour porpoises) in the late spring and early summer, off the Crimean peninsula, central Turkey, Bulgaria and Romania, in the turbot gillnet fisheries.

Acoustic warning devices (pingers) could help reduce harbour porpoise bycatch. They emit loud noises that keep marine mammals at a distance, but also exclude them from their habitat and feeding grounds. Several acoustic repellents have been tested to reduce the porpoise bycatch in the Black Sea. However, so far no significant long term success has been achieved. Probably because pinger noise startles harbour porpoises, reducing echolocation activity, which may lead to higher bycatch.

The more recently developed porpoise alerting device (PAL) imitates harbour porpoise alarm signals at a frequency of 133 kHz, which is the one the animals use, causing them to increase their echolocation activity, improving their ability to detect the nets. PAL has proven effective in protecting harbour porpoises from gillnets in the western Baltic Sea, with a 70 percent bycatch reduction, after a two-year trial period, and some promising results being collected in Spring 2021 off the Bulgarian coast.

In another recent study, presented by the Working Group on Fishing Technology (WGFiT) 2021, an acoustically visible standard gillnet modification was tested in central southern Black Sea commercial turbot fishery. In ten trips, the bycatch rate of harbour porpoises was compared between a standard

turbot gillnet and a turbot net equipped with small acrylic glass spheres, which acted as passive alerting device. The modified gillnet caught fewer harbour porpoises in absolute numbers, however, the difference was not statistically significant. Due to the low number of observations, no final conclusion could be drawn, and it was recommended to conduct more test trials as well as investigate the underlying cause of harbour porpoise bycatch further.

It is expected that any potentially acceptable bycatch reduction device on cetaceans will come at a cost which has to be adequately investigated and quantified and the potential trade-offs examined. In this sense, the involvement of fishers in designing and trailing these selective measures in real commercial conditions is the key to obtaining a holistic understanding of the net positive effects of such measures.

PILOT PROJECT

Aims

The aims of this pilot project are to:

1. assess cetacean bycatch in Black Sea turbot fisheries;

2. test mitigation measures by using acoustic and passive alerting devices; and

3. estimate effect of such measures on commercial fishing practices.

Actions

At all stages of the pilot project, the work will fully involve commercial turbot gillnetters and observers

Step 1: estimation of spatial and temporal distribution of active fishing effort

This will be carried out by port visits. Fishers will be asked lengths of their nets (km); number of days these nets are used each month; common fishing grounds; ties and locations of high incidence of cetacean bycatch in a way to demonstrate monthly fishing intensity, areas and cetacean bycatch hotspots. The target here is to reach all vessel operators using turbot gillnets face to face or if necessary by phone, where possible. To reach this aim, the cooperation of national fishery officers at local level is crucial. A sample study of such kind was previously conducted in southern Turkish coast white grouper longline fishery in cooperation with DG Fisheries, in a short time span.

Step 2: work at sea

It is envisaged that the experimental adoption of using acoustic and passive alerting devices will take place for a well-defined period of time during the fishing season, to be decided also taking into account seasonal issues (e.g. catches, prices, mortality, etc.), when evaluations of effectiveness will be performed simultaneously and on a large geographical scale during regular fishing operations on commercial fishing grounds.

Thus, the sampling strategy for the selective devices and control assessments is foreseen to be standardized and comprising parallel operations using commercial vessels fishing with a regular commercial turbot nets (control) and with alerting devices, over consecutive/same days in the same area.

During the experimental period, detailed information on target and bycatch, for both the original and the experimental fishing gear should be collected. Detailed economic information on the sales of the catch from both sources, and cost of the damage to gear due to depredation will also be required. Work will be carried out initially by researchers, then by either researchers or onboard observers.

Step 3: extending the coverage

In order to ensure an even wider geographical coverage, and consequent significance of future results, the work of the pilot project in the pilot cites is proposed to be planned as a concerted action with other

initiatives of this kind being carried out elsewhere in the Black Sea, such as, the northern Black Sea or western Black Sea, through the use of common methodologies.

Step 4: data analysis

The results from field trials will be analysed statistically within a standardized analysis framework of catch analysis.

Conclusions on the effectiveness of the experimentally adopted alerting devices in reducing bycatch and discard will emanate from a compared analysis among parallel fishing operations, among fleets, net features, fishing grounds, and pilot sites.

List of species of interest for recreational fisheries

ANNEX 1. GFCM DCRF priority species list – species of interest to recreational fisheries

Scientific name	FAO 3-alpha code	Black Sea 28, 29, 30 Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)*	DCRF species group
GFCM subregions ▶		**Black Sea**	
GSAs ▶		28, 29, 30	
Countries ▶		Bulgaria, Georgia, Romania, Turkey, Ukraine (Russian Federation)*	
Merlangius merlangus	WHG	x	Group 1
Mullus barbatus	MUT	x	Group 1
Scophthalmus maximus	TUR	x	Group 1
Trachurus mediterraneus	HMM	x	Group 1
Subtotal - Group 1 species per subregion		**4**	
Sarda sarda	BON	x	Group 2
Subtotal - Group 2 species per subregion		**1**	
Sharks and rays[2]	-	x	ALL
		1	
Total species per subregion		**6**	

ANNEX 2 - Additional main species of interest for recreational fisheries by subregion and fishing modality

Scientific name	FAO 3-alpha code	Black Sea
Belone belone	GAR	Modality: shore fishing & boat fishing Rationale: 1, 3, 5, 7
Mugil cephalus	MUF	Modality: shore fishing & boat fishing Rationale: 1, 2
Pomatomus saltatrix	BLU	Modality: shore fishing & boat fishing Rationale: 1, 2, 3, 4, 5, 7
Total species per subregion		**3**

Rationale:

1. species with a high volume of landings from recreational fisheries;

2. species with an important social impact for recreational fisheries (e.g. quality of recreational fishing experience, preference of fishers, etc.);

3. species with an important economic impact for recreational fisheries (e.g. species driving tourism, etc.);

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[2] Any species caught during recreational fisheries activity.

4. species at risk of overexploitation and/or for which a steep decrease in abundance has been observed;

5. species of conservation interest (e.g. endangered, vulnerable, etc.);

6. non-indigenous species; and

7. main species of commercial interest for small-scale fisheries (by volume and by value).

GFCM database on sensitive benthic habitats and species: proposal for a data call

Rationale

The rationale for the call is that the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO) maintains updated a database on sensitive benthic habitats and species[3] containing information on the distribution and abundance of habitats and species considered to be indicators of vulnerable marine ecosystems (VMEs) across the Mediterranean and the Black Sea. This GFCM database aims to store and make available all known VME indicator records in the Mediterranean and Black Sea (also covering deep water areas inside and outside national jurisdiction) for use by GFCM Scientific Advisory Committee on Fisheries (SAC) and the Working Group on the Black Sea (WGBS) and the wider community of Mediterranean and Black Sea experts. The SAC/WGBS is expected to use the database to underpin the provision of scientifically-robust advice on the distribution of VMEs and possible management measures to avoid significant adverse impact (SAI) of fisheries on vulnerable ecosystems.

Preparatory step (one-time only)

Before the end of 2021, the GFCM Secretariat will request its contracting paries and cooperating non-contracting parties (CPCs), by means of the SAC/WGBS focal points, to identify and nominate a national focal point for VME-related data. Considering that a relevant part of the available data is expected to come from fisheries-independent surveys (e.g. MEDITS survey), it is suggested that for European Union Member States, this person be the European Union data collection focal point, while for non-European Union countries this person be the GFCM surveys-at-sea focal point, if any.

Data call

In early 2022, and thereafter every year in the same period, the GFCM Secretariat will issue via email an official data call to the VME-related data focal points identified by CPCs as well as to third parties such as NGOs, other international organizations, independent experts, etc. The data call will include the adopted Excel template for the data entry adopted by the SAC, detailed indications on the type of data to provide and relevant instructions. A deadline allowing sufficient time for data gathering will be identified and communicated to the recipients of the data call.

Quality Control

Upon reception of the data from both CPCs and third parties, the GFCM Secretariat shall ensure a quality control (QC) to check the goodness of data prior to their inclusion into the database. Dedicated independent experts will perform the QC to make sure that a series of criteria are met, e.g. the data template has been filled in with all mandatory fields (records have a depth, at least one abundance index, coordinates) and the proper classification of VME habitat, indicators, taxa is provided, etc. The data providers can be contacted if clarification or corrections are needed.

End of the process

Upon conclusion of the QC, the new data will be transferred to the database and made available to users for consultation and analysis. The GFCM Secretariat will inform promptly its VME-related data focal points as well as the wider community of Mediterranean experts with interest in the database.

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[3] https://gfcm.sharepoint.com/SBHS

Final remarks on the use of the GFCM Database on sensitive benthic habitats and species

The database will remain available anytime during the year for experts to run analyses, elaborate proposed scientific advice and to explore the potentialities and capabilities of the tool. The use of data is allowed only according to GFCM data confidentiality policy provided upon access to the database. Results of analysis will then be presented to relevant GFCM meetings including ad hoc meetings, such as the GFCM Working Group on Vulnerable Marine Ecosystems and Essential Fish Habitats (WGVME-EFH), and/or the subregional committees (SRCs). The GFCM Secretariat remains available to organize and provide technical assistance to the experts and to improve the associated functionalities of the database upon request.

