



**GENERAL FISHERIES COMMISSION
FOR THE MEDITERRANEAN
COMMISSION GÉNÉRALE DES PÊCHES
POUR LA MÉDITERRANÉE**



SCIENTIFIC ADVISORY COMMITTEE (SAC)

Sub-Committee on Stock Assessment (SCSA)

**DRAFT REPORT OF THE 14th SESSION OF THE SUB-COMMITTEE
ON STOCK ASSESSMENT (SCSA)**

FAO HQ, Rome, Italy, 18-20 February 2013

*** Available only in English**

OPENING AND ARRANGEMENTS OF THE SUB-COMMITTEE MEETINGS

1. The Sub-Committees meetings of the Scientific Advisory Committee (SAC/GFCM), including the general transversal session, were held at FAO headquarters, Rome (Italy) on 18-20 February 2013.
2. Mr Henri Farrugio, Chairperson of the SAC, welcomed the participants and thanked them for attending the meeting. He then gave the floor to Mr Abdellah Srour, Executive Secretary of the GFCM.
3. Mr Srour expressed sincere gratitude to the Chairperson of the SAC and to all the coordinators of the Sub-Committees for their work. He recalled the mandate of the SAC and its Sub-Committees, insisting on the need to strengthen their role, and mentioned upcoming activities by the GFCM, including those within the first GFCM Framework Programme (FWP). Mr Srour underscored the regional interest that these activities were drawing. He stressed the extremely positive role played by the FAO regional projects within the framework of fisheries management in the Mediterranean and Black Sea, insisting on the need for enhanced integration and synergies between their activities and those implemented through the GFCM Strategic Framework Programme 2013-2018.

**TRANSVERSAL SESSION: INTRODUCTION OF ONGOING ACTIVITIES UNDER
THE FIRST PHASE OF THE GFCM FRAMEWORK PROGRAMME**

4. Mr Miguel Bernal, from the GFCM Secretariat, presented a synthesis of the work to be done by the Sub-Committees as well as an overview of the FWP. In this respect, he introduced the five work programmes (WP) composing the GFCM Framework Programme (i.e., WP01: Governance and Management, WP02: Data Collection, WP03: Aquaculture, WP04: Artisanal Fisheries/Recreational Fisheries and WP05: Sub-regional Cooperation), which should be implemented progressively over an allotted five-year span, and focused on WP01 and WP02 since they had already been launched thanks to

EU funding. Mr Bernal specified that activities undertaken were connected for the time being with the strengthening of data collection systems and the testing of the GFCM guidelines on multiannual management plans at a sub-regional scale.

5. Mr Marcelo Vasconcellos, from the GFCM Secretariat, provided additional insights on activities carried out in relation to the sub-regional multiannual management plans, highlighting the guiding principles underpinning the chosen methodology and presenting a list of potential case studies and a roadmap for applying the guidelines to those cases.
6. Mr Nicola Ferri, from the GFCM Secretariat, briefed the participants on the launching of the “Concerted action for Lebanon”, which started with an initial meeting organized within the framework of WP05 of the FWP. He insisted in particular on the importance of pooling ongoing efforts at different levels in order to ensure a coherent strategy in support to the development of fisheries and aquaculture in Lebanon.
7. The meeting agreed that discussions and comments made during the transversal session be included in the reports of each Sub-Committee under the corresponding agenda item.
8. Mr Farrugio acknowledged the work undertaken by the GFCM Secretariat and opened the discussion on the presentations delivered (data collection, multiannual management plans, Concerted action for Lebanon).
9. The representatives from the EU also thanked the GFCM Secretariat for the valuable work done and for the excellent organization of the meeting and reiterated their will to support GFCM, in particular, with the auspices/commitments underlined by the Part III of the GFCM Guidelines for multiannual management plans. Under the FWP, the need to give priority to case studies on sub-regional multiannual management plans involving shared stocks either subject to excessive exploitation or of species that are vulnerable to overexploitation was stressed. At the same time, it was also underlined that the multiannual management plans should be seen as the normal scientific and regulatory framework to agree and implement joint management measures also for fisheries and stocks exploited in a sustainable manner.
10. Mr Majdalani, from Lebanon, thanked GFCM for launching the “Concerted action for Lebanon” meeting which, in his view, would help to put cooperation in Lebanon on the right track and paving the way for future activities. In response to comments questioning a possible overlapping with the work carried out by the FAO Regional Projects, it was explained that a participatory approach had been ensured and that the maximum level of coordination was foreseen for the follow-up phase in order to avoid any possible duplication and to optimize resources.
11. The participants expressed interest for the new Data Collection Reference Framework (DCFR), which was briefly presented by Mr Bernal and for which a broader discussion took place under SCSI. The meeting was informed that, since the performance review of the GFCM had highlighted gaps in the data collection and submission processes, the thrust of the DCRF was to ensure that the data to be gathered in the future were useful for the management of fisheries. To start this process, a series of activities aimed at strengthening the GFCM framework for data collection had already been launched. These included the assessment of data compliance and databases at the GFCM Secretariat, the assessment of national data collection systems, and the design of a data collection reference framework consistent with the GFCM objectives.
12. Some questions were raised regarding a possible support to the countries for the implementation of the sub-regional multiannual management plans as well as the participatory approach to be used to account for the views of fishermen. The Executive

