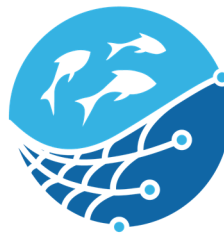EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR MARITIME AFFAIRS AND FISHERIES

Directorate C: Fisheries Policy Atlantic, North Sea, Baltic and Outermost Regions
Unit C3: Scientific Advice and Data Collection

Call MARE/2020/08

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Streamlining the establishment of regional work plans in the Mediterranean and Black Sea

STREAMLINE

European Maritime and Fisheries Fund (EMFF)

Final Report

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FINAL PUBLISHABLE SUMMARY REPORT

The STREAMLINE grant ("Streamlining the establishment of regional work plans in the Mediterranean and Black Sea") was aimed at supporting the operation and functioning of the Regional Coordination Group for the Mediterranean and Black Sea (RCG Med&BS), helping the RCG Med&BS to advance beyond national approaches, and achieve the expected results of coordinated regional work for the fisheries data collection.

Fourteen partners from the ten EU Member States in the Mediterranean and Black Sea, and from the main Institutes/Departments/Agencies involved in the EU DCF have cooperated in STREAMLINE. Twelve out of the fourteen institutions in the project Consortium came from the experience of the previous grants MARE/2014/19 Med&BS and STREAM (MARE/2016/22), and most of the WP/Task Leaders working in the project played a key role in those projects. In addition, the Fisheries Research Institute (FRI) in Kavala (Greece) contributed and provided a proactive support to all the activities performed in STREAMLINE. Ms Ivana Vukov, Head of Unit for Data Collection Programme in Fisheries at the Croatian Ministry of Agriculture (Directorate of Fisheries), and former Chair of the RCG Med&BS, participated as an observer, providing her contribution and support to the action.

The main objective of STREAMLINE was to draft Regional Work Plans (RWPs) for the Mediterranean and Black Sea through a co-creative work process with the RCG Med&BS and Member States.
To this end, the project activities have been structured in 5 Work Packages (WPs), interlinked each other. Each of the WPs included specific activities to achieve the required objectives, had a person in charge (working in cooperation with a co-chair), a core team who carried out the majority of the work, a clear set of milestones and deliverables, and a work plan.

Work Package 0 "Project management and coordination, communication and dissemination of the project results" was the work package for the project coordination, management, communication and dissemination of project results. WP0 has been ensuring a smooth running of all the project activities throughout the 24 months of implementation (from December 2020 to December 2022), and the successful accomplishment of the project goals.
The progress of the activities has been monitored by the project Coordinator supported by the Steering Committee (SC) composed by the persons in charge of each WP.
The objective of coordination was also the monitoring of all the activities for ensuring the project outputs according to the project time schedule and decision taken as well as ensuring a smooth and timely communication among the partners involved in the different Member States (MSs), as well as with the RCG Med&BS and DG MARE.
The STREAMLINE website (https://www.streamlineproject.eu/) and the project sharepoint (Microsoft 365 platform: https://streamline2021project.sharepoint.com/sites/STREAMLINE/) were developed in the very first phases of the project implementation under WP0. In addition to these tools, a Microsoft Teams group was created to further facilitate the communication and document sharing among partners. Microsoft Teams was used for the organization of project meetings, and it was then decided to implement it as an additional sharepoint. This tool was extensively used for the organization of the workshops and meetings performed under WP2 (Task 2.1 and Task 2.2) and WP3 in November and December 2021.
In addition, these tools represented an important support for the coordination of the project and liaison with project partners and the RCG Med&BS (e.g., organization of brief meetings to discuss specific issues, involving WP and Task core teams, RCG Chairs, etc.) especially in the light of the restrictions to travelling due to the Covid-19 pandemic.

WP0 has been ensuring STREAMLINE proactively cooperated with all the other regional grants funded under the Call MARE/2020/08, namely RDBFIS, FISHN'CO and SECWEB, as well as with the RCGs

Secretariat. The STREAMLINE coordinator participated to the FISHN'CO workshop (Vigo, 18-20 October 2022). The participation to the FISHN'CO workshop represented a good opportunity to further strengthen the cooperation between the two grants, and align the objectives and outcomes.

STREAMLINE has fruitfully cooperated with the RCG Med&BS during its full implementation. STREAMLINE and the RCG Med&BS co-organized two Joint Workshops, in line with the Recommendations 3 and 4 of the RCG Med&BS 2021. The Joint Workshop on recreational fisheries met online on the 27th April 2022 (Zoom platform), with the support of the RCGs Secretariat. The meeting was attended by 33 experts from the ten EU Member States of the Mediterranean and Black Seas (see List of participants), and two representatives of the Commission (DG MARE). The Workshop achieved to draft a proposal for a non-binding regional work plan (RWP) on recreational fisheries (RFs) in the Mediterranean and Black Sea.

The Joint Workshop on data needed to assess the impact of fisheries on the marine ecosystem was held on the 28th April 2022, and was attended by 40 national experts from the ten Med&BS EU Member States (MS), the chair of the RCG Med&BS, Jurgen Mifsud (MAFA-DFA, Malta), and four representatives of the EU Commission (DG MARE and DG ENV). The group met virtually on a Zoom platform kindly provided by the RCGs Secretariat. The Workshop agreed on a roadmap to draft proposals for non-binding regional work plans (RWP) on the monitoring of the incidental bycatch of vulnerable species and on fish stomach contents collection and analysis in the Mediterranean and Black Sea.

The Joint Workshop was preceded by two workshops organized by STREAMLINE. The workshop on PET bycatch monitoring took place on the 14th December 2021 (online), and was attended by 40 experts from the ten EU Member States of the Mediterranean and Black Sea, plus a representative of DG MARE (see Annex III – List of participants). The Workshop was chaired by Paolo Carpentieri (NISEA, Italy), Task 2.2 Leader, in cooperation with Alessandro Ligas (CIBM, Italy), STREAMLINE Coordinator. The Workshop on the stomach content data collection and analysis organized under the Task 2.2 of the STREAMLINE project met online on the 31st January 2022, and was attended by 54 experts from the ten EU Member States of the Mediterranean and Black Sea.

STREAMLINE proactively participated to the RCG Med&BS annual meetings in 2021 and 2022, stimulating the drafting of relevant recommendations and proposing actions to be taken to progress towards a regional approach, as well as in other specific RCG Med&BS workshops (e.g., recreational fisheries 08-09/03/2021 and follow-up 09/04/2021, and bycatch 14/07/2021).

In addition, STREAMLINE was presented and discussed during the RCG Large Pelagics annual meeting (15-17/06/2022). During the meeting, a discussion on a possible RWP on the monitoring of the incidental PETs bycatch in drifting longlines fishery took place.

STREAMLINE participated to the National Correspondents, RCGs Chairs and Liaison meetings in 2021 and 2022, informing DG MARE, end-users, NCs and RCG Chairs on the progressing of the activities and results achieved, and supporting the RCG Med&BS Chairs.

Finally, two STREAMLINE – RCG Med&BS joint meetings were organized online (Teams platform) in the final phases of the grant implementation (21st November and 21st December 2022) to discuss the outcomes of the grant activities, the comments received by STECF regarding the draft non-binding RWP for 2023, and draft the roadmap for a smooth handover of responsibilities and tasks between the grant and the RCG Med&BS (and relevant Intersessional sub-groups, ISSGs).

Work Package 1 "Compiling Information and identifying gaps" performed an exhaustive review of the elements that already exist to be fed into regional work plans, with the aim of possibly identifying the gaps and barriers that hampered so far the implementation of regional approaches.

WP1 took into consideration the following sources of information:
- deliverables and outcomes of the previous grants has been implemented with particular attention to the methodological aspects developed under the different actions. These concerned regional sampling plans for commercial fisheries, including small scale, as well as for stomach contents data collection, for the monitoring of incidental catches of vulnerable species and for recreational fisheries;

- in consultation with DG MARE, the outcomes of the pilot studies implemented in the different Mediterranean and Black Sea MSs were analysed;
- relevant documentation of scientific nature pertaining to STECF, GFCM, ICES and reports of the RCG for the Mediterranean and the Black Sea has been scrutinised and the elements related to the establishment of regional sampling schemes have been retained.

In addition, a questionnaire has been addressed to relevant stakeholders and scientists involved in the Fisheries Data Collection to help establishing a "map" of what exists, what are the best elements and approaches already developed, which barriers have been identified that could prevent the development of regional work plans and what additional information is still necessary to be able to develop regional sampling plans.