List of proposed benchmark assessments

	Species	2021/2022	2022/2023	2023/2024
Small pelagic stocks	Black Sea anchovy	Work towards finalization of benchmark		
	European sprat	Finalization of benchmark (July 2022)		
	Horse mackerel		Preceded by data preparation	
Demersal stocks	Turbot	Estimation of reference points (April 2022)		
	Whiting			Preceded by data preparation

Terms of reference and work plans for selected activities

Appendix 10/i

Terms of reference for the revision of the framework for the provision of advice

The revision of the framework of advice will entail consultation with scientists and managers/administrations, including through meetings (a first one proposed by the first semester 2020), as well as a rethinking of the functioning of the Working Groups on Stock Assessment (WGSAs) of the General Fisheries Commission for the Mediterranean (GFCM) of the Food and Agriculture Organization of the United Nations (FAO). This process will be linked to the GFCM 2030 Strategy.

The revision should take into account the peculiarities of stocks/fisheries assessed (for example, pelagics vs demersals), with particular focus on priority species, and the following proposed terms of reference are suggested:

1. Review existing practices (methods, measures taken – indicators and reference points) for advice and management within the GFCM;

2. Review frameworks for the provision of advice in other regional fisheries management organizations and advisory bodies, with particular attention to be paid to those bodies providing advice for many species;

3. Revise the calendar for the provision of advice;

4. Address the provision of advice for data-limited situations and the formulation of precautionary advice, including a framework for providing advice when direct methods and/or harvest rates are used, as well as in data-poor/limited situations, including precautionary catch or effort advice;

5. Specify procedures for the estimation of reference points in different data availability situations, including:

    • reviewing reference points in adopted GFCM decisions and discuss technical approaches in relation to their estimation;

    • addressing biomass reference points (percentiles, trends and others) and guidelines on their use (especially with respect to short time series); and

    • addressing reference points for data-limited and new situations (e.g. spawning potential ratio).

6. Formulate a procedure for the performance of forecasts and provide guidelines on how to translate outcomes of scientific assessments into catch or effort advice towards monitoring the fishery vs the advice given;

7. Formulate a procedure for the performance of management strategy evaluation when needed, including the investigation of a range of possible measures, for example temporal/spatial measures and technical measures such as gear selectivity and exploitation patterns;

8. Review aspects related to the transmission of information on the status of stocks, including:

    • how to report data issues in terms of their use and problems, with particular reference to differences with official data on catch and effort, as well as the use of surveys in the assessment;

- how to report stock status (summary sheets); and

- how to report the outcome of benchmarking process.

9. Review the format and content of the elements for management plans.

Appendix 10/ii

Terms of reference for the data preparation meeting in the Black Sea

A data preparation meeting prior to the Subregional Group on Stock Assessment in the Black Sea (SGSABS) in 2022 will be held and is foreseen to last six days, focusing on three main elements:

- In-depth analysis of biological data available for all priority commercial species. This will foresee two main tasks:

  o Collation of all information, prior to the meeting, available in the literature and from ongoing monitoring projects for:

    i. growth parameters,

    ii. maturity,

    iii. spawning and recruitment periods and areas,

    iv. natural mortality estimates and methods for the estimation of vectors by age (e.g. Prodbiom, Gislason, Chen & Watanabe, Pauly, etc.),

    v. length-weight relationships,

    vi. age information.

  Stock coordinators for each species should be assigned to coordinate the work by species.

  o Analysis of collated information by species and choice of best parameters for use in subsequent analyses.

- In-depth analysis of tuning fleets:

  o Fishery-dependent indices: the use of nominal catch per unit effort (CPUE) should be analysed in depth for small pelagic species (Black Sea anchovy, European sprat and horse mackerel), as well as for turbot and whiting, addressing three issues in particular:

    i. The standardization of nominal CPUE using auxiliary data available on the fishery in order account for changes in catchability owing to external sources.

    ii. The use of environmental variables in the standardization should be investigated. Outcomes will also include a plan for future data collection towards improving the data available for standardization.

    iii. The use of catch at age from the fishery to slice the CPUE index into ages.

  o Fishery-independent (e.g. trawl surveys):

    i. In-depth analysis of the seasonality of survey indices for turbot, piked dogfish and red mullet. This will involve a scrutiny of disaggregated data by season, including length-frequency distributions;

ii. Based on the results achieved in point (i), the use of standardization methods to allow for the combination of seasons should be investigated taking into account both the biology of the species in question and environmental variables.

- The analysis of basic catch data, including an analysis of all available biological data e.g. length-frequency distributions and the parameters used to slice lengths into ages for commercial catch. This will also imply that all countries provide data at least on landings.

Appendix 10/iii

Terms of reference for the Working Group on Essential Fish Habitats (EFH) and Vulnerable Marine Ecosystems (VME)

General terms of reference

- Review, develop and propose methodologies for the definition, identification and analysis of relevant benthic species and habitats, the identification of fishing footprint, and other issues relevant for the advice on fisheries restricted areas (FRAs).

- Maintain liaison and contact with other relevant expert groups related to the provision of advice on spatial issues, including other GFCM expert groups (e.g. Working Groups on Stock Assessment [WGSAs]) as well as relevant working groups of partner organizations, such as the International Council for the Exploration of the Sea (ICES), Regional Activity Centre for Specially Protected Areas (SPA/RAC), etc.

- Address requests made from the SAC and Commission on issues related to FRAs, including on EFH and VMEs.

The GFCM work should focus on three main components, namely:

FRAs

The working group shall:

- review the proposals for the establishment of new FRAs and identify priorities or initiate the development of new proposals;

- analyse, in coordination with other relevant expert groups such as the WGSAs and the workshop on bioeconomic assessment of management measures (WKMSE), data from scientific monitoring of existing FRAs;

- make suggestions in view of establishing monitoring plan; and

- assess the effectiveness of the FRAs and their contribution to global targets.

EFH

The working group shall:

- compile the available information on EFH (e.g. from observations, models);

- prepare a draft advice on priority areas, species and critical life stages as well as suggest potential management measures; and

- advance on connectivity and network issues

VME

The working group shall:

- compile the available information on VME indicators (e.g. from surveys, fisheries);

- prepare a draft advice on priority areas and potential management measures; and

- provide other suggestions to minimize significant adverse impacts of fisheries on VMEs.

Specific terms of reference for the next session

In the next session, the working group should focus on:

- reviewing new and ongoing proposals for FRAs;

- consolidating the database on sensitive benthic habitats;

- consolidating the catalogue of EFH; and

- providing suggestions on potential management measures in line with the scientific evidence compiled.

Appendix 10/iv

Terms of reference for a pilot project on sturgeon

Several species of sturgeon (Acipenseridae) are present in the Black Sea basin; depending on the species, they are classified as critically endangered, endangered, or vulnerable species by the International Union for Conservation of Nature (IUCN). Potential mitigation of marine fisheries impacts on these species has been long overdue. In line with the conservation needs at national, regional and international level, a pilot project is proposed to be carried out under the hat of the BlackSea4Fish project, according to the following general terms of reference:

a) To collate all information available, including on the biology, ecology and distribution of the species, on their interaction with fisheries and on existing legislation, from relevant scientific literature, research projects, surveys-at-sea and monitoring programmes in the Black Sea as well as in consultation with national authorities, with the aim of informing a future discussion on management measures.

b) To collect information from each Black Sea riparian country on the fishing gear and methods involved in the bycatch of sturgeons, towards ensuring adequate monitoring and informing an assessment of bycatch

c) To assess and, where possible, quantify the sources of illegal, unreported and unregulated fishing affecting sturgeons.

Roadmaps for the assessment and management of key fisheries

Roadmap for future work on Black Sea anchovy

1. Work on data

1.1 Age, growth and migration at Black Sea level

The need to investigate the following three main issues was identified: a) the length-frequency distributions (LFD), b) ageing and otoliths and c) migratory patterns. Together information on these aspects will shed light on variability in growth at a basin level and allow for the consideration of the peculiarities of the life cycle of the species as it varies across the region.

The first action proposed under this theme was a workshop to set a process to review the issue at a basin scale. This should take place as soon as possible in order to identify and collate all available information and start the practical work towards collecting new data, which by theme, according to future actions, are as follows:

a) LFD:

- o Review the sampling efforts and methodologies with respect to LFDs of anchovy in the catches in all countries

- o Retrieve LFDs from the past

  - Georgia in 2009, 2010 and 2012 (possible)

  - Romania

  - Bulgaria

  - Others

b) Otoliths:

- o Retrieve otoliths:

  - Georgia: from (2015) 2017

  - Romania: from 2008 to today

  - Bulgaria: back to the 1960s maybe

  - Others

c) Review migration patterns over time and information available (discuss juvenile and/or egg and larvae surveys).

d) Discrimination of Azov and Black Sea larvae.

e) Phenology: evidence of changes in the timing of spawning? In relation to climate change?

f) Make a plan for future work and establish a process forward.

