Food and Agriculture Organization of the United Nations

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BlackSea4Fish

Activities and achievements 2022–2023

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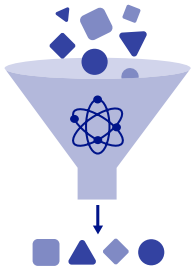
BlackSea4Fish

Activities and achievements
2022–2023

Food and Agriculture Organization of the United Nations
Rome, 2023

Executive summary

This booklet summarizes the achievements and technical activities of the BlackSea4Fish project over 2022–2023.



In 2022 and 2023, the BlackSea4Fish project focused on increasing scientific knowledge to support fisheries management by improving data collection and scientific advice for priority species, including through scientific surveys, enhanced stock assessments and capacity-building activities.

BlackSea4Fish in-person meetings and joint field activities resumed following the COVID-19 pandemic. From the beginning of 2022, in-person activities at the international level gradually restarted.

The BlackSea4Fish project is expected to play a central role in the context of the GFCM 2030 Strategy, addressing the work under each target specific to the Black Sea and contributing to the strategy's objective of consolidating national expertise and scientific capacity to ensure a level playing field across the region.

In this booklet, activities are grouped according to their relevance to the five main outputs of the BlackSea4Fish project.

Over the 2022–2023 biennium, actions pursued by the BlackSea4Fish project included:

1. organizing workshops on age readings and meetings on data preparation, supporting benchmark assessments of priority species, and leading surveys-at-sea (output 1);

2. increasing focus on small-scale and recreational fisheries by engaging rapa whelk fishers in dialogue with researchers to identify potential management measures (output 2);

3. distributing questionnaires to fishers in Bulgaria, Georgia, Romania and Türkiye to assess their perception of illegal, unreported and unregulated fishing (output 3);

4. improving bycatch monitoring (output 4), for which a pilot project to both assess cetacean bycatch in Black Sea turbot gillnet fisheries and test measures to mitigate the incidental catch of cetaceans (CetaByM) was launched in Bulgaria, Georgia, Romania and Türkiye, as well as a research programme on piked dogfish and a pilot project for sturgeon; and

5. launching a number of initiatives to improve technical capacities and disseminate results across the Black Sea (output 5) through the organization of a series of online presentations and workshops, including hands-on sessions related to scientific advice and the management of resources in the Black Sea and the launch of a Black Sea scientific database aimed at improving input data for stock assessment modelling.

Over 2022 and 2023, BlackSea4Fish launched the following **45 activities** to increase regional expertise and technical capacities:

- **3** Data preparation meetings
- **11** Technical meetings
- **4** Technical workshops and trainings
- **3** Scientific surveys-at-sea
- **1** Online presentation series
- **7** Stakeholder meetings
- **3** Selectivity surveys
- **2** Bycatch mitigation trials
- **2** Socioeconomic surveys
- **4** Local ecological knowledge (LEK) surveys
- **3** Awareness-raising campaigns
- **1** Scientific database
- **1** Technical document

Output 1.

Scientific advice in support of fisheries management

Over the 2022–2023 biennium, the BlackSea4Fish project contributed to a number of initiatives aimed at resolving the data gaps and harmonization needs identified by the Subregional Group on Stock Assessment in the Black Sea (SGSABS) towards more accurate stock assessments of Black Sea priority species. This work included coordination of three data preparation meetings (rapa whelk benchmark and Black Sea priority species), fifteen technical meetings, trainings and workshops on turbot, rapa whelk beam trawl surveys, demersal trawl surveys, and age readings. In addition, to meet the need for fishery-independent data for stock assessments, BlackSea4Fish oversaw the execution of three scientific surveys-at-sea.

© GFCM/Tamer Gunal

Testing of the standardized demersal trawl in Trabzon, Türkiye.

Achievement 1. Standardization of demersal trawl surveys in the Black Sea

This survey programme aims to overcome the data gaps and harmonization needs identified by the SGSABS by providing resources for the implementation of the GFCM 2030 strategy towards the sustainability of Mediterranean and Black Sea fisheries. The International bottom trawl surveys in the Black Sea (iBotS) coordinates the fishery independent data collection on four GFCM Black Sea priority species (turbot, piked dogfish, red mullet and whiting).

TECHNICAL ACTIVITY 1. BLACK SEA DEMERSAL TRAWL SURVEY MEETINGS (February 2022–June 2023)

Eight meetings on Black Sea demersal trawl surveys were held with the participation of national experts and supporting experts between February 2022 and June 2023. The meetings were coordinated via online platforms and in person at the international level by the GFCM Secretariat under BlackSea4Fish. Nine survey experts participated in the meetings as national coordinators from Bulgaria, Georgia, Romania, Türkiye and Ukraine.

OBJECTIVES

To understand the methodologies and sampling gears used in existing surveys and to produce a standardized bottom trawl survey manual that can be used by all Black Sea riparian countries.

RESULTS

The protocol of the Mediterranean International Trawl Survey (MEDITS) was adapted to the specificities of the Black Sea, resulting in the iBotS instructional manual, which defined the technical specifications of the survey trawl and gear operation, as well as catch handling and biological sampling procedures for four priority and thirteen additional species.

LINKS

Report of the meeting on the demersal trawl survey

Report of the meeting on the standardization of demersal trawl surveys

TECHNICAL ACTIVITY 2: ONBOARD TRAINING AND GEAR CHECKS
(29 May–2 June 2023, Trabzon, Türkiye)

Survey experts were given a five-day onboard training on gear checks and catch treatment in Trabzon. During these tests, survey experts were provided training on catch handling, biological sampling and gear quality control checks, both on board and in the institute.

OBJECTIVES

To test the performance of the new iBotS sampling gear and estimate its geometrical dimensions, as well as to train experts on catch handling and treatment according to the iBoTS manual. The activity was carried out on board the R/V Sürat Araştırma 1 vessel belonging to the Central Fisheries Research Institute (SUMAE).

LINKS

Report of the onboard training and gear checks

RESULTS

In total, 14 fishing operations were conducted to check gear performance, estimate the dimensions of the gear during the tows and process the resulting catch according to standardized methodologies. Standardized towing speed and haul duration could be determined, as well as estimates of gear performance characteristics related to door spread, vertical opening and wingend spread.

TECHNICAL ACTIVITY 3: THE INTERNATIONAL BOTTOM TRAWL SURVEY IN THE BLACK SEA (iBotS) MANUAL

The iBotS manual evolved out of the Mediterranean area MEDITS protocols manual, adapting to the Black Sea region. While some parts of the MEDITS protocol have been maintained, sections such as sampling gear, gear operation, target species, sampling stations and temporal alignment of the surveys were adjusted to the specific regional needs of the Black Sea. The work was carried out by the Black Sea expert group on demersal trawl surveys under the coordination of BlackSea4Fish. The iBotS group aims to initiate the standardized surveys in autumn 2023 in Türkiye, with plans for potential future roll-out in Georgia, Bulgaria and Romania.