Further to the analysis of the elements above and their discussion with the RCG Med&BS, a number of conclusions have been set, and associated actions have been proposed as follows:

General
- End users involvement and RCG increasing responsibility have considerably contributed to the process aiming at the establishment of Regional Sampling Plans (RSPs).
- Despite progress achieved there are elements to be refined before RSPs could be implemented

Commercial fisheries
- According to the majority of the Med&BS MSs, there is potential to develop RSPs for commercial fisheries at least at the sub-regional level and for shared stocks, given that the data required for their implementation are already regularly collected for most métiers and species/stocks. In this regard, future regional coordination shall rely upon common data formats and standardized codes.
- Two types of barriers for the implementation of these RSPs are identified: methodological and administrative/political/financial. The RCG Med&BS has a crucial role to play to overcome such barriers.

Fish stomach content collection and analysis
- In spite that most MSs consider as appropriate the protocols developed under the MARE/2014/19 Med&BS and STREAM grants, according to the RCG Med&BS, they are not fully implemented so far, with some exceptions. The RCG meeting held in 2020 established 2021 as target date for the adoption of these protocols in all MSs.
- There is no agreement among MSs on the choice of species and the amount of specimens to analyse, as proposed by the STREAM project, as well as the proposed number of stomachs to be collected.
- The above aspects, as well as the training element, appear as limiting factor for the implementation of RSPs on stomach content analysis in the short term. Training sessions regarding the harmonization of methods and optimization of the existing protocols, discussions on the outcomes and methodology of the achieved pilot projects, as well as the development of guidelines for prey taxonomic identification are proposed by the concerned MSs.

Incidental PETs bycatch
- The analysis of the outcomes of the pilot projects reveals that a notable progress has been achieved in the monitoring of the relevant métiers as agreed by the RCG (otter bottom trawl, long lines and set nets for the Mediterranean; beam trawl Rapana fishery and turbot gillnets for the Black Sea).
- Almost all Mediterranean and Black Sea pilot studies referred to the FAO-GFCM methodology "Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection".
- In parallel, the métiers proposed in the framework of the STREAM project (bottom trawlers in the Western Mediterranean and in the Adriatic and beam trawl Rapana fishery in the Black Sea)

appear as appropriate candidates for start implementing RSPs, although the suggested number of fishing days to be covered are considered excessive by most MSs. It seems necessary establishing a balance between minimum and optimal requirements in terms of trips or fishing days.

- As for other data collection activities, collecting the relevant data for the monitoring of incidental catches of vulnerable and/or non-target species requires the presence of observers on board. Observers are considered the most reliable and useful means of collecting such data. However, this is not always an easy task, due to mistrust of the ship owners or for space limitations, and for security/safety reasons.

- It seems therefore that other alternative approaches (e.g. self-sampling, interview etc.) should be used. Self-sampling is based on fishers completing logbooks while at sea. This methodology could involve the fishermen in the monitoring activities and in the identification of species and handling (whenever possible) before release. Interviews also can be of great use in gathering quantitative information if the correct methodology is used. Combine different methodologies seems the best approach to achieve a high-enough percentage of coverage.

Recreational fisheries
- For the whole Mediterranean and Black Sea Regions, data on recreational fisheries are sparse and difficult to obtain in a reliable way, as the license and information systems are not homogeneous. Several pilot studies have been implemented in most of the MSs with different approaches, intensity, coverage and reliability of results. Despite the progress achieved in previous grants, it is commonly assumed that further work is needed at national and regional level.

- In general, the estimation of the "population" of recreational fishers is considered important, through national wide probabilistic surveys (e.g., telephone surveys) and also the on-site validation of catches and biological parameters, since self-reporting has a lot of problems regarding misidentification of species or estimating lengths or weights.

- The establishment of a list of priority species based on regional specificities is a priority. In this regard, work developed in the framework of GFCM and RCG Med&BS should form the basis for establishing such a list.

Based on the above conclusions and with the aim to address the identified barriers and needs for the implementation of Regional Sampling Plans in the Mediterranean, a number of actions are proposed as follows:

Commercial fisheries
- Organisation of online Workshops on optimisation of sampling effort
- Exploring the possibility to hold online workshops on growth and maturity
- Organisation of a decision-making meeting concerning agreements for RSP
- Definition of sampling units:
- Resume the work of the PGMed
- Consultation at sub-regional level

Fish stomach content collection and analysis
- Follow up of the implementation of the STREAM protocols by RCG (Meeting 2021)
- Discussion on the adequacy of the number of stomachs to be analysed as proposed by STREAM
- Discussion on the choice of species for study in the Mediterranean and Black Sea
- Organisation of online Workshop on prey identification

Incidental PETs bycatch
- Organisation of a training workshop on PETS identification covering all categories of PETS (marine mammals, sea birds, sharks and rays, reptiles).

- Discussion on the minimum and optimal levels of coverage for observers
- Exploring alternative approaches involving fishermen

Recreational Fisheries
- MS to ensure that their national methodology is in line with methodologies prescribed in the GFCM handbook on recreational fisheries starting from 2022
- RCG to plan further work to review list of species and discuss methodologies and type of data to be collected

The results of the review performed under WP1 were presented and discussed during a joint workshop between STREAMLINE and the RCG Med&BS on the 14th June 2021. The meeting was attended by 30 experts, including the RCG Med&BS Chairs and the coordinator of FISHN'CO, and a representative of DG MARE. In addition, the results of WP1 were presented during the 2021 Liaison Meeting (23-24 September 2021).

Based on the existing information and the gaps identified in WP1, WP2 "Filling information gaps" was aimed at producing the insights necessary to design regional work plans for the Mediterranean and Black Sea. WP2 was organized in three Tasks:
- Task 2.1: Sampling design optimization in all the metiers, including SSF, and identification of sampling hierarchy;
- Task 2.2: Collection, processing and analysis of stomach contents and monitoring of incidental by catch;
- Task 2.3: Recreational fisheries.

Task 2.1 has been focusing on the sampling design optimization in the metiers relevant in the study areas, including SSF.
This task has been aimed at:
- The generalization of the SDTool and BioSimTool originally developed in the STREAM project (Ligas, 2019). In particular, an upgrade of the SDTool was carried out to allow to take into account a different number of positive trips for each species included in the case study. Moreover, additional quality indicators, focusing on the variability of the corresponding relevant estimates (e.g. von Bertalanffy parameters, size at first maturity, modes, anti-modes, amplitude ratio) have been included in BioSim Tool.
- Application of SDTool and BioSim Tool to the four selected case studies to provide a set simulations on alternative sampling design scenarios widely discussed with the experts of the study areas to support the drafting of the Regional Work Plans for the Mediterranean and Black Sea.

Task 2.1 launched a Data Call (Milestone M2.1) on the 22nd June 2021 with a deadline for receiving the data fixed on the 23rd July 2021.
A Data Sharing Agreement (DSA; please see Annex VII to this report) was drafted to facilitate the provision of data by all the Member States (MSs) in the Mediterranean and Black Sea, necessary for fulfilling the objectives of the Task 2.1 of the STREAMLINE project. The DSA has been finalized following its circulation and approval by the National Correspondents (NCs) of the Mediterranean and Black Sea MSs.
For the implementation of Task 2.1 of STREAMLINE, the following data were requested for the period 2014-2020:

a. Landings data of certain stocks by fishing activity category European lvl 6 (métier), quarter, GSA and country.

b. Biological data for certain stocks by métier, sampling trip/event, at trip or haul level.

c. Fishing activity data related to sampling fishing trips with available biological data.

Data on landings, biological and fishing activity data were requested based on the RCG Med&BS 2018 Optional Data Call format, included in the 2017 RCG Med&BS report. This format is a simplified form of SDEF (Standard Data Exchange Format).
The requested data were received from all the Mediterranean and Black Sea EU MSs.

Under STREAMLINE Task 2.1, a training workshop on sampling design optimization R tools met online from the 29th November to the 1st December 2021, and was attended by 36 experts from nine EU Member States of the Mediterranean and Black Sea. The Workshop was chaired by Isabella Bitetto (COISPA, Italy), Task 2.1 Leader, in cooperation with Alessandro Ligas (CIBM, Italy), STREAMLINE Coordinator.
The training activity started with a presentation by Ms Bitetto providing an overview of the sampling optimization tools with a description of the new features foreseen under STREAMLINE project. The main objective of this training was to allow the experts to familiarize with the tools utilizing a dummy dataset. To facilitate the use of the scripts and avoid conflict problems due to the use of the *knitr* package, the SDTool scripts have been extracted from the .Rmd.
SD Tool was implemented for the first time within MARE/2014/19 Med&BS project and further improved within STREAM project (MARE/2016/22). This tool allows, through bootstrap technique, to resample the historical data studying the Coefficient of Variation (CV), the raised LFDs and the Earth Mover Distance (EMD) for different stratifications (spatial, temporal, and technical) in association with the number of primary sampling units (i.e. trips) for a set of species.
The SD Tool v.2 includes options allowing a flexible definition of the sampling scheme. The optimization can be carried out on:
- different technical stratifications, introducing options to define the technical strata on the basis of gear (level 4) and/or metier, grouping strata with similar characteristics;
- different temporal aggregations, in order to make flexible the stratification by quarter and/or semester, depending on fisheries and target species specifications;
- different spatial aggregations, grouping data of stocks considered shared among MSs in order to get results on the whole area of the stock (not only by GSA).