1.2 Standardization of Turkish catch per unit effort (CPUE) indices

- Work towards better addressing the issue of hyperstability in CPUE by using vessel monitoring system (VMS) data to quantify search time and the issue of vessels coming together to search.

  - Investigate composition of the vessels contributing to the CPUE indices and possibly establish reference fleet(s).

1.3 Acoustic survey

- Investigate the effect of sampling location (offshore vs coastal) on the perception of the stock provided by the Turkish acoustic survey.

- Work towards a standardized acoustic survey covering the main area of the fishery (at least Turkey and Georgia) and beyond – facilitated by BlackSea4Fish project.

- Ensure there are no gaps in the future time series.

This work should be followed by the launch of a regional reflection on ageing and modelling of these fast-growing short-lived species (second stage).

The work should encompass all Black Sea riparian countries and as such is foreseeable to be coordinated by the BlackSea4Fish project.

2. Finalization of the Benchmark

- Organize an intermediate session of the benchmark to investigate alternative modelling approaches.

- Finalize the benchmark once all issues are resolved.

3. Other activities

Transfer of knowledge

Two main areas were identified as in need of further transfer of knowledge:

  i. Ageing, including:

  - greater detail in the existing protocol with the aim of distributing it for wider use; and

  - further hands-on transfer of knowledge on otolith reading.

  ii. Assessment and modelling

Appendix 11/ii

Roadmap towards further management of Black Sea turbot

1. Estimation of reference points and finalization of the benchmark

In response to the requests of the eight meeting of the Working Group on the Black Sea (WGBS) (2019) and in order to fulfil the requirements of Recommendation GFCM/43/2019/3 amending Recommendation GFCM/41/2017/4 on a multiannual management plan for turbot fisheries in the Black Sea (geographical subarea 29), the Subregional Group on Stock Assessment in the Black Sea (SGSABS) proposed a roadmap, with a timeline, for the estimation of reference points for Black Sea turbot to be carried out before the SGSABS meeting of in July 2022.

The plan is to focus the work on continuing what was started during the 2019 benchmark and make use of eqsim (stochastic equilibrium reference point software) to provide maximum sustainable yield (MSY) reference points based on the equilibrium distribution of stochastic projections, under a number of different assumptions.

The work will be carried out in a stepwise manner, building on previous efforts while also foreseeing a significant capacity-building component. The final result of the roadmap will be the estimation of reference points and the finalization of the Black Sea turbot benchmark.

Step 1

1.1   A detailed description of the work done to date on the estimation of reference points for Black Sea turbot, including information on how the process works, the assumptions made and a detailed description of the preliminary results, will be compiled. This document will be circulated to all Black Sea experts for them to get acquainted with the work.

Deadline: October 2021

1.2   A workshop (maximum two days) will be organized to present the method and the outcomes and provide the opportunity to learn the basics of running eqsim in the context of Black Sea turbot.

Deadline: November 2021

Step 2

2.1   A session will be organized to investigate, discuss and decide all relevant assumptions that need to be made before running the final analyses.

Deadline: January 2022

Step 3

3.1   The estimation of reference points will be completed according to the decisions taken in Step 2 and final estimates will be provided.

Deadline: April 2022

Step 4

4.1   The update of the turbot assessment will be performed and the newly estimated reference point will be used to determine stock status and run short-term forecasts towards providing the scientific basis for the possible revision of the total allowable catch (TAC) to be discussed at the WGBS in 2022. Estimation of reference points will be completed according to the decisions taken in Step 2 and final estimates will be provided.

Deadline: SGSABS in July 2022

2.   Revision of seasonal temporal closures

Recommendation GFCM/41/2017/4 on a multiannual management plan for turbot fisheries in the Black Sea (geographical subarea 29) foresees that each of the contracting parties and cooperating non-contracting parties (CPCs) shall establish, each year, a closure period of at least two months during the spawning season of turbot (i.e. from April to June). The WGBS recommends to launch a reflection towards the most efficient period for this closure, taking into account available scientific evidence on the potential impact of alternative dates on the fisheries and the resources.

The need for a revision is determined by an observation in European Union countries that the spawning period of turbot is happening earlier in the season and bringing the start of the closure forward by at

least 15 days (between 15 April to 1 April) would likely provide better protection to the species during the spawning period.

This change would still be within the provisions of Recommendation GFCM/41/2017/4 but the WGBS deems the issue important enough to suggest that such revision be based on scientific evidence thus proposing to:

i. Collate all new information on the spawning period from all Black Sea riparian countries towards understanding whether a revision at the basin-scale may be needed and propose alternatives.

ii. Analyse the impact of any changes in the closure period taking into account all information available, including on the interaction between the turbot fishery and cetaceans.

Appendix 11/iii

Roadmap for the finalization of the benchmark assessment of European sprat in the Black Sea

Suggested date for final session of the benchmark: July 2022 back-to-back with the SGSABS plenary session, in the presence of an external reviewer

Data issues

Age reading

Work should advance on determining a protocol for age reading and interpretation of otoliths in different seasons and months, starting from efforts already made by the BlackSea4Fish project. To be done in a stepwise manner:

1. online session to determine the main issues to be addressed: October/November 2021; and

2. face-to-face meeting as soon as possible to work on otoliths, finalize a protocol and understand next steps.

Standardization of CPUE indices

- Turkey: before July 2022;

- Ukraine: to be facilitated by GFCM Secretariat and Black Sea4Fish project;

- Russia: to be facilitated by Black Sea4Fish project and Georgi Daskalov; and

- Bulgaria: depending on funding.

Modeling issues

SAM

- Incorporate improved data and explore further options (e.g. plus group).

- Perform capacity-building and transfer knowledge on the current model.

- Organize a workshop on the use of SAM for assessing small pelagic species for the entire GFCM area of application.

Estimate reference points

- Participate in the work planned for the estimation of reference points for turbot.

- Estimate reference points for European sprat.

Roadmap for the improvement of input data for the assessment of horse mackerel in the Black Sea

The SGSABS agreed on addressing the following aspects related to the input data of the horse mackerel (*Trachurus mediterraneus*) assessment in advance of the 2022 meeting of the SGSABS:

- further data exploration and improvement of data quality for all countries;

- standardization of the Turkish nominal CPUE; and

- possible inclusion of information on discards within the assessment.

In order to fulfill the above objectives, all available data by country should be put on the table for analysis towards optimizing their use and increasing the quality of advice, with particular reference to:

- available data on length frequency distributions of catch and surveys;

- available data on surveys, in particular acoustic surveys that have been collected but not yet analysed as well as new ones;

- available data to standardize tuning indices, including CPUE, e.g. georeferenced daily catches environmental data, VMS data, fishery and fleet data; and available data on discards.

Roadmap for the determination of technical elements for the management of Rapa whelk fisheries in the Black Sea

This roadmap is expected to be implemented in a step-wise approach, as follows:

1. Collation of all information on rapa whelk (*Rapana venosa*) fisheries in the Black Sea in particular as stemming from the regional Rapa whelk research programme established under Recommendation GFCM/42/2018/9 on a regional research programme for rapa whelk fisheries in the Black Sea (geographical subarea 29) into a detailed background technical document for this fishery (proposed table of contents in Annex 1), including:
   o Collation of all available data by country, including the information on the biology of the species, fishery-dependent and fishery-independent data (catch, effort) and socio-economic information.

   o Compilation of all existing management measures.

   o Identification of information gaps to guide future data collection towards improving the assessment of the stock at Black Sea level and the assessment of the socio-economic impact of rapa whelk fisheries in all countries.

   Timeline: by December 2021.

2. Organization of a stakeholder workshop to:

   2.1 Identify potential additional management measures applicable to the rapa whelk fishery in the Black Sea, also based on the information collated in Point 1 above.

   2.2 Perform a qualitative appraisal and assessment of the potential effectiveness of existing and potential management measures, also accounting for different fleets

based on the data collated in Point 1, including through the use of ranking methods where the effect of each management measure under a given scenario is given a qualitative score based on technical experience towards producing aggregated scores contributing to an overall assessment of the different scenarios. This will be performed under the hat of the GFCM Workshops on the implementation of management measures in selected case studies in the Mediterranean and Black Sea (WKMEASURES). The presence of all stakeholders, fishers, fisheries and technical experts, including external experts, and administration experts, will be required, as a thorough and comprehensive consultation with relevant stakeholders is crucial to this process.

Timeline: by May 2022.

3. Based on the outcomes of Point 2, draft technical elements for management of rapa whelk fisheries for the consideration of the WGBS in 2022, including potential transitional management measures as well as potential measures to be integrated in a multiannual management plan

Timeline: WGBS 2022.

4. Finalization of the assessment of the status of the Rapa whelk stock in the Black Sea:

    4.1 Address data collection gaps as identified in Point 1, in particular those required to perform Point 4.2 below

    4.2 Finalize the assessment to provide quantitative advice of the status of rapa whelk in the Black Sea, taking into consideration all data collated under Points 1 and 4.1. Also based on the outcomes of Point 2.2 above, determine the most adequate reference points for this fishery and estimate their values, as well as perform a short-term forecast.