OBJECTIVE

To provide a manual for standardized demersal trawl surveys in the Black Sea.

RESULTS

- The final version of the iBotS manual was produced, ensuring that future survey data will be comparable across the region without conversion factors or complex modelling.
- An expert group of demersal trawl surveys was established under the coordination of BlackSea4Fish, comprising survey experts from five riparian countries (Bulgaria, Georgia, Romania, Türkiye and Ukraine)
- Georgia and Türkiye committed to implementing the new protocol, performing 20 and 60 hauls respectively, while it was decided that Bulgaria and Romania would first engage centrally with the European Union to identify necessary amendments to existing procedures.

LINKS

iBotS manual

A gear check during the onboard training for survey experts in Trabzon. © GFCM/Tamer Gunal

Sorting of rapa whelk individuals during beam trawl survey operations in Romanian Black Sea waters.

Achievement 2. Rapa whelk beam trawl surveys

Initially considered a marine pest, rapa whelk is now exported globally from the Black Sea and brings in multimillion euro revenues for the region.

As the species is currently fished close to or beyond its sustainable limit in the Black Sea, Bulgaria, Georgia, Romania, Türkiye and Ukraine have joined forces to launch a comprehensive standardized scientific survey-at-sea for the species as part of the research programme established through Recommendation GFCM/42/2018/9 on a regional research programme for rapa whelk fisheries in the Black Sea. The programme reflects the challenges of managing non-indigenous species and marks the first step towards sustainable management of this important Black Sea fishery resource. Over 2022–2023, the survey continued in Bulgaria, Romania and Türkiye, with Georgia expected to join in 2023–2024.

TECHNICAL ACTIVITY 1: RAPA WHELK BEAM TRAWL SURVEYS (Spring and autumn 2022, spring 2023)

The Working Group on the Black Sea (WGBS) agreed on the fact that, despite the invasive nature of rapa whelk, its stock in the Black Sea should be exploited within biologically safe limits and managed accordingly. In order to ensure implementation of this decision, the GFCM adopted Recommendation GFCM/42/2018/9 establishing a regional research programme for rapa whelk fisheries in the Black Sea. The aim of the research programme is to improve scientific, technical and socioeconomic knowledge of the fisheries exploiting rapa whelk in a coordinated manner across the Black Sea under the umbrella of BlackSea4Fish.

The first main activity of the research programme was a fisheries-independent scientific beam trawl survey covering the regional distribution of rapa whelk across its exploitation range. Emerging data are crucial for a number of important tasks, above all to inform the stock assessment for this species with respect to its true abundance at sea. Rapa whelk beam trawl surveys began in autumn 2020 (FAO, 2022) and have continued since.

OBJECTIVE

To continue collection of fisheries-independent data to be used for the stock assessment of the species.

RESULTS

- Three beam trawl surveys were performed in Bulgaria, Romania, eastern Türkiye and western Türkiye, with the fourth to be conducted in October 2023 with an additional 20 stations in Georgian waters.
- During each survey, 285 hauls were conducted.
- In total, 855 hauls were carried out over three surveys.
- Data quality was checked by using the RomeBS routine developed ad hoc for this survey.
- Data was analysed using BioIndex routine.

Istanbul University beam trawl survey operation in western Turkish Black Sea waters.
© GFCM/Istanbul University

TECHNICAL ACTIVITY 2: WORKSHOP ON BLACK SEA RAPA WHELK BEAM TRAWL SURVEY RESULTS AND COORDINATION (April 2022, online)

An online workshop was held on 5 April 2022 to discuss the main outcomes of the rapa whelk surveys-at-sea, as well as the major problems encountered during the surveys. In addition, the results of the selectivity studies conducted during the 2021 surveys were presented (FAO, 2022) and the following topics were discussed: i) the application of the selectivity study results to the results obtained in the surveys; ii) the potential need to change the mesh size in future surveys; and iii) other BlackSea4Fish activities on rapa whelk fisheries.

OBJECTIVE

To present the results gathered and challenges faced by the rapa whelk surveys-at-sea.

RESULTS

Selectivity results and their potential application to length–frequency distribution reconstruction were discussed, leading to agreement on the use of a 40 mm cover mesh size for use in future selectivity tests.

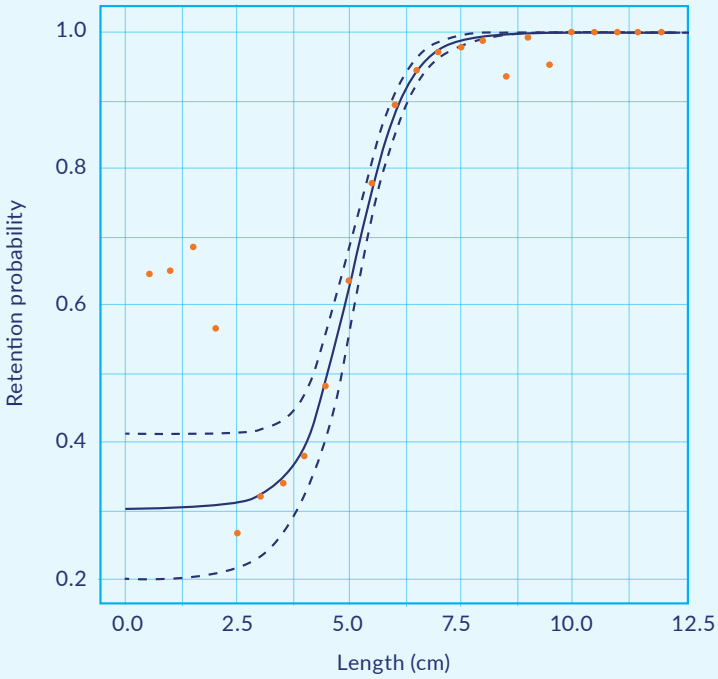
LINKS

Report of the workshop on beam trawl survey results and coordination

TECHNICAL ACTIVITY 3: ESTIMATION OF THE SELECTIVITY OF THE RAPA WHELK SURVEY BEAM TRAWL
(Spring and autumn 2022, spring 2023)

The selectivity of the 72 mm mesh size rapa whelk sampling trawl was tested on a total of 343 hauls over three seasons, during which more than 108 000 individuals were sampled. The results were analysed independently for eastern Türkiye, western Türkiye, Bulgaria, and Romania, as well as for the entire Black Sea. The covered codend method was used, and bootstrapping was applied to estimate confidence limits for the average size selection.