The statistical principle behind the SDTool is represented by the CV decreasing curve, when increasing the number of sampling units. This curve is, firstly, interpolated and, secondly, the part of the curve where the tangent changes and begins to flatten (i.e. the curvature range) is considered as a suitable trade-off between the precision and the sampling effort. Then, the sample size (in term of sampling units) corresponding to that part of the curve is proposed as "optimal" sample size.
BioSim Tool was implemented for the first time within STREAM project (MARE 2016/22), taking advantage of the work carried out by ICES WKBIOPTIM. This tool allows, through bootstrap technique as well, to resample the historical data studying the Coefficient of Variation (CV) and the Earth Mover Distance (EMD) and to derive possible sub-samples to be applied on length measurements. Moreover, an optimal number of individuals to be sampled for sex, maturity and age (the latter stratified by length class) by species can be derived.
The new developments foreseen under STREAMLINE projects are mainly represented by the implementation of additional quality indicators to the ones developed and tested in STREAM taking into account the work carried out in the ICES WKBIOPTIM3 and the work by Wischnewski et al. (2020). The new indicators are:
- Admissible dissimilarity Value (ADV), as a measure of sampling reliability based on the comparison of the modes, anti-modes and amplitude of the LFDs under different sampling scenarios;
- Mean length-at-age, mean age-at-length, parameters of the von Bertalanffy growth model, maturity ogive parameters, root mean squared prediction error (RMSPE), mean squared prediction error (MSPE) and the mean average percentage error (MAPE), to evaluate the

variability of the relevant estimates (e.g. von Bertalanffy parameters, size at first maturity) under different scenarios and to identify a satisfactory sub-sampling strategy.

The technical requirements are:
- R version 3.6.3, due to the use of COST packages;
- libraries: Fishpifct, COSTcore, COSTdbe, COSTeda and data.table.

A detailed presentation of each step needed to run the scripts implemented in **SDTool** was made:

1. *Data preparation*: transformation of the data from the RCG format to the COST objects (CS and CL, for the SDTool) and to the SDEF tables (CA, HH, HL, SL, TR, CL) (for BioSim Tool); this step is carried out through the two scripts: Conversion from RCG CS to CS cost object and Conversion from RCG CL to CL cost object.
2. *InvestigateData* script: it provides information on the temporal, spatial and technical coverage of the dataset.
3. *RunOptimizationBYspecies* script: it allows to find the optimal range in terms of number of trips for each defined stratum on the basis of the density kernel function.
4. *RunScenario* and *RunEvaluation* scripts: allow to simulate different sampling designs and to evaluate the impact on precision and on LFDs respect to the baseline.

Similarly, a detailed presentation of each script implemented in **BioSimTool** was made:

1. *Data preparation*: transformation of the CA and HH SDEF tables in the format required by BioSim in Rdata format.
2. B_data_simulation_LENGTH script: it allows to derive an optimal number of length measurements for each defined stratum without significantly losing in precision (e.g.CV);
3. B2_calculate_subsample script: allows to estimate a subsample factor to be used in the *RunScenario*script of SDTool, to simulate scenarios involving the sub-sampling;
4. C_data_simulation_MATURITY: allows to derive an optimal number of maturity data to be collected without significantly losing in precision (e.g. ogive CV);
5. D_data_simulation_SEX-RATIO: allows to derive an optimal number of sex data to be collected without significantly losing in precision (e.g. sex ratio CV);
6. E_data_simulation_AGE: allows to derive an optimal number of age data per length class to be collected without significantly losing in precision (e.g. ALK CV).

After the presentation of each script, specific sessions were dedicated to the individual work on the codes; during these sessions clarifications were asked by the participants and the answers were given in plenary. Moreover, some results of the individual exercises (e. g. different sampling scenarios results) were shown by the participants to the whole group and the interpretation of them were discussed and clarified.

An overview of the a priori quality check script, developed in STREAM under WP6, to verify the consistency of the detailed data, was also provided by Ms IB. These quality checks should be carried out before starting to work on the case studies.

A plenary discussion took place on the identification of the case studies to be implemented under STREAMLINE and to be presented to the RCG Med&BS as possible regional work plans on commercial fisheries (including SSFs) in the Mediterranean and Black Seas.

Taking into consideration the experience gained in the previous grants, and criteria such as the relevance of the stocks/fisheries, data availability and enforcement of multi-annual management plans, the following case studies were identified:

Case Study n.	GSAs	Countries	Stocks	Fisheries

1	29	Bulgaria, Romania	*Sprattus sprattus, Scophthalmus maximus*	PTM, GNS
2	1-2-5-6-7	Spain, France	*Aristeus antennatus, Merluccius merluccius, Parapenaeus longirostris*	OTB_DES, OTB_MDD, OTB_DWS, LLS, GNS
3	17-18	Croatia, Italy, Slovenia	*Merluccius merluccius, Mullus barbatus, Nephrops norvegicus, Parapenaeus longirostris, Solea solea*	OTB_DES, FPO, TBB, GNS, GTR, LLS
4	17-18	Croatia, Italy, Slovenia	*Engraulis encrasicolus, Sardina pilchardus*	PTM, PS

This list was provided to the RCG Med&BS for their consideration and final approval.

The analyses for the four case studies were performed by national experts with the support of Task 2.1 leader, Isabella Bitetto. The work was done both offline and through the organization of online workshops and meetings in the period March-August 2022.

In general, two scenarios alternative to the baseline/status quo were tested. These scenarios were based on the optimal range in terms of number of trips to be monitored. In some cases, a third alternative scenario was tested, based on a reduced number of individuals to be measured during each monitored trip (sub-sampling factor).

The optimal sampling size was calculated through the 05_runOptimizationBYspecies.Rmd script from the SD Tool. The analysis was based on the calculation of the CV associated to the raised LFDs of a given species per year and per métier. As an example, the case of turbot in GSA 29 is shown in the figure below; the CVs versus the number of trips are shown, and the vertical blue lines are referred to the first 4 local maxima of the density kernel function, used to derive the optimal sampling size range based on the historical sampling data and expert knowledge. The results are showing that turbot in GSA 29 has been under-sampled in all the years considered in the analyses.

Scophthalmus maximus BGR-1-GNS_DEF - CV vs no. of trips
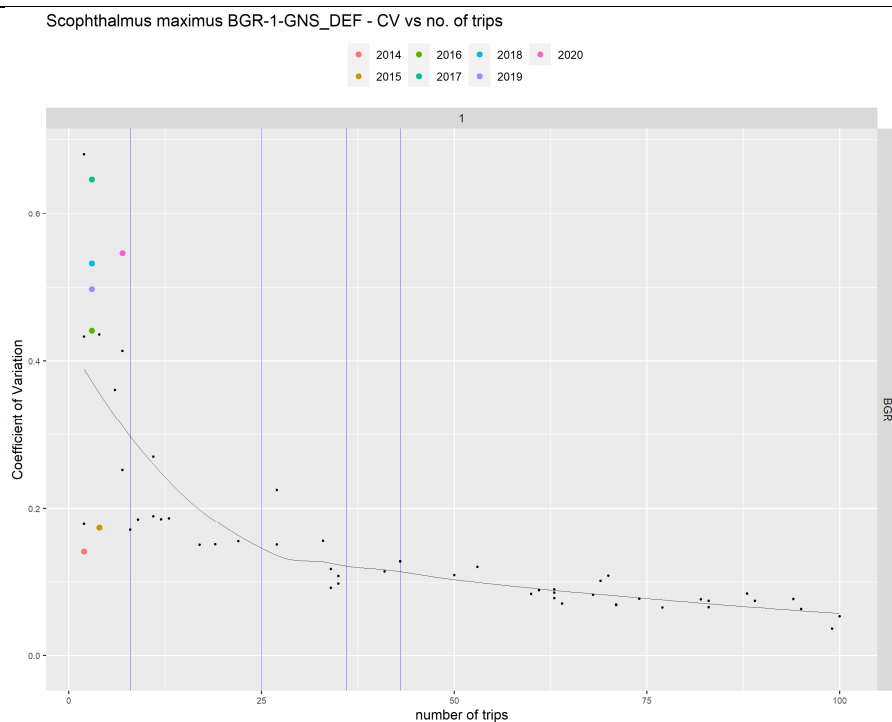
In contrast, deep-water rose shrimp in GSA 6 is an example of a stock that has been over-sampled in the years considered for the analysis (please see the figure below).