Timeline: SGSABS 2023.

5. Quantitative assessment of alternative management measures (management strategy evaluation) towards informing a multiannual management plan

Timeline: after the finalization of a quantitative stock assessment and taking into account any potential new measure agreed by GFCM CPCs

Appendix 11/v/Annex 1

Table of contents of the proposed background technical document in support of a management plan for rapa whelk (*Rapana venosa*) fisheries in the Black Sea (GSA 29)

1. Environmental and geographical settings

2. Biology and ecology of rapa whelk

3. Fishery-independent information

4. Fishery-dependent information

5. Socio-economic elements and markets

6. Fisheries governance and management frameworks

7. References

Presentations delivered at the meeting

Intersessional activities

General intersessional activities (WGBS Coordinator)

The Working Group on the Black Sea (WGBS) coordinator presented an overview of the general GFCM intersessional activities of 2019–2021 of relevance to the Black Sea on the basis of the priorities identified by the WGBS and of the work plan adopted by the Commission at its forty-third session. He mentioned activities carried out at the GFCM level in both the Black Sea and Mediterranean basins, such as: publications, issues related to data collection and quality indicators; activities related to scientific monitoring (socio-economic surveys and the discards monitoring programme); issues related to small-scale and recreational fisheries and issues related to the marine environment and ecosystems, including spatial management and fishing technology and selectivity. He then moved onto the specific activities carried out in the Black Sea, recalling the work of the Subregional Group on Stock Assessment for the Black Sea (SGSABS).

Intersessional activities of the BlackSea4Fish project (Outputs 1 and 5) (BlackSea4Fish project coordinator)

The BlackSea4Fish project coordinator presented an overview of the intersessional activities during 2019–2021. He described the structure and aims of the project and stressed the importance of cooperation with steering committee members. He then summarized the activities carried out under the project outputs 1 and 5, such as: workshop on harmonization and expansion of the existing demersal surveys, sprat otolith reading exercise, hydro-acoustic surveys for Black Sea anchovy in Turkish and Georgian Black Sea waters, data preparation meetings, Rapa whelk surveys and workshops, online presentations and scientific database. Then Black Sea sub regional coordinator presented contributions to conferences, meetings and workshops organized by relevant regional bodies such as Black Sea Commission, BSEC, ICBSS, EUROFISH, and Black Sea Advisory Council. He finally, briefed the group on the facilities of the new GFCM Sub-regional Technical Unit for the Black Sea in Burgas, Bulgaria.

Issues related to fisheries data collection, data quality and the provision of advice

Overview of data submitted in line with relevant GFCM decisions, and the application of data quality indicators on the DCRF online platform (GFCM Secretariat)

The GFCM Secretariat firstly provided a general overview of the fleet (number of vessels and main fleet segment), total landings and main species caught in the Black Sea on the basis of the information transmitted by Bulgaria, Georgia, Romania, Turkey and Ukraine. The second part of the presentation was focused on the application of quality indicators (timeliness, completeness, conformity, stability and consistency) to the fisheries information transmitted by the mentioned countries through the Data Collection Reference Framework (DCRF) online platform, including a summary of quality assessment results (data reference year 2019, as transmitted in 2020) for the Black Sea, which highlighted existing issues mainly in timeliness, stability and consistency. The results of the quality assessment demonstrated the need to strengthen the interactions between contracting parties and cooperating non-contracting parties and the GFCM Secretariat in relation to these quality assessments in order to improve the implementation of data quality indicators on the DCRF online platform and ultimately to increase the quality of data received.

Advances towards a revised framework for the provision of advice, including on stock assessment issues

In the context of the GFCM framework for the provision of advice, the GFCM Secretariat outlined the nine steps proposed to be taken towards its revision, and the fact that it would entail consultation with scientists, managers and administrations, and include a rethinking of the functioning of the Subregional Group on Stock Assessment for the Black Sea (SGSABS). In particular, focus was placed on the first step of the revision: a review of existing practice which entailed an expert meeting on stock assessment methodology, held online on 3–4 February 2021, as requested by the Commission at its forty-third annual session, whose outcomes were outlined.

Advances on research programmes, recreational fisheries and the implementation of the Regional plan of action for small-scale fisheries in the Mediterranean and the Black Sea (RPOA-SSF)

Recreational fisheries pilot studies and main species of interest for data collection (GFCM Secretariat)

The GFCM Secretariat presented the advice emanating from the Working Group on Recreational Fisheries (WGRF) which proposed a list of species of interest for recreational fisheries in the Black Sea. This list was produced by the WGRF experts, in view of focusing future work to further improve advice on the scope and impacts of recreational fisheries, and was composed of two parts: first, the WGRF experts selected species of interest to recreational fisheries from those species already listed in the GFCM DCRF priority species list; second, additional main species of interest for recreational fisheries (by fishing modality) were identified by WGRF experts in line with agreed criteria.

Monitoring of RPOA-SSF implementation (GFCM Secretariat)

The GFCM Secretariat presented select conclusions of the WGRF of relevance to the RPOA-SSF, namely the agreed RPOA-SSF short-term priority action to address interactions between small-scale fisheries and recreational fisheries. In particular, the WGRF encouraged the Working Group on Small-Scale Fisheries (WGSSF) to conduct a similar exercise to the one carried out by the WGRF to identify a list of species of interest for small-scale fisheries, in view of identifying a list of main coastal species, common to both small-scale and recreational fisheries. The WGRF concluded that such a list could focus efforts to improve knowledge on these species and ultimately facilitate advice to address interactions between small-scale and recreational fisheries.

Research programme on rapa whelk

Biological parameters of the rapa whelk in north-western Black Sea (Bohdan Hulak)

The presentation summarized the main biological parameters of rapa whelk in the northwestern part of the Black Sea. The annual life cycle of the rapa whelk was described. Information about the sex composition of the rapa whelk was presented. The age and size distribution, the rates and characteristics of growth of the rapa whelk in the north western part of the sea, were described. The mortality rates for males and females of rapa were calculated using the new ProdBiom script. Environmental factors of mortality of rapa in different age groups were discussed. A sampling scheme was proposed for age reading during surveys and fishery data collecting.

Results of the first Black Sea rapa whelk beam trawl survey (BlackSea4Fish project)

Initially considered a marine pest, rapa whelk from the Black Sea is now exported globally and represents multimillion dollar revenues for the Black Sea riparian countries. In 2018, the General Fisheries Commission for the Mediterranean (GFCM), adopted a Recommendation establishing a regional research programme towards the sustainable exploitation of rapa whelk (*Rapana venosa*) in the Black Sea: Recommendation GFCM/42/2018/9 on a regional research programme for rapa whelk fisheries in the Black Sea (geographical subarea 29).

The main objective of this programme was to organize the first standardized scientific survey for rapa whelk in the Black Sea, in order to investigate the biology of the species as well as to collect data for adequate stock assessment modeling.

The first rapa whelk surveys were carried out in the period September–October 2020. Six partners from five different Black Sea countries (Bulgaria, Georgia, Romania, Turkey, Ukraine) were involved in the survey as all of the parties followed the same survey protocol (vessel characteristics, sampling, gear, trawling speed, duration of trawling, surveyed stratums) and collected the same parameters (age, length weight, sex, etc.).

The main outcomes of the survey indicated that in the Black Sea:
- The rapa whelk agglomerates in the depth of 20 m.
- The average length of the rapa whelk is 60 mm.
- The highest abundance and biomass were registered in the north-western part of the Black Sea.
- The biggest specimens were registered in the deepest waters.

The results of this survey are considered preliminary, since this is the very first stage of *rapana* survey in the Black Sea. More comprehensive conclusions regarding the status of its stock will be possible after collecting information of few more years.

Rapa whelk: fishery-dependent data (Yevhen Leonchyk, Elıtsa Petrova, George Tiganov, Murat Dagtekin, Bogdan Hulak)

The objective of this presentation was to review rapa whelk fishery-dependent data collected by four Black Sea countries (Bulgaria, Romania, Turkey and Ukraine) and compiled during 'Data preparation meeting: Black Sea priority species' in 2021.

Before 1988, landings of all the Black Sea countries had been at a quite low level. In the Union of Soviet Socialist Republics (USSR) at that time, only divers collected small amounts for souvenirs mostly in the Crimean peninsula and in Caucasian areas. Rapa catches began increasing after the start of exporting to Asian countries and the depletion of commercial fish in the Black Sea. Russian Federation and Georgian landings remain negligible, often equal to zero. Intensive stock exploitation started much later in the northern part of the Black Sea. It significantly increased the total catches. However, in 2020, the export of rapa was reduced due to restrictions caused by the global pandemic.

The catch-at-length data were provided by all four countries but the time-series are still short. Rapa age reading started a few years ago in Ukraine. Romanian and Turkish scientists also started to collect age-frequency distributions. However, age data are fragmented. The lengths at first maturity were similar in both researched Turkish and Ukrainian areas.