Figure 1. Size selectivity curve of the 72 mm mesh size rapa whelk survey beam trawl



Notes: 95% confidence interval is shown by dashed lines.
The figure shows the combined data obtained from the fourth and fifth selectivity surveys using a 40 mm cover mesh size.

OBJECTIVE

To investigate the selectivity of the beam trawl used for rapa whelk surveys.

LINKS

Beam trawl selectivity results for the third, fourth and fifth periods

RESULTS

- The 40 mm cover mesh size was reported as practical enough to be used in sampling gear for future surveys.
- Retention results were provided for use in the reconstruction of previously obtained length–frequency data in accordance with the 40 mm mesh size.

© GFCM/Timuçin Dinçer

Conducting an interview with fishers in Sile, Türkiye.

Achievement 3.
Socioeconomic surveys

Socioeconomic data are crucial elements to take into consideration when making management decisions for sustainable fisheries. To adequately inform and support future management decisions regarding specific target fisheries, a socioeconomic study was incorporated into both the rapa whelk research programme and the piked dogfish research programme.

TECHNICAL ACTIVITY 1: RAPA WHELK SOCIOECONOMIC STUDY
(2023, Romania, Bulgaria and Türkiye)

A socioeconomic study was carried out in 2023 to capture a snapshot of the economic status of the rapa whelk fishery in the Black Sea during the reference year (2022) as foreseen under Work Package 5 of the GFCM regional research programme for rapa whelk fisheries in the Black Sea. The information collected through the study is foreseen to serve as a baseline for understanding the socioeconomic impacts of potential management measures and to ensure the consideration of economic issues by fishery managers in decision-making.

OBJECTIVES

To establish the socioeconomic dataset for rapa whelk fisheries in the Black Sea countries (Bulgaria, Romania, and Türkiye) and set a baseline against which the socioeconomic impacts of rapa whelk fisheries in the Black Sea can be assessed.

RESULTS

- In Bulgaria, Romania and Türkiye, a total of 296 questionnaires were answered between February and April 2023.
- The evaluation and analysis of the data collected are still underway.

TECHNICAL ACTIVITY 2: PIKED DOGFISH SOCIOECONOMIC STUDY (2023, Romania and Bulgaria)

A socioeconomic study was carried out in 2023 to evaluate the economic status of the piked dogfish fishery in the Black Sea during the reference year (2022) as foreseen under the GFCM research programme on piked dogfish. The information collected through the study is foreseen to serve as a baseline for understanding the socioeconomic impacts of potential management measures and to ensure the consideration of economic issues by fishery managers in decision-making in Bulgaria and Romania.

OBJECTIVES

To establish the socioeconomic dataset for piked dogfish fisheries in relevant Black Sea countries (Bulgaria and Romania) and set a baseline against which the socioeconomic impacts of piked dogfish fisheries fisheries can be assessed.

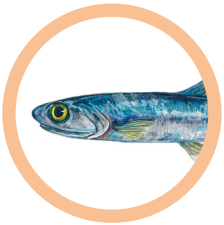
RESULTS

- In Romania and Bulgaria, a total of 43 questionnaires were answered between January and May 2023.
- The evaluation and analysis of the data collected is still underway.

The BlackSea4Fish team meeting with fishers from Shabla, Bulgaria regarding piked dogfish and rapa whelk socioeconomic surveys. © GFCM

Sprat caught in Bulgarian waters
© GFCM/Claudia Amico

Achievement 4. Information for stock assessment of priority species improved



TECHNICAL ACTIVITY 1: TURBOT BIOLOGICAL REFERENCE POINT ESTIMATION WORKSHOP (January 2022, online)

Following a roadmap endorsed by the WGBS in 2021, a workshop on the estimation of turbot biological reference points was held on 13 January 2022. The workshop aimed to provide a capacity-building opportunity for all Black Sea assessment experts in view of the required estimation of reference points needed for the finalization of the 2018–2019 turbot benchmark. A theoretical session reviewing reference point theory and methods for their estimation was followed by a practical hands-on session during which participants ran the relevant scripts with the latest data and model outputs.

OBJECTIVES

To summarize and share the biological reference point estimation process using the stochastic equilibrium reference point software (EQSIM) applied to Black Sea turbot and to understand the underlying assumptions and share a detailed description of the preliminary results.

LINKS

Report of the workshop on turbot biological reference point estimation

TECHNICAL ACTIVITY 2: WORKSHOP TO DISCUSS ASSUMPTIONS NEEDED TO ESTIMATE BLACK SEA TURBOT REFERENCE POINTS (February 2022, online)

Following the workshop carried out on 13 January 2022, an online session was held on 2 February 2022 to investigate, discuss and agree on all relevant assumptions needed before running the final analyses, as required under Step 2 of the roadmap. The decisions made at this meeting were used in the final estimation of the turbot reference points.

OBJECTIVES

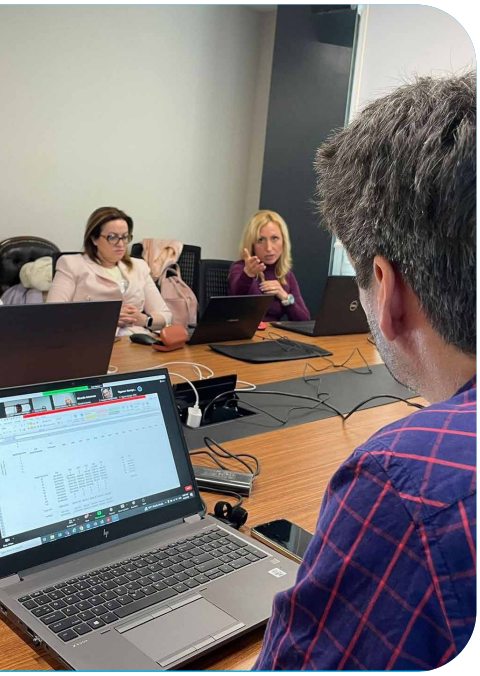
To investigate the assumptions and settle on an appropriate decision for the estimation of the reference points of the Black Sea turbot, in order to finalize the 2018–2019 benchmark session.

RESULTS

It was agreed that B_{MSY} and F_{MSY} reference points would be estimated to formulate scientific advice on the status of the Black sea turbot stock.