Parapenaeus longirostris GSA6-1-OTB_DEF - CV vs no. of trips
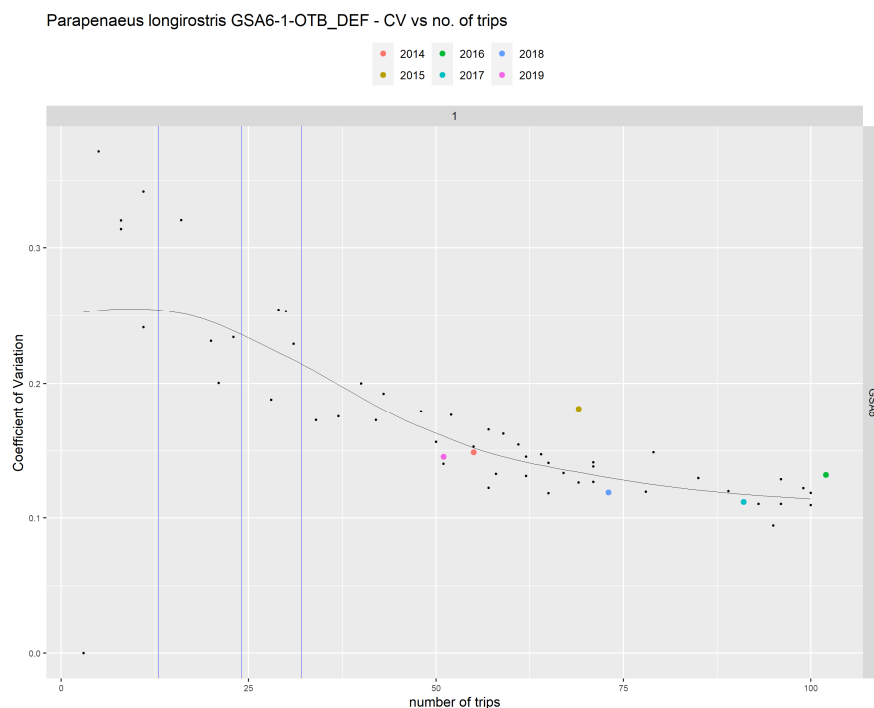
Therefore depending on the initial scenario (baseline), the optimal range could represent an increase or a decrease of sampling effort (e.g., number of monitored trips) if a certain stock under- or over-

sampled, respectively. This is associated to a decrease or a decrease in CV associated to the optimal range scenarios.

The results of the four case studies were presented and discussed during the RCG Med&BS 2022 annual meeting (6-9 September 2022). Those results have to be considered as preliminary. So far, no general agreement was achieved in all the case studies at the RCG Med&BS and MSs level on which scenario should be considered for future work plan implementation. However, the RCG Med&BS and MSs agreed that the results produced by STREAMLINE Task 2.1 may represent a robust basis for the further work that will be performed in the future by the incoming ISSG on Sampling Optimization (Scientific Network) to better refine the analyses and propose future sampling plans based on an optimized sampling strategy.

CASE STUDY 1, BLACK SEA (GSA 29)

Species	Country	Métier	Scenario	CV	n. of trips	measured specimens
Scophthalmus maximus	BGR	GNS_DEF	Baseline	28.9	8	444
Scophthalmus maximus	BGR	GNS_DEF	Scenario 1	22.7	12	794
Scophthalmus maximus	BGR	GNS_DEF	Scenario 2	18.3	20	1255
Scophthalmus maximus	BGR	GNS_DEF	Scenario 2 + subsampling	42.9	20	712
Scophthalmus maximus	ROU	GNS_DEF	Baseline	21.1	8	1249
Scophthalmus maximus	ROU	GNS_DEF	Scenario 1	19.5	9	1399
Scophthalmus maximus	ROU	GNS_DEF	Scenario 2	18	10	1527
Scophthalmus maximus	ROU	GNS_DEF	Scenario 2 + subsampling	20.7	10	742
Sprattus sprattus	BGR	OTM_MPD	Baseline	26.9	10	3096
Sprattus sprattus	BGR	OTM_MPD	Scenario 1	24.8	12	3961
Sprattus sprattus	BGR	OTM_MPD	Scenario 2	21.9	16	5224
Sprattus sprattus	BGR	OTM_MPD	Scenario 2 + subsampling	34.4	16	2517
Sprattus sprattus	ROU	FPN_LPF	Baseline	13.4	11	22600
Sprattus sprattus	ROU	FPN_LPF	Scenario 1	11.7	13	26217
Sprattus sprattus	ROU	FPN_LPF	Scenario 2	11.4	15	31344
Sprattus sprattus	ROU	FPN_LPF	Scenario 2 + subsampling	11.4	15	15268
Sprattus sprattus	ROU	OTM_MPD	Baseline	17.6	14	5438
Sprattus sprattus	ROU	OTM_MPD	Scenario 1	17.5	16	5745
Sprattus sprattus	ROU	OTM_MPD	Scenario 2	14.7	20	7604
Sprattus sprattus	ROU	OTM_MPD	Scenario 2 + subsampling	14.6	20	3870

CASE STUDY 2, WESTERN MEDITERRANEAN (GSAs 1, 2, 5, 6, 7)

SPAIN

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens
Aristeus antennatus	GSA 1	OTB_DWS	Baseline	12.8	24	4949
Aristeus antennatus	GSA 1	OTB_DWS	Scenario 1	12.2	27	5574

Aristeus antennatus	GSA 1	OTB_DWS	Scenario 2	14.0	30	3167
Merluccius merluccius	GSA 1	OTB_DEF	Baseline	74.1	96	5060
Merluccius merluccius	GSA 1	OTB_DEF	Scenario 1	82.7	47	2541
Merluccius merluccius	GSA 1	OTB_DEF	Scenario 2	89.6	69	2149
Merluccius merluccius	GSA 1	OTB_DWS	Baseline	58.6	24	148
Merluccius merluccius	GSA 1	OTB_DWS	Scenario 1	55.1	27	170
Merluccius merluccius	GSA 1	OTB_DWS	Scenario 2	55.9	30	192
Mullus barbatus	GSA 1	OTB_DEF	Baseline	18.1	96	5885
Mullus barbatus	GSA 1	OTB_DEF	Scenario 1	24.1	47	2881
Mullus barbatus	GSA 1	OTB_DEF	Scenario 2	43.5	69	2398
Nephrops norvegicus	GSA 1	OTB_DEF	Baseline	23.0	96	4173
Nephrops norvegicus	GSA 1	OTB_DEF	Scenario 1	30.0	47	2048
Nephrops norvegicus	GSA 1	OTB_DEF	Scenario 2	37.0	69	1960
Parapenaeus longirostris	GSA 1	OTB_DEF	Baseline	25.3	96	11141
Parapenaeus longirostris	GSA 1	OTB_DEF	Scenario 1	29.0	47	5515
Parapenaeus longirostris	GSA 1	OTB_DEF	Scenario 2	61.1	69	3976
Aristeus antennatus	GSA 2	OTB_DWS	Baseline	13.6	18	5449
Aristeus antennatus	GSA 2	OTB_DWS	Scenario 1	14.5	16	4613
Aristeus antennatus	GSA 2	OTB_DWS	Scenario 2	27.0	19	2749

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens
Merluccius merluccius	GSA 5	OTB_DEF	Baseline	55.8	20	599
Merluccius merluccius	GSA 5	OTB_DEF	Scenario 1	65.9	13	359
Merluccius merluccius	GSA 5	OTB_DEF	Scenario 2	62.2	24	602
Mullus barbatus	GSA 5	OTB_DEF	Baseline	26.7	9	178
Mullus barbatus	GSA 5	OTB_DEF	Scenario 1	28.1	6	132
Mullus barbatus	GSA 5	OTB_DEF	Scenario 2	51.1	11	194
Nephrops norvegicus	GSA 5	OTB_DEF	Baseline	20.5	32	5690
Nephrops norvegicus	GSA 5	OTB_DEF	Scenario 1	23.7	21	3916
Nephrops norvegicus	GSA 5	OTB_DEF	Scenario 2	47.6	39	3778
Parapenaeus longirostris	GSA 5	OTB_DEF	Baseline	30.1	9	1464
Parapenaeus longirostris	GSA 5	OTB_DEF	Scenario 1	33.6	6	1010
Parapenaeus longirostris	GSA 5	OTB_DEF	Scenario 2	68.7	11	924
Aristeus antennatus	GSA 5	OTB_DWS	Baseline	15.2	12	5151
Aristeus antennatus	GSA 5	OTB_DWS	Scenario 1	11.2	24	10369
Aristeus antennatus	GSA 5	OTB_DWS	Scenario 2	23.0	31	6790
Merluccius merluccius	GSA 5	OTB_DWS	Baseline	73.5	11	133
Merluccius merluccius	GSA 5	OTB_DWS	Scenario 1	61.5	22	255
Merluccius merluccius	GSA 5	OTB_DWS	Scenario 2	55.9	28	339
Aristeus antennatus	GSA 5	OTB_MDD	Baseline	17.7	12	4457
Aristeus antennatus	GSA 5	OTB_MDD	Scenario 1	14.0	20	7341
Aristeus antennatus	GSA 5	OTB_MDD	Scenario 2	15.0	37	6823
Merluccius merluccius	GSA 5	OTB_MDD	Baseline	37.5	12	770
Merluccius merluccius	GSA 5	OTB_MDD	Scenario 1	45.7	20	1551
Merluccius merluccius	GSA 5	OTB_MDD	Scenario 2	67.3	37	1463