The Turkish catch per unit effort (CPUE) series was provided as nominal values (landings divided by vessel numbers). We shall notice that this is the longest time-series but it is not standardized by vessel type or day/hour efforts. The Ukraine CPUE is catch per hour with a dredge. Romania and Bulgaria both have four CPUE series with beam trawls by different vessel types.

Bycatch by beam trawl fishery in the Bulgarian Black Sea waters (Elitsa Petrova)

In 2020, the scientific observations in the Bulgarian Black Sea waters covered 23 days on vessels with beam trawls. In spatial terms, the observations on beam trawl fishery encompassed the northern and central parts of the Bulgarian coast. The average value of the total catch (TC) was 2 005.78 kg/day ± 260.06 SE, and the average bycatch rate was 0.14% TC ± 0.10 SE. The study in 2020 covered three fishing segments, vessels with lengths of 6–12 m, 12–18 m and 18–24 m. The mean size of *Rapana venosa* from the target catch was 51.93 mm ± 6.47 SD, with an average weight of 22.72 g TW ± 9.27 SD. Size group 46–56 mm had the most significant presence in the *R. venosa* catches (61.62%). The species composition of bycatch by the *Rapana* fishery was diverse and included 46 species of fish, arthropods and molluscs, and a maximum of 21 species of marine organisms was found per day in beam trawls. The most common bycatch species were gobies (*Neogobius melanostomus*, *Mesogobius batrachocephalus*) and flounder (*Platichthys flesus*) in 48 percent of samples, turbot (*Scophthalmus maximus*) and stargazer (*Uranoscopus scaber*) in 30 percent of samples, sailfin dragonet (*Callionymus pusillus*) in 26 percent of the samples, and the species *Mullus barbatus*

and *Liocarcinus vernalis* were found in 22 percent of the studied samples. Molluscs (*Mytilus galloprovincialis*, *Mytilaster lineatus*, white mussels), decapods, Bryozoa and Polychaete were also found in the bycatch. The dominant species in the bycatch were the turbot and the white mussel *Anadara kagoshimensis*. The bycatch rate, expressed as a percentage of the total catch, had higher values in the small vessel segment, on average 0.78 percent and decreased in large vessels to 0.03–0.06% TC per day. In 2020, the turbot bycatch in the *Rapana* fishery was on average 0.153 kg/day (with a maximum in August) and formed 0.01–0.02 percent of the total catch. Turbot bycatch included two age groups – one-year olds, with an average size of 19.66 cm, mean weight of 123.33 g, and condition factor of 1.62, and two-year-olds with an average size of 34.3 cm, average weight of 515 g and condition factor of 1.18.

Stock assessment (GFCM Secretariat)

A summary was provided on the outcomes of the stock assessment of rapa whelk performed during the Subregional Group on Stock Assessment in the Black Sea (SGSABS) held online on 12–16 July 2021. Very significant improvements were noted in the assessment of this species. Two modelling approaches were used, the principal one being SS3, with the supporting outcomes of a simpler model, a separable virtual population analysis (VPA). The two modelling approaches gave very consistent results:
- Increasing fishing mortality (F) in both models (Current F from SS3 is at Fmsy [F/Fmsy = 0.92] and above F0.1 [F/F0.1 = 1.02])
- Decreasing spawning stock biomass (SSB) in both models
- Decreasing recruitment in SS3
- Spawning potential ratio (SPR) index from SS3 is at maximum sustainable yield (MSY) threshold (SPR/SPRmsy = 1.02) for recent years
- All indices used, except for the Ukrainian catch per unit effort (CPUE), showed the same decreasing signal.

In light of the limitations (the Turkish CPUE was nominal and not well-fitted by the SS3 model) and strengths of the models performed and in view of the consistent, deteriorating, signals provided by both models and all information, qualitative advice was provided for this stock based on the SS3 model. The Black Sea rapa whelk stock was deemed in possible overexploitation and fishing mortality should not be increased on a precautionary basis. Given the different situation of the fishery in the different countries of the Black Sea, SS3 is an adequate model as it is able to take into account all data separated by country. Future assessments will take advantage of more data, notably more points in the Black Sea rapa survey will shed light on the differential situation by country, in terms of catches and population at sea.

Determinants of economic efficiency: a case study of rapa whelk boats in the southern Black Sea (Murat Dağtekin, Serhan Candemir, Ali Çankaya, Gökhan Erik, Gülsüm Balçık Mısır)

Rapa whelk (*Rapana venosa*) is a species that entered the Black Sea later, has been caught since the 1980s. Seen as a danger to the ecosystem at first, this species has since become an important commercial species in the Black Sea basin. Accordingly, it is important to determine the economic activities of the fishing enterprises that catch rapa whelk, in the Black Sea basin. This study aims to calculate the effectiveness of the fishing enterprises and determine the factors that impact this effectiveness in the provinces of the Black Sea where *Rapana* fishing densely operated. The data obtained through face-to-face interviews with 452 boat owners constitute the main data of the study. It was determined that the age of the owner, the education period, and the length of the fishing boat positively affected the economic efficiency.

Rapa whelk management measures in the Black Sea (GFCM Secretariat)

On 7 July 2021 a survey form was sent out to the Black Sea countries asking for information on the current management measures applicable to rapa whelk in connection with Recommendation GFCM/42/2018/9 on a regional research programme for rapa whelk fisheries in the Black Sea. Reactions were received from Bulgaria, Romania, Turkey and Ukraine. The survey requested information that was

grouped into nine categories: (1) spatial restrictions, (2) temporal restrictions, (3) catch restrictions, (4) effort restrictions, (5) gear restrictions, (6) minimum size, (7) participatory restrictions, (8) limits to fishing capacity, and (9) other. The four countries have developed or have started developing management measures for rapa whelk specifically. For some types of measures in some of the countries, aspects of the general regime for fishing activities was submitted in the survey as covering rapa whelk fishing as well. The presentation showed that there is still ground for types of measures in some of the countries to be developed or to be better communicated in order to be able to present a comprehensive and coherent network of management measures for rapa whelk in the Black Sea.

Formulation of advice on marine living resources and fisheries management

Overview of the status of fisheries, including the status of stocks and vulnerable species (*GFCM Secretariat*)

The GFCM Secretariat presented the status of fisheries in the Black Sea, as emanating from the GFCM report on *The State of Mediterranean and Black Sea Fisheries* (SoMFi) 2020. The presentation focused on the status and trends of fleet, capture fisheries production, socio-economics, bycatch and the status of fishery resources, as well as on the management of fisheries, including small-scale fisheries (SSF). Regarding the size of the fleet, approximately 13 percent of vessels in the GFCM area of competence were from the Black Sea; SSF made up the overwhelming majority of the Black Sea fleet. Total landings from the Black Sea represented 33 percent of all landings in the Mediterranean and Black Sea, comprising the lowest number of species (6) compared to Mediterranean subregions (22–42). Turkey by far has the highest landings by weight, followed, in order, by Georgia, the Russian Federation, Bulgaria, Romania and Ukraine. The most important species of the Black Sea are Black Sea anchovy (*Engraulis encrasicolus ponticus*) and European sprat (*Sprattus sprattus*), respectively by weight, and Black Sea anchovy fetched the highest value by far. Socio-economic indicators were also analysed and presented in SoMFi 2020 from data submitted to the GFCM by its contracting parties and cooperating non-contracting parties (CPCs); key indicators from the Black Sea indicate that purse seiners and pelagic trawlers generated the highest revenues. However, when it comes to employment, small-scale vessels provided for the majority of employment onboard vessels in absolute terms and full-time equivalent terms, followed by purse seiners and pelagic trawlers. Regarding incidental catch of vulnerable species (seabirds, sea turtles, elasmobranchs and marine mammals) SoMFi indicated that, overall, most vulnerable species caught in the Black Sea were caught by bottom trawlers (data from 2000 to 2020 as available from the literature), whereas in detail, both elasmobranchs and marine mammals were mostly caught by small-scale vessels. The GFCM Secretariat further presented an overview of the status of Black Sea stocks (as reproduced in Appendix 4) as emerging from the 2021 Subregional Group for Stock Assessment in the Black Sea (SGSABS), noting that all eight priority species had been reviewed and assessed in the intersessional period 2019–2021, providing advice for all eight species; of these Black Sea anchovy was assessed through a benchmark session. The GFCM Secretariat underlined the great improvement in the quality and quantity of the data provided towards assessing the status of Black Sea priority species. Quantitative advice was provided European sprat and red mullet (*Mullus barbatus*), remaining advice was qualitative on a precautionary basis. Roadmaps had been drafted for the finalization of the European sprat benchmark, the estimation of reference points for Black Sea turbot and the improvement of horse mackerel data and assessment, while a plan of action was discussed for piked dogfish. The central and critical function of data preparation in the provision of advice on the status of the stocks in the Black Sea was reiterated and terms of reference for data preparation meeting proposed. Work had been done towards the expansion of fishery-independent surveys to cover the distribution of the main commercial species in the Black Sea in a comprehensive way and this was expected to continue. The Stock Assessment Results (STAR) framework to organize GFCM stock assessment results was presented and a plan for future benchmark sessions proposed.