LINKS

Report of the workshop on assumptions needed to estimate turbot reference points



Rapa whelk data preparation meeting in Istanbul. © GFCM

TECHNICAL ACTIVITY 3: DATA PREPARATION MEETINGS FOR STOCK ASSESSMENT

Over the biennium, the following data preparation meetings for Black Sea priority species were held to review and discuss issues related to fishery-dependent and fishery-independent data in advance of assessment meetings:

- In advance of the 2022 SGSABS, a meeting on Black Sea priority species was held on 13–17 June 2022 in Burgas, Bulgaria to discuss sprat, horse mackerel, turbot, whiting, red mullet, piked dogfish, Black Sea anchovy and rapa whelk.
- In advance of the 2023 rapa whelk benchmark session, a meeting on 26–27 April 2023 in Istanbul, Türkiye focused on rapa whelk.
- In advance of the 2023 SGSABS, a meeting on Black Sea priority species held on 12–16 June 2023 in Burgas, Bulgaria covered sprat, horse mackerel, turbot, whiting, red mullet, piked dogfish and Black sea anchovy.

Participants in the 2023 Subregional Group on Stock Assessment in the Black Sea data preparation meeting at the congress centre in Burgas, Bulgaria. © GFCM

OBJECTIVES

To prepare and analyse input data towards the stock assessment of GFCM Black Sea priority species and to provide an opportunity to build the capacities of Black Sea experts in assessing stock status.

LINKS

Report of the 2022 SGSABS meeting on Black Sea priority species

Report of the rapa whelk data preparation meeting

Report of the 2023 SGSABS meeting on Black Sea priority species

RESULTS

- Quality checks of the data were performed country by country, and gaps were identified, to be filled before the relevant assessment meetings.
- Where possible, data were analyzed and collated into a final input dataset to be used for the final assessment, and where not possible, roadmaps towards this aim were made in advance of the relevant meeting.
- Rapa whelk catch and effort data, as well as growth parameters, length at maturity and natural mortality were discussed, and agreement was reached on the need for an update and analysis.
- In 2023, the table of stock coordinators and country experts for priority species was updated according to group consensus.
- In 2023, age-reading exercises were suggested for all Black Sea priority species, with workshops already being organized for red mullet, piked dogfish and rapa whelk before the end of the year.

TECHNICAL ACTIVITY 4: WORKSHOP ON AGE READING OF BLACK SEA ANCHOVY AND SPRAT
(February 2023, Trabzon, Türkiye)

Workshops on the age reading of Black Sea anchovy and sprat were held on 13–16 February 2023 at SUMAE in Trabzon, Türkiye. Experts working on anchovy and sprat in different regions of the Black Sea (Bulgaria, Georgia, Romania and Türkiye) jointly evaluated sets of otoliths. The main challenges and issues faced when reading the otoliths were discussed, as well as a common methodology for the age determination of anchovy and sprat populations.

OBJECTIVE

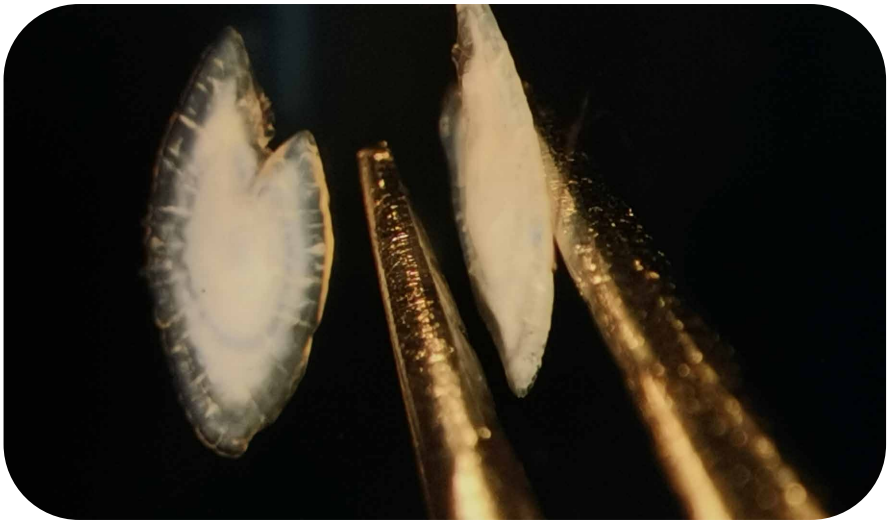
To improve the consistency of the age-reading data of anchovy and sprat towards more accurate stock assessment modelling.

LINKS

Report of the workshop on anchovy and sprat age reading

RESULTS

- It was agreed that age reading workshops should be repeated regularly (every one or two years) prior to data preparation meetings.
- Otoliths used for age determination should be stored under the appropriate conditions to create an otolith archive allowing for future re-evaluation, as well as retrospective monitoring of ecological changes in the Black Sea, such as those due to climate change.
- An otolith archive should be foreseen under a single and central structure fostering ease of use, access, sharing and information exchange. A Black Sea otolith centre/ laboratory established under the name of GFCM would be useful, for which the infrastructure exists at SUMAE in Trabzon, Türkiye.
- The issue of false rings was found to require greater attention and further work.
- A standardized age reading protocol is needed for Sprat, including the determination of reference ages.



Anchovy otoliths.
© Gizem Akkus (right)

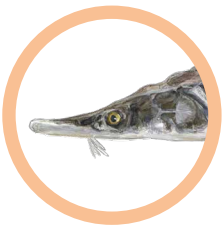
Sprat age reading session.
© George Tiganov (opposite)

© George Tiganov


© GFCM/BS4F project

Sturgeon found in Ukrainian waters.

Achievement 5. Pilot project on sturgeons



Resolution GFCM/44/2021/5 on the mitigation of fisheries impacts for the conservation of sturgeons in the Black Sea (geographical subarea 29) establishes the need for a pilot project under the framework of the BlackSea4Fish project, consisting of three work packages (WPs).

Work Package 1 aims at creating a network of scientific experts and raising awareness on the conservation status and critical issues related to the marine part of the sturgeon life cycle, while the objective of WP 2 is to collate all information available on species biology, distribution and interactions with marine fisheries in consultation with national authorities and the network of scientific experts created in WP 1.

Finally, WP 3 will cover an integrated analysis of all the information gathered under WPs 1 and 2 towards identifying potential management and technical measures for the marine part of the sturgeon life cycle.

TECHNICAL ACTIVITY 1: HARNESSING BLACK SEA FISHERS' LOCAL ECOLOGICAL KNOWLEDGE OF STURGEONS (January 2023, Bulgaria, Georgia, Romania, Türkiye)

Integrating fisher experience into science-based knowledge through questionnaires plays an important role in informing actions towards rebuilding marine resources. Local ecological knowledge was requested on three main categories of information: seasonality, distribution, and illegal, unreported and unregulated (IUU) activities.