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens
Merluccius merluccius	GSA 6	GNS_DEF	Baseline	18.9	28	1452
Merluccius merluccius	GSA 6	GNS_DEF	Scenario 1	17.6	32	1639
Merluccius merluccius	GSA 6	GNS_DEF	Scenario 2	25.9	37	1381
Merluccius merluccius	GSA 6	LLS_DEF	Baseline	78.5	26	818
Merluccius merluccius	GSA 6	LLS_DEF	Scenario 1	77.0	34	1089
Merluccius merluccius	GSA 6	LLS_DEF	Scenario 2	73.7	47	1129
Merluccius merluccius	GSA 6	OTB_DEF	Baseline	57.7	84	6194
Merluccius merluccius	GSA 6	OTB_DEF	Scenario 1	81.7	23	1703
Merluccius merluccius	GSA 6	OTB_DEF	Scenario 2	90.6	26	1143
Mullus barbatus	GSA 6	OTB_DEF	Baseline	8.8	144	26322
Mullus barbatus	GSA 6	OTB_DEF	Scenario 1	16.2	40	7162
Mullus barbatus	GSA 6	OTB_DEF	Scenario 2	48.7	45	4181
Nephrops norvegicus	GSA 6	OTB_DEF	Baseline	25.4	68	8305
Nephrops norvegicus	GSA 6	OTB_DEF	Scenario 1	38.0	19	2301
Nephrops norvegicus	GSA 6	OTB_DEF	Scenario 2	64.6	21	1346
Parapenaeus longirostris	GSA 6	OTB_DEF	Baseline	16.1	102	19135
Parapenaeus longirostris	GSA 6	OTB_DEF	Scenario 1	26.8	28	5251
Parapenaeus longirostris	GSA 6	OTB_DEF	Scenario 2	60.9	32	3111
Aristeus antennatus	GSA 6	OTB_DWS	Baseline	8.1	62	15303
Aristeus antennatus	GSA 6	OTB_DWS	Scenario 1	13.1	22	5298
Aristeus antennatus	GSA 6	OTB_DWS	Scenario 2	16.1	29	3656

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens
Merluccius merluccius	GSA 7	LLS_DEF	Baseline	36.9	54	1435
Merluccius merluccius	GSA 7	LLS_DEF	Scenario 1	34.2	66	1681
Merluccius merluccius	GSA 7	LLS_DEF	Scenario 2	36.9	75	1417
Merluccius merluccius	GSA 7	OTB_DEF	Baseline	38.2	20	551
Merluccius merluccius	GSA 7	OTB_DEF	Scenario 1	34.0	26	700
Merluccius merluccius	GSA 7	OTB_DEF	Scenario 2	31.2	36	899
Mullus barbatus	GSA 7	OTB_DEF	Baseline	28.6	7	289
Mullus barbatus	GSA 7	OTB_DEF	Scenario 1	26.0	9	373
Mullus barbatus	GSA 7	OTB_DEF	Scenario 2	55.6	13	340
Nephrops norvegicus	GSA 7	OTB_DEF	Baseline	34.5	22	2438
Nephrops norvegicus	GSA 7	OTB_DEF	Scenario 1	32.2	28	3169
Nephrops norvegicus	GSA 7	OTB_DEF	Scenario 2	39.9	39	2351
Parapenaeus longirostris	GSA 7	OTB_DEF	Baseline	30.1	23	2721
Parapenaeus longirostris	GSA 7	OTB_DEF	Scenario 1	27.0	30	3733
Parapenaeus longirostris	GSA 7	OTB_DEF	Scenario 2	45.5	41	2721
Aristeus antennatus	GSA 7	OTB_DWS	Baseline	21.3	8	1524
Aristeus antennatus	GSA 7	OTB_DWS	Scenario 1	14.1	20	3828
Aristeus antennatus	GSA 7	OTB_DWS	Scenario 2	49.4	24	2406
Merluccius merluccius	GSA 7	OTB_DWS	Baseline	72.7	8	40
Merluccius merluccius	GSA 7	OTB_DWS	Scenario 1	59.0	20	101

| *Merluccius merluccius* | GSA 7 | OTB_DWS | Scenario 2 | 55.3 | 24 | 123 |

FRANCE (GSA 7)

Species	Métier	Scenario	CV	n. of trips	measured specimens	Total PSUs
Merluccius merluccius	OTB_DEF	Baseline	24.8	170	5858	367
Merluccius merluccius	OTB_DEF	Scenario 1	31.2	100	3492	215
Merluccius merluccius	OTB_DEF	Scenario 2	29.7	110	3787	238
Merluccius merluccius	OTB_DEF	Scenario 3	33.1	110	3455	238
Mullus barbatus	OTB_DEF	Baseline	32.1	135	4545	367
Mullus barbatus	OTB_DEF	Scenario 1	39.2	79	2620	215
Mullus barbatus	OTB_DEF	Scenario 2	37.8	88	2943	238
Mullus barbatus	OTB_DEF	Scenario 3	38.5	88	2877	238

CASE STUDY 3, DEMERSAL STOCKS IN THE ADRIATIC SEA (GSAs 17 and 18)

For Croatia, the increase in fishing trips monitored does not show improvement in precision (Coefficient of variation, CV) compared to the status quo (Baseline). Therefore, the actual sampling plan can be maintained.

ITALY

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens	Total PSUs
Solea solea	GSA 17	GNS_DEF	Baseline	16.6	50	3436	62
Solea solea	GSA 17	GNS_DEF	Scenario 1	16.6	47	3186	58
Solea solea	GSA 17	GNS_DEF	Scenario 2	14.5	66	4538	82
Solea solea	GSA 17	GTR_DEF	Baseline	36.0	5	164	18
Solea solea	GSA 17	GTR_DEF	Scenario 1	35.4	7	226	26
Parapenaeus longirostris	GSA 17	OTB_DEF	Baseline	39.4	16	2627	70
Parapenaeus longirostris	GSA 17	OTB_DEF	Scenario 1	53.0	18	2910	78
Parapenaeus longirostris	GSA 17	OTB_DEF	Scenario 2	64.5	23	1605	101
Merluccius merluccius	GSA 17	OTB_DEF	Baseline	28.5	40	4470	70
Merluccius merluccius	GSA 17	OTB_DEF	Scenario 1	27.7	45	4864	78
Merluccius merluccius	GSA 17	OTB_DEF	Scenario 2	35.3	58	4249	101
Mullus barbatus	GSA 17	OTB_DEF	Baseline	16.5	52	10003	70
Mullus barbatus	GSA 17	OTB_DEF	Scenario 1	15.0	58	11512	78
Mullus barbatus	GSA 17	OTB_DEF	Scenario 2	18.8	75	7707	101
Nephrops norvegicus	GSA 17	OTB_DEF	Baseline	36.0	18	1566	70
Nephrops norvegicus	GSA 17	OTB_DEF	Scenario 1	37.0	20	1810	78
Nephrops norvegicus	GSA 17	OTB_DEF	Scenario 2	45.1	26	1850	101
Solea solea	GSA 17	TBB_DEF	Baseline	25.1	18	4018	20
Solea solea	GSA 17	TBB_DEF	Scenario 1	24.8	20	4388	22
Solea solea	GSA 17	TBB_DEF	Scenario 2	32.6	20	2433	22

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens	Total PSUs

Species							
Mullus barbatus	GSA 18	GNS_DEF	Baseline	50.8	5	309	30
Mullus barbatus	GSA 18	GNS_DEF	Scenario 1	46.9	6	436	33
Mullus barbatus	GSA 18	GNS_DEF	Scenario 2	46.0	6	303	33
Mullus barbatus	GSA 18	GTR_DEF	Baseline	55.4	5	195	17
Mullus barbatus	GSA 18	GTR_DEF	Scenario 1	51.8	9	337	19
Mullus barbatus	GSA 18	OTB_DEF	Baseline	54.5	9	195	30
Merluccius merluccius	GSA 18	LLS_DEF	Baseline	44.0	11	846	12
Merluccius merluccius	GSA 18	LLS_DEF	Scenario 1	34.9	20	1500	22
Merluccius merluccius	GSA 18	OTB_DEF	Baseline	22.5	43	7773	52
Merluccius merluccius	GSA 18	OTB_DEF	Scenario 1	19.9	57	10325	69
Merluccius merluccius	GSA 18	OTB_DEF	Scenario 2	20.2	57	8500	69
Mullus barbatus	GSA 18	OTB_DEF	Baseline	24.9	46	10986	52
Mullus barbatus	GSA 18	OTB_DEF	Scenario 1	22.0	61	14852	69
Mullus barbatus	GSA 18	OTB_DEF	Scenario 2	23.0	61	10760	69
Nephrops norvegicus	GSA 18	OTB_DEF	Baseline	26.0	21	5501	52
Nephrops norvegicus	GSA 18	OTB_DEF	Scenario 1	23.2	28	7583	69
Nephrops norvegicus	GSA 18	OTB_DEF	Scenario 2	24.5	28	5028	69
Parapenaeus longirostris	GSA 18	OTB_DEF	Baseline	17.6	41	28936	52
Parapenaeus longirostris	GSA 18	OTB_DEF	Scenario 1	15.8	54	36983	69
Parapenaeus longirostris	GSA 18	OTB_DEF	Scenario 2	16.2	54	16501	69