Management of Black Sea fisheries (*GFCM Secretariat*)

The GFCM Secretariat presented information important for the management of Black Sea turbot (*Scophthalmus maximus*) and piked dogfish (*Squalus acanthias*), including issues related to the status of these stocks and important priorities for management discussions, e.g. the management of quotas of

Black Sea turbot and the need for a long-term management plan for piked dogfish. It continued by addressing issues related to the minimum conservation reference size of select species with particular reference to red mullet (*Mullus barbatus*)

Additional advice, **including on the interactions between fisheries and marine ecosystems and environment**

Bycatch and selectivity

Results of Turkish Black Sea Discard Monitoring Programme (Gökçe et al.)

The Turkish discard monitoring programme aims to implement the best possible application of the harmonised discard monitoring methodology developed by the GFCM. The programme was conducted between April 2019 and March 2020 in Turkish demersal trawl fisheries. Here only the findings of the Black Sea monitoring section (GSA 29) are provided. Data collection on discards from the Black Sea demersal trawling fleets was carried out using three different methodologies: on-board observation, self-sampling and questionnaires. The monitoring program was designed in two different fleets: T11 and T12. Thirteen fishing harbours and eleven bottom trawlers were sampled over 125 fishing days. The most abundant landed species were *Merlangius merlangus euxinus* (87 percent), *Mullus barbatus* (8 percent), *Alosaimmaculate* (4 percent), *Trachurus mediterraneus* (0.8 percent) and, *Scophthalmus maximus* (0.4 percent) and discarded species were *Merlangius merlangus euxinus*, *Raja clavata*, *Mullus barbatus*, *Mytilus galloprovincialis and*, *Sprattus sprattus*. The T11 and T12 fleet segment discard ratio was calculated to be 23.8 percent and 30.9 percent respectively in the GSA 29.

Results of the Ukrainian Discards Monitoring Programme (Snigirov S., Chashchyn O., Bushuiev S., Kudriashov S., Finohenov O., Hulak B.)

The discards data on the sprat mid-water trawl fishery and in rapa whelk hauling in Ukrainian part of the Black Sea are not very well known. Therefore, assessment of discard levels on these gear were the main objective in the discard monitoring programme. All on-board observations during 2018–2019 were carried out in accordance with methodologies included in *Monitoring discards in Mediterranean and Black Sea fisheries* (FAO, 2019) within the framework of the Blacksea4Fish project (GFCM). This activity was performed in the Ukrainian part of the Black Sea at first time. Trawlers with a length of 23–28 m used mid-water trawls (the mesh size in the cod was 7–8 mm), and polyvalent vessels 13–18 m long used beam trawls (35–60 mm mesh size). In total 148 on-board observations (i.e. fishing trips – days at sea) were carried out instead of the planned 144 in 2018–2019. In total, 298 hauls using mid-water trawls and 622 hauls using beam-trawls were performed during this period.

According to on-board observations mid-water trawls, which used for sprat fishing, and beam trawls which used for rapa whelk harvesting are characterize by very high selectivity. The bycatch (and accordingly discards) in these types of gear was low in 2018–2019 – 1.46 percent and 0.73 percent of the total catch respectively. Due to the observations sprat and rapa whelk are one of the main target species in Ukraine.

Turbot (*Scophthalmus maximus*), and piked dogfish (*Squalus acanthias*) usually are the main non-target species in bycatch of the sprat fishery. Average bycatch of turbot in mid-water trawl catches in 2018 and in 2019 made up 3.44 kg per tonne and 0.83 kg per tonne of sprat, respectively. Discards (juvenile individuals, standard length less than 35.0 cm) amounted to 0.25 kg per tonne and 0.02 kg per tonne of sprat respectively. Average bycatch of piked dogfish in 2018 and 2019 was 6.62 kg per tonne and 10.18 kg per tonne of sprat respectively. At the same time discard of undersized juvenile individuals (fork length less than 90.0 cm) of piked dogfish was 1.56 kg per tonne and 5.84 kg per tonne of sprat respectively. The bycatch of whiting, red mullet, flounder, bluefish, horse mackerel, anchovy, common stingray, Black Sea shad, etc. was not significant. The most serious bycatch and discards were recorded in the rapa whelk harvesting with the use of beam trawls. Juvenile individuals of turbot and flounder were recorded in most catches of beam trawl. The total number of juvenile turbot individuals in this gear was 646 pieces.

The only negative and the most undesirable issue of the mid-water trawls fishery in the first observations was the sturgeon bycatch. This fish is the most "vulnerable" in the Black Sea. Starry sturgeon (*Acipenser stellatus*), and Russian sturgeon, (*A. gueldenstaedtii*), were present in some hauls. Usually bycatch was 1–2 individuals per fishing trip, and in two cases it reached 6 and 7 individuals of *A. stellatus* per fishing operation. Most often, sturgeons fell into the trawl in May and August. A total of 74 individuals of *A. stellatus* and four individuals of *A. gueldenstaedtii* were caught.

Cetacean bycatch issue in the Black Sea: a major concern for ACCOBAMS (J. Belmont, T. Costin, P. Gol'din, G. Meshkova, M. Paiu, M. Panayotova, D. Popov, K. Vishnyakova)

The problem related to interactions between cetaceans and fishing activities, in particular due to bycatch, are well known to the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS). In order to understand better the nature of these interactions and to find possible mitigation measures that can reduce bycatch events, ACCOBAMS is active in and supports several projects carried out in its agreement area. In the Black Sea, pilot studies on cetacean bycatch monitoring and bycatch mitigation measures were developed recently whose results are presented here.

CeNoBS pilot project: developing monitoring and common methodology for bycatch assessment in the Black Sea.

Incidental catch in fishing gear (bycatch) is a major mortality factor for the Black Sea harbour porpoise. The study during the CeNoBS project in Bulgaria, Romania, Turkey and Ukraine was focused on developing monitoring and common methodology for bycatch assessment in the Black Sea. Data were collected from questionnaire surveys, onboard observations (focused on turbot catches) and examination of stranded carcasses. In 48 percent of interviews cetacean bycatch was reported. Also, bycaught cetaceans (mostly, harbour porpoises) were found in 65 percent of onboard observer missions. The median number of porpoises bycaught per trip was one, and the maximum number was 41; the number of bycaught porpoises per km of the net varied between 0 and 3.66 (the median 0.15). In addition, illegal, unreported and unregulated (IUU) fishing operations were identified as a source of bycatch. The total annual bycatch of harbour porpoises in the Black Sea was estimated at least between 11 826 and 20 000 individuals, at least 4.7 percent of the total population. These results concurred with previous research. Bycatch of the harbour porpoise in the Black Sea exceeds at least threefold established thresholds for sustainable levels and poses a significant threat for this subspecies. The main tasks for the future activities are updating fleet and effort assessments, enhancing the bycatch reporting, mortality analysis, validation of data, elaborating background for time-space closure measures, and, the most important, developing techniques for bycatch mitigation, with consideration of local specific features.

Monitoring of cetaceans' bycatch and testing pingers as mitigation measure in Bulgarian turbot fishery in the Black Sea

In the period 2019–2021 in Bulgaria onboard monitoring was organized to assess bycatch rate of cetaceans in bottom set gillnets for turbot and pingers were tested as mitigation measure. Following devices were used: Future Oceans – 10 kHz, 132 dB NETGUARD; Future Oceans – 70 kHz, 145 dB NETGUARD and Porpoise Alerting Devices (PAL) – 10 kHz, 132 dB by F3: Maritime Technology. In total 340.76 km of nets were monitored during the three years. Those were set at depths from 45 m to 88 m with soaking times from 12 to 31 days. Bycatch numbers were 105 in 2019, 47 in 2020 and 31 in 2021 with 176 of these being harbour porpoises, four bottlenose dolphins and three common dolphins. Significant increase of bycatch from spring to summer was observed. PALs spaced at 140 m have shown 80 percent reduction of bycatch during trials in 2020 and 2021. No significant difference in bycatch rates between active and control nets was observed for tested Future Oceans pingers except in 2021 and when used on shorter (less than 5 000 m) strings of nets.

Outcomes of the WGFiT (GFCM Secretariat)

The GFCM Secretariat gave a summary of the outcomes of the GFCM Working Group on Fishing Technology (WGFiT) held online on 8–9 April 2021, recalling that the meeting reviewed advances in

fishing gear technology to improve the selectivity and rational exploitation of fisheries in the Mediterranean and the Black Sea, particularly with respect to the mitigation of adverse impacts of fisheries on juvenile fish, the mitigation of discards and the mitigation of incidental catch of vulnerable and sensitive species and discussed advances in the development of a Mediterranean and Black Sea catalogue of fishing gear, as well as relevant work on fishing technology and marine litter. In particular, based on the results of past studies, the WGFiT proposed minimum technical specifications to be implemented in bottom trawl nets, namely i) mandatory 40 mm square mesh size in the codend, ii) that the rest of the net has a mesh size greater than 50 mm for diamond-mesh or greater than 40 mm for square-mesh, and iii) a minimum length of the codend (*sensu stricto*) of 2 m. The WGFiT also proposed a pilot project to test mitigation measures for the incidental catch of cetaceans in Black Sea turbot (*Scophthalmus maximus*) fisheries.