Interviewing Turkish fishers to learn from their experience of sturgeons. © SUMAE/Salih Ilhan

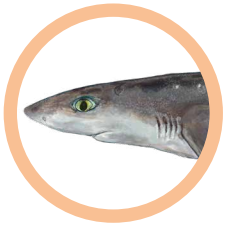
OBJECTIVE

To gather complementary information from fishers on issues such as bycatch, distribution, seasonality, and perceived IUU.

RESULTS

- In total, 302 questionnaires were conducted through semi-structured interviews with local fishers in four Black Sea countries.
- The fishing gear with the highest rates of sturgeon bycatch was demersal trawls for Bulgarian and Turkish fishers and set gillnets for Georgian and Romanian fishers.
- In Bulgaria and Georgia, most of the respondents stated that bycatch interaction occurs during all seasons. On the other hand, winter was the main season reported by the participants from Romania and Türkiye.
- Average depth and distance from the shore were dependent on both season and gear.

Piked dogfish entangled in Turkish waters. © Sinop University/Süleyman Özdemir



Achievement 6. Research programme on piked dogfish

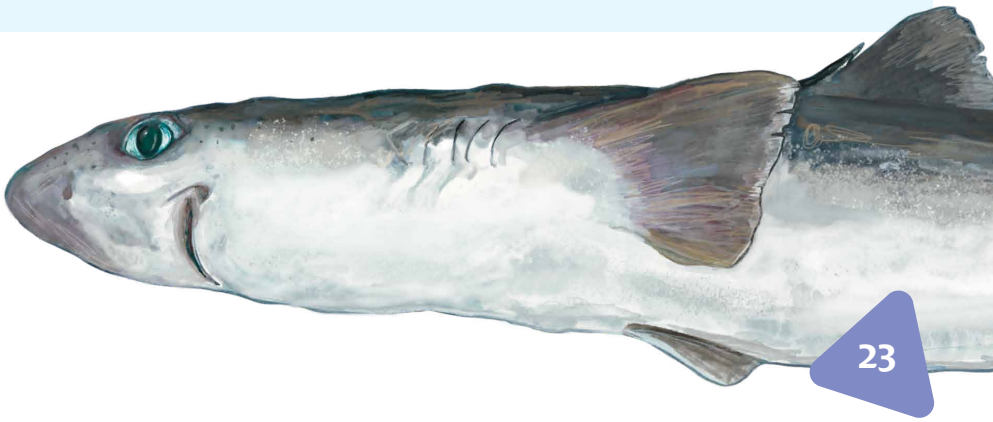
In 2015, the GFCM adopted Recommendation GFCM/39/2015/4 on management measures for piked dogfish in the Black Sea, in line with the precautionary approach for Black Sea fisheries exploiting piked dogfish and/or capturing it as significant bycatch.

This recommendation also requests contracting parties and cooperating non-contracting parties to engage in capacity-building efforts and other research cooperative activities to improve knowledge on piked dogfish. The active involvement of fishers, whose knowledge of dogfish can provide a valuable resource, is urgently needed towards fulfilling the requirement for a participatory approach to fisheries management set in Recommendation GFCM/44/2021/10, which establishes a research programme on piked dogfish in the basin.

In this context, an awareness-raising campaign was expected to cover the requirements of the research programme through targeted actions addressing the specific needs of the different work packages. A socioeconomic survey of the sector, including on trade, markets and the development of economic indicators, as well as on external aspects affecting the fishery and the economic sustainability of related fishing gear, was also planned under the research programme (Achievement 3).

TECHNICAL ACTIVITY 1: HARNESSING BLACK SEA FISHERS' LOCAL ECOLOGICAL KNOWLEDGE OF PIKED DOGFISH (January –June 2023, Bulgaria, Georgia, Romania, Türkiye)

In total, 292 questionnaires were conducted through semi-structured interviews with local fishers in four Black Sea countries. The questionnaire consisted of three main blocks of information on piked dogfish: bycatch interaction, at-vessel mortality and historical changes in population.



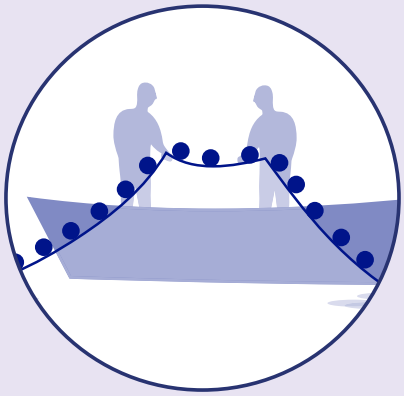
OBJECTIVE

To gather key information from fishers on bycatch, distribution, seasonality and release mortality in order to provide insight into how interactions between piked dogfish and the Black Sea fishery have changed over time.

RESULTS

- The demersal trawl was identified as the fishing gear mainly responsible for piked dogfish bycatch, followed by set gillnets.
- Winter is the most prominent season for bycatch in Turkish Black Sea waters, while interactions are considered to mostly occur throughout the year in the other countries.
- For demersal trawls, all respondents stated that piked dogfish was captured alive.
- According to the results, piked dogfish caught using set gillnets were less likely to survive after being released than individuals caught using other types of fishing gear.
- Most Turkish and Georgian fishers stated that the population started to decline in the 1990s. In Bulgarian and Romanian waters, where targeted piked dogfish fisheries are still present, the majority of fishers think that the status of the population has remained stable or increased since the 1990s.

Interviewing a Turkish fisher about piked dogfish.
© GFCM/Emre Fakıoğlu



Output 2.

Improved knowledge of small-scale and recreational fisheries

Small-scale fisheries play an important role in providing income and ensuring food security, particularly to economically vulnerable coastal communities. Therefore, over 2022–2023 the BlackSea4Fish team organized a series of meetings with small-scale fishers in Bulgaria, Romania and Türkiye with regards to the rapa whelk fishery.

© GFCM/Claudia Amico

TECHNICAL ACTIVITY 1: RAPA WHELK SMALL-SCALE FISHERIES IN-COUNTRY MEETINGS (March 2022, Trabzon, Türkiye; April 2022, Constanta, Romania; April 2022, Varna, Bulgaria; online, May 2022)

BlackSea4Fish organized a series of meetings related to rapa whelk fisheries in Bulgaria, Romania and Türkiye. The meetings were held in local languages and organized with the support and active participation of the Institute of Fish Resources in Varna, Bulgaria, the National Institute for Marine Research and Development (NIMRD) in Constanta, Romania and the Central Fisheries Research Institute (SUMAE) in Trabzon, Türkiye. A wide group of stakeholders participated in these discussions, including rapa fishers using diving methods, fishers using beam trawls, experts participating in the GFCM rapa surveys, people in the processing industry, inspectors from fishery control agencies, and others.