CASE STUDY 4, SMALL PELAGIC STOCKS IN THE ADRIATIC SEA (GSAs 17 and 18)

CROATIA

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens	Total PSUs
Engraulis encrasicolus	GSA 17	PS_SPF	Baseline	48.7	24	7114	72
Engraulis encrasicolus	GSA 17	PS_SPF	Scenario_1	41.3	35	10105	105
Engraulis encrasicolus	GSA 17	PS_SPF	Scenario_2	43.7	35	3428	105
Engraulis encrasicolus	GSA 17	PS_SPF	Scenario_3	43.9	28	8027	82
Sardina pilchardus	GSA 17	PS_SPF	Baseline	26.6	43	10074	72
Sardina pilchardus	GSA 17	PS_SPF	Scenario_1	22.0	63	14604	105
Sardina pilchardus	GSA 17	PS_SPF	Scenario_2	24.4	63	5773	105
Sardina pilchardus	GSA 17	PS_SPF	Scenario_3	24.6	51	11938	82

ITALY

Species	Area	Métier	Scenario	CV	n. of trips	measured specimens	Total PSUs
Engraulis encrasicolus	GSA 17-18	PS_SPF	Baseline	19.1	25	4816	28
Engraulis encrasicolus	GSA 17-18	PS_SPF	Scenario_1	16.4	35	6782	39
Engraulis encrasicolus	GSA 17-18	PS_SPF	Scenario_2	19.4	35	4199	39
Engraulis encrasicolus	GSA 17-18	PTM_SPF	Baseline	16.6	42	12212	46
Engraulis encrasicolus	GSA 17-18	PTM_SPF	Scenario_1	20.5	27	7915	30

Engraulis encrasicolus	GSA 17-18	PTM_SPF	Scenario_2	18.4	42	6524	46
Sardina pilchardus	GSA 17-18	PS_SPF	Baseline	27.8	4	516	28
Sardina pilchardus	GSA 17-18	PS_SPF	Scenario_1	27.7	5	676	39
Sardina pilchardus	GSA 17-18	PTM_SPF	Baseline	17.7	40	8946	46
Sardina pilchardus	GSA 17-18	PTM_SPF	Scenario_1	20.7	26	5947	30
Sardina pilchardus	GSA 17-18	PTM_SPF	Scenario_2	17.3	40	5165	46

Task 2.2 has been focussing on the sampling strategies and estimates associated to stomach content analyses and incidental by-catch of PET species monitoring.

The updated protocols and guidelines for collection, processing and analysis of stomach contents (STREAM D4.1, see Ligas, 2019) and the updated guidelines, protocols and handbooks for monitoring incidental bycatch (STREAM D4.3, see Ligas, 2019; FAO, 2019) were taken into account to identify aspects and specific topics to be addressed in the perspective of regional work plans for the Mediterranean and Black Sea.

In the Mediterranean and Black Sea, all the species of seabirds, sea turtles, marine mammals and elasmobranchs included in Appendix II (endangered or threatened species) and Appendix III (species whose exploitation is regulated) of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (the Barcelona Convention), together with elasmobranch species included in the IUCN Red List of Threatened Species, are considered as vulnerable. The implementation of bycatch monitoring programmes, carried out in standard way in order to make possible comparison between activities and countries, during commercial fishing operations, would allow scientists, end-users and decision-makers to obtain a more complete overview of the situation and to set priorities for management and conservation actions. This would also enable stakeholders to apply efficient mitigation measures (where needed), and to increase the protection on vulnerable species while securing the profitability of fisheries.

The focus of this Task has been on designing sampling coverage in order to obtain quantitative estimates of the potential impact of fisheries activities on the vulnerable species. This has been approached downstream the revision work made in WP1 and Task 2.2.

In the medium-long term, further work is needed to better tackle the aspects linked to the monitoring coverage (e.g., trips % coverage) that would be needed to achieve to gather robust and reliable information on PET bycatch. It would be also important to identify possible hot spots (fisheries, seasons and areas with high bycatch rates) that should be monitored with more effort, and where mitigation measures should be tested.

To increase the understanding on the trophic chains and the pool of resources sustaining the different phases of the life cycles of the most relevant demersal stocks is an important aspect to better evaluate some parameters of population dynamics (e.g., natural mortality) and to provide useful information for the stock assessment of such species. Studies of trophic ecology by means of stomach content analysis are therefore framed in the Ecosystem Approach for the resource evaluation and management, in agreement with the CFP and EUMAP indications. The previous projects MARE/2014/19 Med&BS and STREAM have refined the protocols of sampling and analysis of stomach contents. These protocols, discussed with primary end-users, were concentrate on the stocks of European hake, *Merluccius merluccius*, in Mediterranean waters, and turbot, *Scophthalmus maximus*, in the Black Sea. In the previous years, various MS carried out specific Pilot Studies based on stomach context, following the proposed methodology. Task 2.2 was aimed at furtherly refining the methodological aspects to share them with Member States, and to include them in the Regional Work Plans.

Three workshops were organized under Task 2.2; one of the workshops was co-organized in cooperation with the RCG Med&BS following the RCG 2021 Recommendation n. 4. The workshops successfully brought all the Med&BS Member States together to collaborate on addressing the knowledge and information gaps in a collaborative and coordinated manner.

A first Workshop on the monitoring of incidental bycatch of vulnerable species organized under the Task 2.2 of the STREAMLINE project met online on Tuesday the 14th December 2021, and was attended by 40 experts from the ten EU Member States of the Mediterranean and Black Sea, plus a representative of DG MARE. The Workshop was chaired by Paolo Carpentieri (NISEA, Italy), Task 2.2 Leader, in cooperation with Alessandro Ligas (CIBM, Italy), STREAMLINE Coordinator.

The Workshop on the stomach content data collection and analysis organized under the Task 2.2 of the STREAMLINE project met online on the 31st January 2022 (Microsoft Teams platform), and was attended by 54 experts from the ten EU Member States of the Mediterranean and Black Sea.

The STREAMLINE-RCG Med&BS Joint Workshop on data needed to assess the impact of fisheries on the marine ecosystem was held on the 28th April 2022, and was attended by 40 national experts from the ten Med&BS EU Member States (MS), the chair of the RCG Med&BS, Jurgen Mifsud (MAFA-DFA, Malta), and four representatives of the EU Commission (DG MARE and DG ENV). The group met virtually on a Zoom platform provided by the RCGs Secretariat, under the chairmanship of Alessandro Ligas (CIBM, Italy), coordinator of the STREAMLINE project.

The Joint Workshop agreed on a roadmap to draft proposals for non-binding regional work plans (RWP) on the monitoring of the incidental bycatch of vulnerable species and on fish stomach contents collection and analysis in the Mediterranean and Black Sea. These roadmap streamlined the work of WP4 in drafting the non-binding RWPs (in cooperation with WP2, the RCG, and NCs) that were submitted in October 2022 to the European Commission, and evaluated by the STECF EWG 22-18.

Under Task 2.3, a questionnaire based survey was conducted, in order to evaluate the similarities/differences between sampling methods applied in various countries, identify strengths and weaknesses, as perceived by the participants, of methodology used, and to record mitigation measures applied by data collectors in order to upgrade/refine the quality of data obtained.

The questionnaire was made available on-line in late November 2021 and ran for a period of two months and was widely distributed among the project partners as well as related for a (ICES, GFCM, RCG MED&BS).