Sturgeon

Sturgeon Conservation Action in the Black Sea and Danube Basins - An Overview (Peter Gammeltoft)

The presentation gives an overview of the state of the six Danube sturgeon species of which two may now be extinct while others are classified as critically endangered, evidenced *inter alia* by many missing year classes of young sturgeons. Conservation strategies for these focus on adoption and enforcement of prohibition of fishing in inland waters, restoring and protecting migration routes and habitats in the Danube River basin, and on proposals for establishment and operation of conservation hatcheries, restocking with a view to supporting the highly depleted populations and preventing collapse of remaining stocks supplemented by improved population monitoring.

There is no comparable, joined-up conservation strategy for the marine area thus reducing the overall effectiveness of conservation efforts. While it is known that there is bycatch of anadromous Danube sturgeons in Black Sea, there is an important knowledge gap with respect the size of the bycatch, the pressures from fisheries and other economic activities and lack of knowledge about the marine sturgeon populations. There is a need to fill the important knowledge gap and strengthen data exchange with conservation in inland waters with a view to establishing, implementing, and funding cost-effective conservation across the full geographical range of the sturgeons

Insights on IUU fishing and bycatch of sturgeon in the Lower Danube and adjacent Black Sea (Beate Striebel)

Although sturgeon fishing has been banned in all Black Sea range states, IUU fishing and by-catch remain to threaten the critically endangered sturgeon populations. An EU-funded LIFE project provided evidence of sturgeon trafficking in the Lower Danube region. The report is unique with respect to the application of forensic techniques (isotope and DNA analysis combined) to determine wild specimens in trade, as well as for the regional perspective as it combines data from four countries of the Lower Danube region. Illegally wild caught sturgeon were detected throughout the trade chain in all four countries (Serbia, Bulgaria, Romania and Ukraine). In addition 214 cases of illegal poaching-related incidents recorded by responsible authorities in Romania (82 cases), Bulgaria (82 cases) and Ukraine (50 cases) between January 2016-December 2020 included seizures of illegal fishing gear, seizures of actual sturgeon, transportation of poached sturgeon, and sale of caviar or meat of poached sturgeon. In Bulgaria alone, 594 illegal hook lines were detected, adding up to more than 23.5 km. Overall the report can be considered a first-time evidence on the scale of poaching and illegal trade on a regional level and provides an impression of the devastating impact on populations on the brink to extinction. Regarding by-catch, no systematic information exists in the Danube River nor in the Black Sea. Small pilot activities were started by WWF to assess the problem by engaging fishermen in Bulgaria and volunteers in Ukraine. In line with the Pan European Sturgeon Action Plan, several important conservation actions are needed (1) identify the remaining habitats used by sturgeon in the BS and protect against deterioration. (2) develop a coherent population monitoring (3) establish regular data exchange across the wider BS Basin but the most urgent measure will be to urgently (4) assess and tackle IUU fishing and by-catch in the Black Sea to stop the extinction of sturgeon.

Sturgeon Studies in Turkey (Bilal Akbulut)

In the Central Fisheries Research Institute, studies on producing sturgeon under culture conditions started in the 2000s in order to enhance our natural waters and to improve the aquaculture of these fish in our country.

Broodstock creation and breeding studies are carried out in cooperation with trout farms in Trabzon and Rize provinces. As a result of our studies, brood stocks of four sturgeon species, three of which are natural, have been created. We supplement our natural brood stocks with sturgeon fish caught in the nets of fishermen as bycatch in the Black Sea. After year 2014, we get 20–30 thousand fry from our natural species, Russian sturgeon, and every year regularly. We bring these fish together with their natural environment and with our farmers. In addition, we obtained Siberian fry for the first time in 2020 to present them to fish producers. To date, 12 trout producers have purchased sturgeon juveniles from the Fisheries Central Research Institute to create their own breeding stocks.

Natural species: beluga (*Huso huso*), starry sturgeon (*Acipenser stellatus*), Russian sturgeon (*Acipenser gueldenstaedtii*)

Cultural Origin: Siberian sturgeon (*Acipenser baerii*)

Executed Projects:
- In 2001–2005 (TAGEM) "Investigation of Sturgeon Production Possibilities in the Black Sea Region" project, necessary information was compiled on the necessary subjects such as choosing a suitable place for artificial production of sturgeon, technique of producing fry, rearing in tanks and cages, creating brood stock and improving natural stocks.
- In 2006–2010 (TAGEM), the current status of the stocks and habitats of sturgeon fish were determined in terms of the conservation and breeding of species diversity in our natural waters in the project "Determination of the Current Situation of Sturgeon Populations and Investigation of Breeding Possibilities". Genetic studies have been carried out in susceptible individuals.
- In the years 2011–2014 (TAGEM), the fish taken from the fishermen in the region were kept alive to be used as rootstock candidates after adaptation and feeding acclimatization in the project of "Developing Sturgeon Breeding and Conservation Strategy". Aquaculture studies were carried out using the fish in the breeding stock. Recognition and treatment methods were determined by examining the diseases encountered in the breeding of these fish. Pollution monitoring studies were carried out in Yeşilırmak, one of our rivers, which is the main breeding ground for sturgeons. Fish released from Sakarya, Kızılırmak and Yeşilırmak were followed.
- Within the scope of the "Preliminary Study for the Creation of a Fish Gene Bank: Sperm Conservation" project in 2013–2015 (TAGEM), determination of sperm characteristics and cryopreservation in order to establish a gene bank where sperm are stored in order to protect some fish species that are under the threat of extinction and have economic importance in our country. Cryopreservation techniques have been developed.
- In 2015–2017, the existing breeding stock was strengthened within the scope of the "Brood Stock Management in Sturgeon" project. For the management of the breeding stock, genetic studies were carried out on newly added fish. Sex and sexual maturity of the fish in the breeding stock were examined by ultrasound and probe methods. Reproductive studies were carried out from fish that reached sexual maturity. Studies have been carried out to identify and improve the treatment methods of viral, bacterial and parasitic diseases seen in sturgeon aquaculture.
- In 2019–2023 (TAGEM), the maintenance-feeding and fry production activities of the fish in the breeding stock continue in the "Development of Breeding Techniques in Sturgeon" project. In addition, studies are carried out to determine the quality of larvae and fry to be used in aquaculture and releasing to support natural stocks.
- Russian and starry sturgeon eggs (60 thousand pieces) were brought from Russia within the scope of the project "Improving the Sturgeon Population in Turkey, Habitat Evaluation and Stock Reinforcement" in 2008–2011 (FAO TCP) at the carp production facility in Amasya/Suluova. Hatchlings were produced. Some of the fry obtained were given to trout

farms, research institutions and institutes. Of the broods produced, 4 500 starry sturgeon (*Acipencer stellatus*) and 5 500 Russian sturgeon (*Acipencer gueldenstaedtii*) were released into the Yeşilırmak, Kızılırmak and Sakarya rivers.

- Within the scope of ERA-Net COFASP, in partnership with Romania and Germany in 2015–2018, the project on "Development of Danube (and Black Sea) Sturgeon Stocks for Sustainable Fisheries and Conservation Management" (DASTMAP project), in which sturgeon sampled from the Black Sea and Danube genetic analyses were performed. The first half of the project duration focused on sturgeon sample collection in Romania and Turkey, and on the development of species-specific, appropriate nuclear (microsatellite loci) and mitochondrial (D-loop, cytochrome b, and ND-5/6 sequences) DNA markers.

- In 2011, within the scope of cooperation with the private sector (Papila Trout Farm-Hopa), 1 kg of Siberian sturgeon eggs were procured from Germany, incubated in the institute facilities and the produced fry were delivered to the related farm.

- The project "Investigation of the Aquaculture Potentials of Siberian Sturgeon (*Acipenser baerii*, Brandt 1869) in the Keban Dam Basin" carried out by the Elazig Fisheries Research Institute with the facilities of TAGEM is jointly supported.

- In Turkey, besides our institute, some universities and research institutions carry out studies on sturgeon. We have very good relationship with them and also some of them joined our sturgeon projects.

Other issues

Spatial management (GFCM Secretariat)

The GFCM Secretariat presented the GFCM Database on Sensitive Benthic Habitats: proposal for a data call, recalling the main objective of such tool was to provide scientific advice on the distribution of vulnerable benthic habitats and species in the GFCM area of competence. The Working Group was encouraged to endorse the proposal of official data call to GFCM contracting parties and cooperating non-contracting parties (CPCs) and third parties to feed the database with the best available data from all available sources. The GFCM Secretariat continued by encouraging the Working Group to discuss how to advance the GFCM work on spatial management in the Black Sea, including through the active participation of Black Sea experts in the Working Group on Vulnerable Marine Ecosystems and Essential Fish Habitats (WGVME-EFH) 2022, possibly through a dedicated Black Sea session. To start this discussion, the GFCM Secretariat presented the GFCM database on national fisheries restricted areas (FRAs), encouraging the contribution of Black Sea riparian countries to the GFCM database on national FRAs, giving Bulgaria as an example.