OBJECTIVE

To launch the process of identifying management measures through stakeholder engagement within the framework of the research programme on rapa whelk fisheries in the Black Sea, with a view to providing additional knowledge towards the identification of potential management measures relevant to a multiannual management plan.

RESULTS

- Contradicting views on restrictions were often expressed by different stakeholders.
- Fishers generally expressed the opinion that regulations based on scientific studies would be acceptable, but they requested more legislative flexibility.

TECHNICAL ACTIVITY 2: RAPA WHELK STAKEHOLDER MEETINGS – CONNECTING FISHERS AND SCIENTISTS IN THE PROCESS OF THE RAPA WHELK RESEARCH PROGRAMME (April 2023, Istanbul, Türkiye; June 2023, Shabla, Bulgaria; August 2023, Constanta, Romania)

The information meetings titled “Connecting fishers and scientists in the process of the rapa whelk research programme” were organized in the framework of the Small-Scale Fishers Forum and the GFCM Research programme on rapa whelk on 28 April 2023 in Istanbul, Türkiye, 22 June in Shabla, Bulgaria and 24 August in Constanta, Romania. Stakeholders including divers, beam trawl fishers, ministry representatives, fisher cooperatives, non-governmental organizations and members of the GFCM Secretariat attended. The meetings focused on the initial outcomes of the socioeconomic study conducted as part of the research programme, with a view to collecting fisher feedback on study outcomes and on emerging scientific advice. Participants presented their priorities, challenges and future perspectives for the rapa whelk sector in local languages.

OBJECTIVES

To further improve and inform interactions between researchers and rapa whelk fishers in the Black Sea through continued dialogue on rapa whelk management and monitoring and to promote knowledge-sharing through the discussion of recent developments and study results.

RESULTS

- Given the reduced competitiveness of selective gear compared to beam trawlers, there is a need to adopt tailored management measures (differentiated management system) to rapa whelk divers, also providing the possibility for financial stimuli and support.
- The stakeholder information-sharing approach undertaken for rapa whelk fisheries should be extended to other demersal fisheries, with a view to increasing their sustainability.
- Socioeconomic studies should be undertaken for the other priority species of small-scale fisheries in the Black Sea.

BlackSea4Fish Project coordinator Hüseyin Özbilgin presenting the GFCM to participants in Istanbul.
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Rapa whelk stakeholder meeting in Shabla, Bulgaria. © GFCM/Yordanka Radusheva (top); © GFCM/ Hüseyin Özbilgin (bottom)

Output 3.

Assessment of illegal, unreported and unregulated fishing and operationalization of a modular approach to vessel monitoring systems

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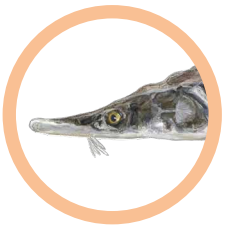

Achievement 1. Pilot project on sturgeons

Fisher knowledge can be useful for addressing cases of non-compliance in sturgeon fisheries in order to effectively explore future actions to tackle illegal, unreported and unregulated (IUU) fishing.

To this end, based on the advice of the Working Group on the Black Sea (WGBS), the forty-fourth GFCM annual session adopted Resolution GFCM/44/2021/5 establishing a pilot project on the marine part of the sturgeon life cycle, to be conducted under the framework of the BlackSea4Fish project with the aim of reverting the critical status of sturgeon stocks.

The pilot project was conceived as a collaboration between all relevant partners in line with conservation needs at the national, regional and international levels, according to a set of general terms of reference.

TECHNICAL ACTIVITY 1: HARNESSING BLACK SEA FISHERS' LOCAL ECOLOGICAL KNOWLEDGE OF ILLEGAL, UNREPORTED AND UNREGULATED ACTIVITIES RELATED TO STURGEONS
(January–June 2023, Bulgaria, Georgia, Romania, Türkiye)

During this activity, 302 fishers were interviewed to better understand fisher perceptions of illegal sturgeon activities in four riparian countries (Bulgaria, Georgia, Romania, Türkiye). This part of the questionnaire aimed to collect information on key components of illegal activities, such as most responsible fishing gear types, high season, root causes and frequency of illegal events, and on efficiency in monitoring, control and surveillance mechanisms from the fishers' point of view.

OBJECTIVES

To better understand and evaluate fisher perceptions of illegal, unreported and unregulated fishing (IUU) activities related to sturgeons.

RESULTS

- Among all respondents, 42 percent of fishers had retained sturgeon at least once when encountered in their catch and 1.6 percent stated that there are fishers who are primarily targeting sturgeon in their areas.
- Based on fisher responses, the set gillnet was the fishing gear most involved in IUU activities, followed by the demersal trawl and hook and line.
- Most of the respondents stated that illegal sturgeon activities never occurred in their area. However, the options "rarely" and "sometimes" were among the answers with significant rates in Georgia and Romania, respectively.
- More than 25 percent of the respondents were not satisfied with the current monitoring, control and surveillance mechanism in Romania and Türkiye.

Output 4.

Improved monitoring of discards and bycatch of vulnerable species

Over 2022–2023, BlackSea4Fish worked to improve knowledge and test measures to mitigate the bycatch of vulnerable species. Two pilot projects were launched for cetaceans and sturgeons, along with a research programme on piked dogfish. Following the recommendations made by countries during the 2021 Working Group for the Black Sea (WGBS), the BlackSea4Fish team helped to coordinate activities on bycatch and took part in field work.

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Achievement 1. Pilot project to assess cetacean bycatch in Black Sea turbot gillnet fisheries and to test measures to mitigate the incidental catch of cetaceans (CetaByM)

The need for a pilot project to assess cetacean bycatch in Black Sea turbot gillnet fisheries and to test measures to mitigate the incidental catch of cetaceans had been noted by the WGBS.