The questionnaire was organised in five sections (Annex I):

1)   Section 1: General Description of the STREAMLINE project and targets. General information of the participant
2)   Section 2: Data collection – Methodology
3)   Section 3: General view on a regionally coordinated RF data collection and analysis
4)   Section 4: RF data collection and analysis
5)   Section 5: General view on the RF data collection and analysis program

Overall, 26 responses were yielded, with representatives from all Mediterranean-European countries participating in the survey, as well as experts from Finland, Ireland, the Netherlands, and the UK. Responders work in 22 out of the 31 Mediterranean GSAs, with the majority of them being involved in data analysis, on-site and off-site surveys. The principle drivers of data collection were for the needs of EUMAP and for assessment and management, and data was mainly collected at a national level (e.g. within prefectures, regions). For the purposes of data collection, a wide variety of methodology is being applied, and in general there is a combination of two or more methods. The most frequently used methods were on-site interviews, mobile applications and recall surveys, performed on a monthly basis. During the plenary discussion at the RCG Med&BS and STREAMLINE Joint Workshop on Recreational Fisheries (27th April 2022, online), the group of participants agreed on a draft proposal for a non-binding regional work plan (RWP) on recreational fisheries (RFs) in the Mediterranean and Black Sea and an associated roadmap. The draft proposal was circulated by the RCG Med&BS Chairs among the National Correspondents, and was then finalized via written procedure before the RCG Med&BS annual meeting in September 2022, with the support of STREAMLINE. The final approval was achieved during the RCG Med&BS annual meeting. The agreed draft proposal for a non-binding regional work plan (RWP) on recreational fisheries (RFs) in the Mediterranean and Black Sea is the following:

-       Estimation of the population of recreational fishers by segment (fishing gear-technique; e.g., shore, boat, spear fishing, etc.) and sub-region.

-       Identification of the list of priority species by sub-region.

Taking into consideration the recommendations and procedures proposed by the GFCM Handbook, and the experience gained by means of the implementation of the pilot studies, each MS will implement this task following their own procedures (e.g., telephone surveys, license system, etc.).

This draft proposal will be circulated by the RCG Med&BS Chairs among the National Correspondents, and will be considered, revised and finalized via written procedure before the RCG Med&BS annual meeting in September 2022, with the support of STREAMLINE.

The RCG Med&BS, supported by STREAMLINE, included this proposal in the draft non-binding RWPs that were submitted to the Commission and the STECF (STECF EWG 22-18 Evaluation of Work Plans for data collection and data transmission issues, 24-28 October 2022).

With the aim of facilitating the work of MSs and national experts involved in the data collection on RFs, the STREAMLINE Task 2.3 Core Team drafted a template for performing off-site surveys, and a template for on-site surveys. As a reference point, the protocols used in Greece and compiled by the Fisheries Research Institute (FRI) in Kavala, Greece, were used (Papadopoulos et al., 2022). The templates are reported in Deliverable D2.3, attached as Annex IV to this Final Report.

WP3 aimed at establishing processes for discussion, exchange and decision making with the RCG Med&BS, including with its broader institutional embeddedness in national data collection structures that will enable the RCG Med&BS to come to commonly agreed decisions on regional work plans.

During the WP3 meeting which was held online on the 9th November 2021, it was decided to propose the creation under the RCG Med&BS of a Steering Committee in charge of the decision-making process on RWPs. However, following a discussion with FISHN'CO, it has been considered as a more flexible approach establishing an Inter-Sessional Sub-Group (ISSG) with the mandate for drafting RWPs to be endorsed by the RCG during the annual meeting.
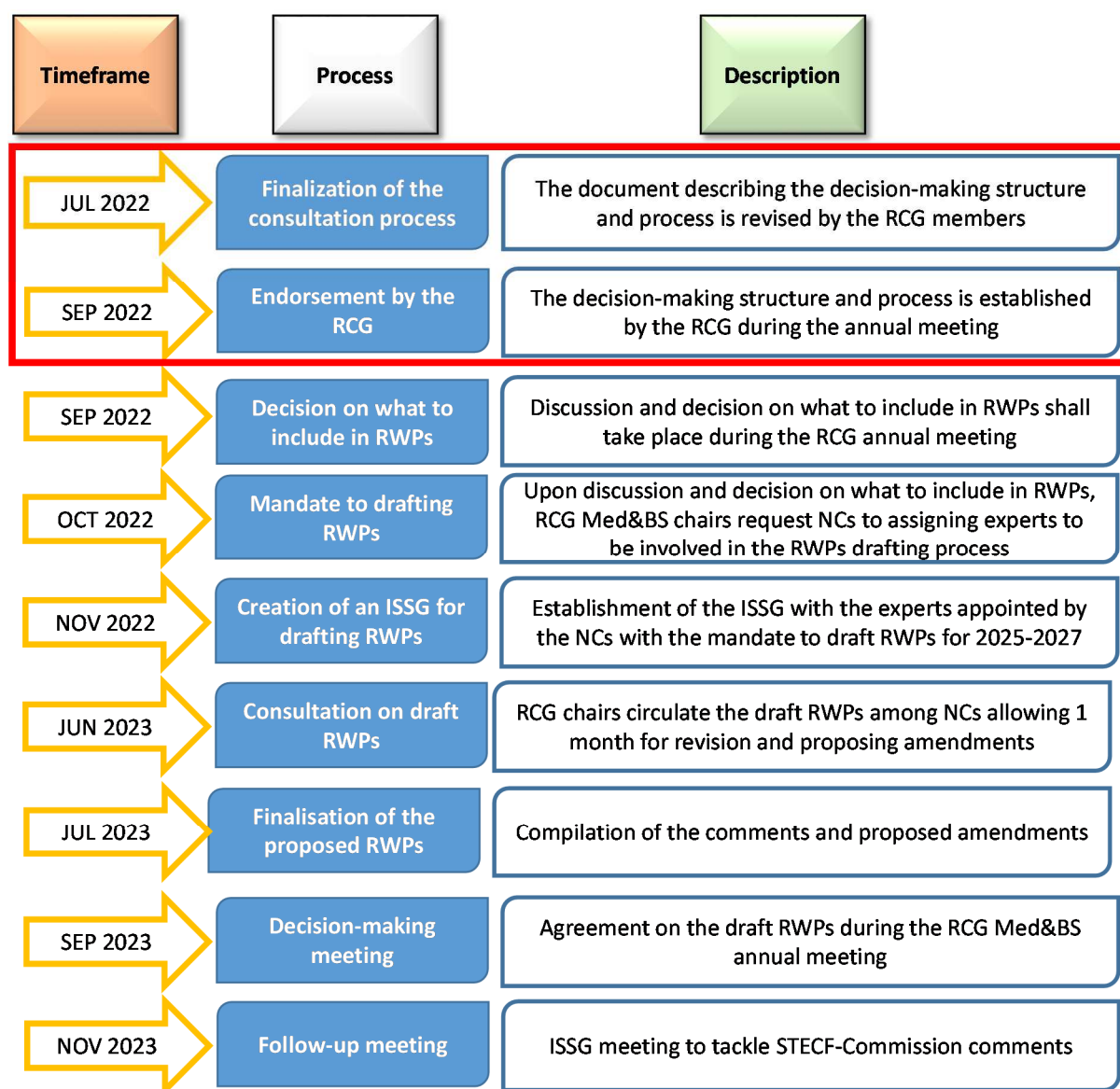
In addition, the candidate timelines that were presented by DG MARE during the RCG chairs and NCs meeting on the 10th March 2022 were taken into consideration to draft the timeline for the RCG Med&BS decision-making process.

The option agreed by the RCGs NANSEA and Baltic considers the timeline as suggested by STECF EWG 21-17, where the submission of RWPs to the NCs should be in June 2023 and to the COM by 15 October 2023.
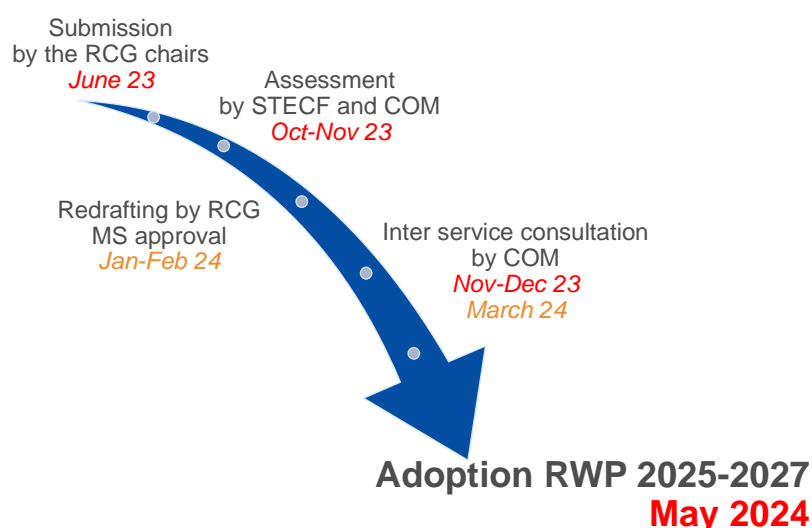
In the light of this timeline, the proposal for a general approach to decision-making structure and process for developing RWPs was drafted and presented to the RCG Med&BS annual meeting in September 2022.