National reports

BULGARIA

Section 1 - Description of fisheries

    A.   **Fishing grounds (GSAs):** 29 - Black Sea

    B.   **Total landings:** 6,228 (2020); 10,269 tonnes (2019); 8,546 tonnes (2018) ; 8,512 tonnes (2017); 8,561 tonnes (2016); 8,735 tonnes (2015); 8,547 tonnes (2014); 9,507 tonnes (2013)

    Main 10 species landed

    C.   **Fleet:** 1,830 vessels (2020); 1,845 vessels (2019); 1,857 vessels (2018); 1,880 vessels (2017); 1,910 vessels (2016); 1,970 vessels (2015)

    Total GT: 5,996 (2020); 6,034 (2019); 6,087 (2018); 6,081 (2017); 6,367 (2016)

    AVG LOA: 6.9 m (2020)

    Min LOA: 2.4 m

    Max LOA: 27.2 m

    AVG LOA previous year: 7.1 m

Section 2 - Status of stocks of priority species

Species/Stock	Ref. year	Stock status	GSA	Presented to GFCM WGs?	Presented to any other forum?
Sprattus sprattus	2020	Uncertain	29	Y-Validated	N
Psetta maxima	2020	In overexploitation with biomass above reference point	29	Y-Validated	N
Engraulis encrasicolus	2020	In overexploitation with relative low biomass	29	Y-Validated	N
Trachurus mediterraneus	2020	Possibly in overexploitation	29	Y-Validated	N
Mullus barbatus	2020	Uncertain with signals of overexploitation	29	Y-Validated	N
Merlangius merlangius	2020	In overexploitation with relative low biomass	29	Y-Validated	N
Squalus acanthias	2020	Depleted	29	Y-Validated	N
Rapana venosa	2020	Around MSY	29	Y-Validated	N

Section 3 - Status of statistics and information system

Executive Agency for Fisheries and Aquaculture, Bulgaria developed and implemented two informational systems to serve the needs of different management and operative levels – Information Statistical System (ISS) and Vessels Monitoring System (VMS). The information-statistics system (ISS) of EAFA Bulgaria has been created in relation to the provisions of the national and European legislation. This system contains information about catches, landings, sales, aquaculture production, take-over declarations, etc. With ISS creation centralized collection and storage of the information have been initiated. The data are in a numerical format which is base for:

-     Check of confidentiality of the input data;
-     Analysis of data and possibility to detect the unconformities;
-     Control on the activities;
-     Data summarize aiming the presentation to the EU and other international and national organizations.

EAFA supports through ISS the following registers:

-     Register of the fishing licenses and authorizations issued;
-     Register of the issued tickets for recreational fishery;
-     Register of the persons, dealing with aquaculture;
-     Fishing fleet register;
-     First sale auctions register;
-     Registered buyers register;
-     Producers register;
-     Fishery permissions for scientific purposes register.

Through VMS the proper monitoring of fishing vessels is ensured. All vessels over 12 m flying under the Bulgarian flag are equipped with a VMS device. Moreover, vessels less than 12 m, targeting turbot are also equipped with devices, allowing their tracking and connected with our FMC.

At the end of 2016, as part of ISS of EAFA, was developed a module for data collection and storage for fishing activity variables, social and economic variables for the fleet. In the module exist the opportunity for processing, providing automated exchange, and providing

electronic reports. The electronic reports generated by the module have been built in accordance with the requirements of the DCF and the variables described in EU MAP.

A. National entities or authorities in charge for the collection of data pertaining the GFCM DCRF Tasks

Task I - Global Figures of National Fisheries	Task II - Catch	Task III - Bycatch	Task IV - Fleet	Task V - Effort	Task VI – Socio-Economic Data	Task VII - Biological Information
Executive Agency for Fisheries and Aquaculture	Executive Agency for Fisheries and Aquaculture	Executive Agency for Fisheries and Aquaculture	Executive Agency for Fisheries and Aquaculture	Executive Agency for Fisheries and Aquaculture	Executive Agency for Fisheries and Aquaculture	Executive Agency for Fisheries and Aquaculture

Section 4 - Status of research in progress (or recently concluded)

Research or Project title	Subject	From	To
Pelagic trawl survey and demersal trawl survey	Stock assessment	2015	2021
Survey for sampling of fishing activities and biological data by observers on board	Marine environment and conservation	2017	2021

Section 5 - Involvement in activities of FAO regional projects

FAO regional project	Year	Type of activity
BlackSea4Fish	2017	Stock assessment, Data collection and statistics, Socio-economics, Marine environment and conservation

Section 6 - Management measures taken in direct response to GFCM decisions

The Fisheries and Aquaculture Act	REC.CM-GFCM/43/2019/3
No national legislation in place. We apply directly the EU legislation in that field.	REC.MCS-GFCM/43/2019/7
No national legislation in place. We apply directly the EU legislation in that field.	REC.MCS-GFCM/43/2019/8

Section 7 - Environment protection measures

Section 8 - Recommendation GFCM/36/2012/2 on mitigation of incidental catches of cetaceans in the GFCM area

Section 9 - Recommendation GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area

Section 10 - Recommendation GFCM/35/2011/4 on the incidental catch of sea turtles in fisheries in the GFCM competence area

Section 11 - Recommendation GFCM/35/2011/3 on reducing incidental catch of seabirds in fisheries in the GFCM Competence Area

Section 12 - Recommendation GFCM/35/2011/5 on fisheries measures for the conservation of the Mediterranean monk seal (*Monachus monachus*) in the GFCM Competence Area

Section 13 - Proposals for future research programmes

Survey at sea for evaluation of biomass of piked dogfish

ROMANIA

Section 1 - Description of fisheries

A. Fishing grounds (GSAs): 29 – Black Sea

B. Total landings (tonnes): 4,462 (2020); 7,149 (2019); 7,445 (2018); 9,553 (2017); 6,839 (2016); 4,825 (2015); 2,231 (2014); 1,712 (2013)

Main 10 species landed

Species	Tons
Rapana venosa	4,116
Mytilus galloprovincialis	117
Engraulis encrasicolus	72
Psetta maxima	70
Alosa spp	37.5
Trachurus mediterraneus	27
Pomatomus saltatrix	15
Mullus barbatus	12
Gobiidae	11.6
Dasyatis pastinaca	5.4
Sprattus sprattus	5
Belone belone	1.7

C. Fleet (number of vessels): 130 (2021); 138 (2020); 167 (2018); 155 (2017) ; 135 (2017); 121 (2016); 127 (2015)

Total kW: 6,071 (2021); 6,151 (2020); 6,109 (2018); 6,104 (2017); 5,366 (2016)

Total GT: 1,541 (2021); 1,503 (2020); 1,402 (2018); 1,377 (2017); 1,009 (2016)

AVG LOA: 9.6 m (2021)

Min LOA: 3.8 m

Max LOA: 26.7 m

AVG LOA previous year: 9.3 m

Section 2 - Status of stocks of priority species

Species/Stock	Ref. year	Stock status	GSA	Presented to GFCM WGs?	Presented to any other forum?
Sprattus sprattus	2020	In sustainable exploitation	29	Y-Validated	Medias Working Group, Black Sea Commission
Psetta maxima	2020	In sustainable exploitation	29	Y-Validated	Medias Working Group, Black Sea Commission

Section 3 - Status of statistics and information system

A. Description of the national system of fishery statistics and/or any improvement/change occurred

B. National entities or authorities in charge for the collection of data pertaining the GFCM DCRF Tasks

Task I - Global Figures of National Fisheries	Task II - Catch	Task III - Bycatch	Task IV - Fleet	Task V - Effort	Task VI – Socio-Economic Data	Task VII - Biological Information
NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta	NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta	NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta	NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta	NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta	NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta	NIMRD - National Institute for Marine Research and Development Grigore Antipa Constanta

Section 4 - Status of research in progress (or recently concluded)

Section 5 - Involvement in activities of FAO regional projects

Activity	FAO regional project	Year	Type
	BlackSea4Fish	2020	Stock assessment, Data collection and statistics, marine environment and conservation

Section 6 - Management measures taken in direct response to GFCM decisions

Section 7 - Environment protection measures

Section 8 - Recommendation GFCM/36/2012/2 on mitigation of incidental catches of cetaceans in the GFCM area

Section 9 - Recommendation GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area

In regards with GFCM regulations the sharks and rays are fished just like complementary species, the catches in 2020 were for shark 0.88 tonnes and for rays 6 tonnes.

Section 10 - Recommendation GFCM/35/2011/4 on the incidental by-catch of sea turtles in fisheries in the GFCM competence area

Section 11 - Recommendation GFCM/35/2011/3 on reducing incidental by-catch of seabirds in fisheries in the GFCM Competence Area

Section 12 - Recommendation GFCM/35/2011/5 on fisheries measures for the conservation of the Mediterranean monk seal (*Monachus monachus*) in the GFCM Competence Area

Section 13 - Proposals for future research programmes