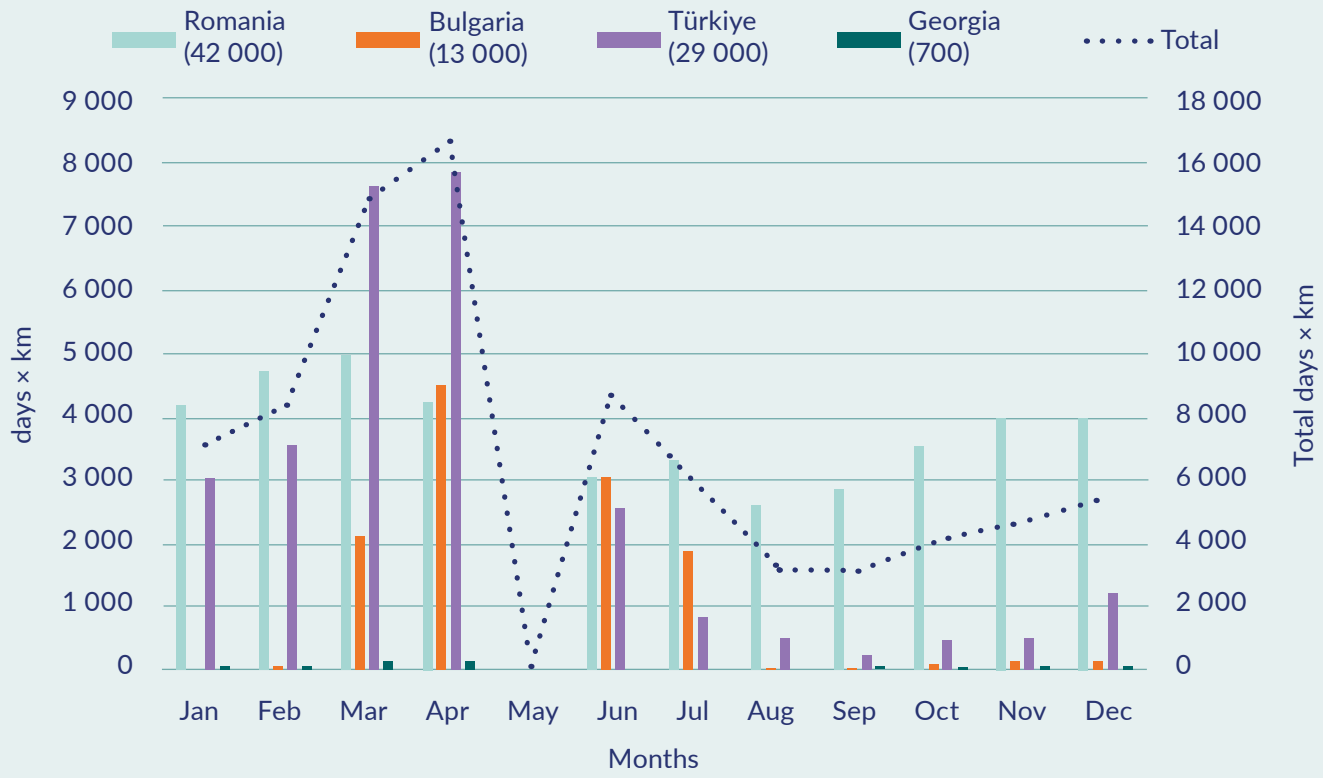
The relevant work began during the summer of 2022 under the coordination of BlackSea4Fish in Bulgaria, Georgia, Romania and Türkiye. The efforts of this project will provide a wider and deeper overview of the state of the Black Sea turbot gillnet fishery and its interactions with cetaceans and will provide field-tested solutions for mitigating the bycatch of cetaceans in the Black Sea.

A special thematic session on turbot fisheries was organized during the International Symposium on Fisheries and Aquatic Sciences (SOFAS 2023) in Trabzon, Türkiye on 24-26 October 2023, during which the following results and more were presented.

TECHNICAL ACTIVITY 1: ESTIMATION OF THE SPATIAL AND TEMPORAL DISTRIBUTION OF ACTIVE FISHING EFFORT

This work was conducted through in-person meetings with fishers in the Bulgarian, Georgian, Romanian and Turkish ports where turbot gillnet fishers are officially recorded and/or from which they are known to operate. If and where necessary, the work continued via phone and email communications. A questionnaire prepared for this purpose was filled out by a fisher from each vessel. Fishers were asked the lengths of their actively used nets and the number of days these nets were used in each month over the reference year 2022. Cooperating fishers were also asked for the times and locations of cetacean bycatch in order to determine hotspots of this phenomenon.

Figure 2. Monthly fishing effort across Black Sea countries



Note: Numbers in parentheses under country names represent each country's total annual fishing effort in days × km.

OBJECTIVES

To collect active fishing effort data for the Black Sea turbot gillnet fishery.

RESULTS

- Active fishing effort, in terms of days × km, was shown to be significantly higher in Romania than in Bulgaria and Türkiye despite the fact that Romania has fewer vessels.
- Active fishing effort in Bulgaria and Türkiye was temporally concentrated just before and after the seasonal closure of the fishery, which runs from 15 April to 15 June.
- Active fishing effort in Georgian waters was significantly lower than in the other three countries.
- Many fishers expressed that violations of seasonal closures are common.
- Many fishers were hesitant to reveal real gear size information over fears of further limitations, despite the fact that the names of fishing vessels were not asked.
- Using vessel numbers as a measure of fishing effort is misleading.

TECHNICAL ACTIVITY 2: COMMERCIAL TESTS OF PORPOISE ALERTING DEVICES

Sea trials were carried out in Bulgaria, Romania and three locations in Türkiye (western, central and eastern) over the spring and summer of 2023 under commercial conditions. Some of the turbot gillnets were equipped with wide-band porpoise alerting devices (PALs) designed to prevent harbour porpoises (*Phocoena phocoena*) from being bycaught. The latest version of the device imitates the natural warning sounds of harbour porpoises at a frequency range of 10–130 kHz and source level of >145 dB. These signals cause the animals to be more alert and intensifies their echo sounding, enabling them to detect nets in time and avoid them. The collected biological data covers the number and total weight of cetaceans, turbot, piked dogfish and thornback rays as separate landed and discarded portions.

OBJECTIVES

To test the efficiency of PAL devices and collect biological information under commercial fishing conditions.

RESULTS

- Bycatch was highest in Bulgaria and PALs appeared to be most efficient at deterring cetacean bycatch in the same country, but results should be taken with caution as 10 of the 13 dolphins bycaught came from the same haul. In central Türkiye, PALs also showed some promise.
- The overall number of dolphins bycaught was low, preventing the performance of proper statistical analyses.
- Romania recorded the highest number of turbot landed in the trials and was also among the countries or areas with the lowest dolphin bycatch.

Table 1. Summary of porpoise alerting device trials conducted in Black Sea countries

Country/area	Effort		Turbot catch landed (kg)		*Phocoena phocoena* bycatch (number of individuals)	
	number of trials	days × km	Control	PAL	Control	PAL
Romania	5	503	410	529	1	0
Bulgaria	9	748	185	219	13	1
Western Türkiye	3	76	46	45	0	2
Central Türkiye	17	203	87	88	8	3
Eastern Türkiye	6	44	-	-	0	0
Total	**40**	**1574**	**728**	**881**	**22**	**6**

Porpoise alerting device.
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TECHNICAL ACTIVITY 3: EXPERIMENTAL TESTS OF MITIGATION MEASURES AND COMPARISONS OF SOAK TIME

This work compares the landed and discarded portions of the catch in one control and four test nets over a duration of 12 months in Romanian waters. The tests started in April 2023 and will continue until the end of March 2024.