The phase included in the red rectangle represents the preliminary steps in the process, and involves the endorsement by the RCG Med&BS of the proposed decision-making structure and process.

Timeframe	Process	Description
JUL 2022	Finalization of the consultation process	The document describing the decision-making structure and process is revised by the RCG members
SEP 2022	Endorsement by the RCG	The decision-making structure and process is established by the RCG during the annual meeting
SEP 2022	Decision on what to include in RWPs	Discussion and decision on what to include in RWPs shall take place during the RCG annual meeting
OCT 2022	Mandate to drafting RWPs	Upon discussion and decision on what to include in RWPs, RCG Med&BS chairs request NCs to assigning experts to be involved in the RWPs drafting process
NOV 2022	Creation of an ISSG for drafting RWPs	Establishment of the ISSG with the experts appointed by the NCs with the mandate to draft RWPs for 2025-2027
JUN 2023	Consultation on draft RWPs	RCG chairs circulate the draft RWPs among NCs allowing 1 month for revision and proposing amendments
JUL 2023	Finalisation of the proposed RWPs	Compilation of the comments and proposed amendments
SEP 2023	Decision-making meeting	Agreement on the draft RWPs during the RCG Med&BS annual meeting
NOV 2023	Follow-up meeting	ISSG meeting to tackle STECF-Commission comments

The proposals of STREAMLINE, including the outcomes of WP3, were presented during the RCG Med&BS annual meeting that took place on 6-9 September 2022. The proposals were endorsed by the RCG Med&BS, and were included in the relevant recommendations:
- Recommendation n. 2 "Drafting of the RWP on recreational fisheries to be submitted by September-October 2023 (implementation 2025-2027) and RCG Med&BS Workshop on recreational fisheries";
- Recommendation n. 3 "Drafting of the RWP on PETs bycatch monitoring to be submitted by September-October 2023 (implementation 2025-2027) and RCG Med&BS Workshop on PETs bycatch monitoring";
- Recommendation n. 5 "Drafting of the RWP on fish stomachs collection and analysis to be submitted by September-October 2023 (implementation 2025-2027) and RCG Med&BS Workshop on fish stomachs collection and analysis";

- Recommendation n. 8 "RCG MED&BS 2022 proposed to establish an ISSG for sampling optimisation".

The activities foreseen under these recommendations shall be performed in cooperation with the ISSG on RWPs which will be in charge of the decision-making process for developing RWPs, as described in STREAMLINE WP3 Deliverable D3.1 "Definition of the decision making structure". A timeline for the establishing of the ISSG RWPs and its future activities are described in D3.1, and also reported in the RCG Med&BS 2022 Report.

The draft RWPs have brought together the existing knowledge from earlier regional grants and MS pilot studies, as well as the additional work carried out under this grant, and were shared and discussed with the RCG Med&BS for their endorsement.

STREAMLINE WP4, in cooperation with the RCG Med&BS, drafted a non-binding RWP that was submitted to COM in October 2022 for consideration by the STECF EWG 22-18.

The non-binding RWP for 2023 included the following points:
- Regional coordination for sampling marine recreational fisheries (Text Box 2.4);
- Regional coordination for sampling plan for biological data (Text Box 2.5);
- Regional coordination for Research surveys at sea (Text Box 2.6 and Table 2.6);
- Regional coordination for the monitoring of the incidental catches of sensitive species (Text Box 4.2);
- Demersal fish stomach contents collection and analysis (Text Box 4.3 and Table 4.1).

This non-binding RWP represented the Deliverable D4.1 of the STREAMLINE grant.

The STECF EWG 22-18 appreciated the well-designed proposed non-binding RWP and acknowledged the work done to propose such an advanced version. On the section on recreational fisheries, the proposed Text Box 2.4 was considered close to being ready for a more official binding version. The section on sampling plan for biological data was considered by STECF EWG 22-18 as displaying work in progress and was not in the form of an agreed RWP at the moment. The STECF EWG 22-18 acknowledged the work done and was of the opinion that all elements are almost ready to be part of a RWP, provided that one of the three scenarios proposed can be agreed. Then the relevant information from the candidates Regional Sampling Plans can be included into Table and Text Box 2.5 and Annex 1.1.

The section on Research surveys at sea was considered as almost ready to be included in an official RWP. All internationally coordinated surveys have been included in Table 2.6 and is filled by each participating MS accordingly. The Text Box 2.6 should contain regional maps of survey coverage by MS and include links on handbooks, external reports and RCG recommendations (all cited in the proposal without links, this recommendation is valid for all textboxes).

The section on the monitoring of the incidental catches of sensitive species needs further development. According to STECF EWG 22-18, it is difficult to make a distinction between the text originating from the WP template and filled by the RCG. We suggest to organise Text Box 4.2 better, so it is easier to read. The monitoring of incidental bycatch of sensitive species is highly related to the biological sampling. The RSP of PETS be included in Table 2.5 as a link to the RWP and codes in relation to PETS are given in the Table.

The section on fish stomach contents collection and analysis is almost ready to be included in an official RWP. The link proposed in Table 4.1 should be updated to be more precise in pointing on the relevant information.

The general section of the textbox and generic tables (Tables 1.1, 1.2, 1.3 and 2.1) need further development in order to form part of an official RWP. More detailed descriptions of the elements included in the RWP would be welcome, e.g. a list of all MSs involved in the RWP, a clear indication of MS involved in each section, who to contact and contact details (RCG chairs or RCG secretariat) for any questions. The generic tables and information for the general textbox are known to exist as part of RCG Med&BS annual work and are deemed to be easy parts to include in the RWP.

In light of the advanced stage of the proposed non-binding RWP 2023, the STECF EWG 22-18 recommended to the RCG Med&BS to align with RCG NANS&EA, Baltic, ECON and Large Pelagics on the

objective of presenting an official RWP 2025-2027 to the RCG Technical meeting 2023. These official RWP 2025-2027 will be the first of their kind and will allow for a learning experience on how it works together with NWPs and prepare the ground for improvements in future versions. For this to happen, a first version will need to be circulated to all relevant MS as early as possible in 2023. The EWG welcomes the resumption of the pan-regional ISSG on setting up Regional Work Plans which will take over from both Fishn'Co and Streamline projects in helping produce the final draft of RWP to be proposed in RCG 2023.

During the last period of implementation, the STREAMLINE grant further liaised with the RCG Med&BS to secure a smooth handover between the project and the relevant Intersessional sub-groups (ISSGs) and other initiatives under the RCG in charge of working on future developments of regional work plans. This was achieved by means of the organization of two joint meetings between the STREAMLINE consortium and the RCG Med&BS. The two joint meetings took place online on the 21st November and 21st December 2022, respectively, and were aimed at:
   - Presenting and discussing the draft non-binding RWP for 2023 drafted by STREAMLINE and the RCG Med&BS;
   - Presenting and discussing the outcomes of STECF EWG 22-18 on the evaluation of the draft RWPs for the Med&BS;
   - Presenting and discussing the outcomes of the FISHN'CO workshop (18-20 October 2022, Vigo, Spain);
   - Drafting of a roadmap for the hand over between the grant and the RCG.

In addition, the meetings agreed on some urgent actions to be taken at RCG level. The RCG Chairs contacted all the NCs asking to nominate up to two national experts to be involved in the work of each of the following ISSGs:
1.   ISSG/Workshop on recreational fisheries RWP, according to Recommendation n. 2 of the RCG Med&BS 2022; the time frame for the workshop is June-July 2023, and three possible chairs were already identified;
2.   ISSG/Workshop on PETs bycatch monitoring RWP, according to Recommendation n. 3 of the RCG Med&BS 2022; the time frame for the workshop is April-May 2023, chairs have to be nominated;
3.   ISSG/Workshop on RWP on fish stomachs collection and analysis, according to Recommendation n. 5 of the RCG Med&BS 2022; the time frame for the workshop is April-May 2023, chairs have to be nominated;
4.   ISSG on RWPs which will be in charge of the decision-making process for developing RWPs, according to Recommendations n. 2, 3 and 5; chairs to be nominated.
Together with the requests above, the NCs were also asked for the updating/complementing of the list of the national experts for the ISSG/Scientific Network on the sampling optimization (Recommendation n. 8 of the RCG Med&BS 2022).

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ATTACHMENTS

Please click on the   at the top left to open the annexes

Annex I – Deliverable D1.1 "Maps of existing elements and gaps"

Annex II – Deliverable D2.1 "Reports of the workshops and results of sampling design optimization for selected case studies"

Annex III – Deliverable D2.2 "Reports of the workshops under Task 2.2"

Annex IV – Deliverable D2.3 "Reports of the workshops under Task 2.3"

Annex V – Deliverable D3.1 "Definition of the decision making structure"

Annex VI – Deliverable D4.1 "Draft regional work plans"

Annex VII – Data Sharing Agreement