OBJECTIVES

To test different types of nets and PAL devices and compare landed and discarded portions of the catch.

RESULTS

Results will be analyzed when the trials are completed in March 2024.

A harbour porpoise entangled during sea trials.
© GFCM/Hüseyin Özbilgin

A juvenile thornback ray bycaught in the Black Sea.
© GFCM/Emre Fakıoğlu

TECHNICAL ACTIVITY 4: DISCARD MONITORING PROGRAMME

With the aim of improving knowledge on bycatch rates in the Black Sea, field work was conducted in Turkish waters through the GFCM discards monitoring programme, collecting data on board and at landing sites in line with the standards outlined in the handbook *Monitoring discards in Mediterranean and Black Sea fisheries: Methodology for data collection* (FAO, 2019).

Table 2. Discard ratios of the Turkish Black Sea fishing fleet observed during the discards monitoring programme

Vessel group	Length class (length overall)	Discard ratio (%)
Set gillnets	6–12 m	18.73
Trawlers	12–24 m	30.38
Trawlers	> 24 m	32.42
Paired mid-water trawlers	12–24 m	0.03
Paired mid-water trawlers	> 24 m	0.04

OBJECTIVES

To systematically collect discard information and calculate discard rates for various fishing gear types and fleet segments, providing valuable information on the amount of discards associated with different fishing practices.

RESULTS

- Comprehensive data on catch composition (landed and discarded fractions) from bottom trawlers, purse seiners, mid-water trawls and turbot gillnet fisheries were systematically gathered through onboard observations.
- Information pertaining to the incidental capture of vulnerable species, including sex and vitality conditions, was collected, serving as a foundation for the development of effective mitigation strategies and solutions.

Output 5.

Cooperation, outreach and well-disseminated results

Several initiatives were launched to improve regional expertise in stock assessments models and in response to the need to scale up technical capacities in the Black Sea, a requirement often underlined by the Working Group on the Black Sea (WGBS). A series of online trainings and presentations were organized, and a scientific database for the Black Sea was launched.

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Fishers reading through leaflets in Düzce, Türkiye.

Achievement 1. Awareness-raising activities under different projects

Participatory activities were carried out under the BlackSea4Fish project in combination with other activities within the context of the CetaByM pilot project, the sturgeon pilot project and piked dogfish research programme.

Several field visits were made by the BlackSea4Fish team to lead awareness-raising activities, such as information-sharing meetings, distributing printed material containing information on related activities, and other project actions.

Field visits were conducted in Bulgaria and western Türkiye by the BlackSea4Fish team, in Georgia by the National Environment Agency, in Romania by National Institute for Marine Research and Development (NIMRD), and in central and eastern Türkiye by the Central Fisheries Research Institute (SUMAE).

Leaflets and posters were created for this activity in local languages and distributed to the fishers together with branded materials.

Stakeholder meeting in Sakarya, Türkiye.
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Covers of awareness-raising leaflets on bycatch distributed by the BlackSea4Fish team to fishers.

TECHNICAL ACTIVITY 1: BLACK SEA SCIENTIFIC DATABASE (July 2023)

A scientific database of experts, publications and stock assessment input data (including life history and biological information) on Black Sea priority species has been repeatedly requested by the WGBS, with the aim of guaranteeing the quality of stock assessment input data. BlackSea4Fish has sought to create an interactive database that experts can access and update. Work on constructing this database has been finalized, and it now offers a resource to experts in important related fields and for disseminating Black Sea scientific work to a wider audience. The database is expected to improve the quality and quantity of information and give experts ownership over the process, possibly leading them to more actively keep it up to date.

OBJECTIVE

To launch the Black Sea scientific database containing information on the biology of priority species, experts working in the Black Sea region and published fisheries literature.

RESULTS

- The experts who gave their consent to participate in the database totaled 104.
- A literature review was performed, and 713 publications related to Black Sea fisheries were listed.

Initial data are included on the life history parameters of Black Sea priority species (e.g. size, growth and maturity). In the future, these data will be expanded to contain all stock assessment input data.

LINKS

Black Sea scientific database dashboard

TECHNICAL ACTIVITY 2: SEMINAR ON STURGEONS IN THE BLACK SEA (March 2023, online)

The online seminar marked the first activity of the pilot project on sturgeons in the Black Sea, taking the initial steps towards establishing a network of scientific experts on marine-oriented sturgeon conservation.

OBJECTIVE

To create a network of scientific experts to address the critical issues related to the marine part of the sturgeon life cycle.

LINKS

Online technical presentations on sturgeons

GFCM webnews on sturgeon pilot project

RESULTS

- Seventy-one sturgeon experts from ten countries convened to address the critical issues associated with the marine part of the sturgeon life cycle.
- Seven experts shared their findings from the Black Sea and Europe.
- Bycatch interactions and illegal fishing activities, considered to pose significant threats to the marine life cycle of sturgeons, were the key topics of the seminar.

TECHNICAL ACTIVITY 3: RAPA WHELK RESEARCH PROGRAMME MEETING

On 25 April 2023, a hybrid meeting was held to disseminate the rapa whelk research programme results. Activities such as rapa whelk beam trawl surveys, rapa whelk age-reading practices, rapa whelk fishery regulations in different Black Sea countries, and socioeconomic survey studies were presented. The meeting was held in English at Istanbul University, Türkiye and online.

OBJECTIVE

To inform stakeholders about rapa research programme activities.

LINKS

Report of the rapa whelk research programme meeting

RESULTS

- Stakeholders expressed their gratitude for future management measures based on research programme results.
- Stakeholders requested more meetings in local languages so that fishers could also express their opinions.


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

FAO. 2022. *BlackSea4Fish - Activities and achievements: 2020–2021*. Rome. https://doi.org/10.4060/cc2735en

This booklet presents the activities and achievements of the BlackSea4Fish project over the 2022–2023 biennium. Established in 2016 and implemented by the General Fisheries Commission for the Mediterranean, the BlackSea4Fish project contributes to the sustainable management of Black Sea fisheries by providing scientific and technical support to the countries in the region.

From the beginning of 2022, BlackSea4Fish in-person meetings and joint field activities were able to gradually resume following the COVID-19 pandemic. The project focused on increasing scientific knowledge to support fisheries management by improving data collection and scientific advice for priority species through scientific surveys, enhanced stock assessments and capacity building. A total of 45 activities were launched over 2022 and 2023, including three data preparation meetings, eleven technical meetings and seven stakeholder meetings.

BlackSea 4Fish

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