Secretary confirmed that the FWP was meant to assist the GFCM members, in particular those in the South Mediterranean and the Black Sea, as corroborated by WP05. The EU stressed that sub-regional multiannual management plans were also aimed at fostering the building-up of a scientific basis for the sustainable management of fisheries in all GFCM member countries.

13. Finally, Mr Bernal briefly presented the regional workshop on sustainable artisanal fisheries for the Mediterranean and the Black Sea (planned in September–October 2013 in Malta). He underlined the importance of this event, whose main objective would be to address recurrent issues in the small-scale fisheries sector in a comprehensive way through five thematic sessions. The five thematic sessions of the workshop, were introduced, namely: i) Current situation of artisanal fisheries in the Mediterranean and Black Sea, strategy and methodologies for effective monitoring, ii) Strategies for the co-management of artisanal fisheries, iii) Integration of artisanal fisheries within marine protected areas (MPAs), iv) Enhancing the artisanal fisheries value chain and v) Providing support and education for the establishment of a regional platform for artisanal fishermen. A tentative list of potential partners interested to co-sponsor the event was also shown.
14. In the ensuing discussions, several issues were addressed, such as: the focus not only on artisanal but also on recreational fisheries, the integration and/or management of artisanal fisheries within MPAs and the importance of sharing experiences among fishermen, the importance of the environmental effects of artisanal fisheries in the coastal zones, interactions with sea turtles, cetaceans and monk seals, and the need for mitigation measures.
15. It was proposed that one potential output of this workshop could be the establishment of a first project on artisanal fisheries for the whole region. Consequently, interested organizations, participants and stakeholders were strongly encouraged to contact the GFCM Secretariat by e-mail in order to examine modalities for their involvement in the workshop.
16. It was highlighted that the organization of the workshop could build momentum from the ongoing FAO initiative on small-scale fisheries – a technical consultation to debate about the adoption of the “FAO International Guidelines on Securing Sustainable Small-Scale Fisheries” was foreseen on 20–24 May 2013. Hence, interested parties present at the meeting were invited to participate. The outcomes of this technical consultation would be submitted to the next session of the FAO Committee on Fisheries (COFI) in 2014 and could be informed by the conclusions and recommendations of the workshop.

OPENING AND ARRANGEMENT OF THE MEETING OF THE SUBCOMMITTEE ON STOCK ASSESSMENT (SCSA)

17. The 14th meeting of the Sub-Committee on Stock Assessment (SCSA) of the SAC was held in Rome (Italy) from 18th to 20th February 2013. It was attended by 39 experts from 11 Members (Albania, Algeria, Croatia, Egypt, Italy, Montenegro, Morocco, Slovenia, Spain, Tunisia, Turkey) as well as by representatives from the European Commission, GFCM Secretariat, FAO, FAO Regional projects (EastMed, CopeMed II, AdriaMed, MedSudMed), WWF and UNEP/MAP and RAC-MED. The list of participants is provided in Appendix B.

INTRODUCTION OF THE SCSA MEETING AND ADOPTION OF THE AGENDA

1. The meeting was opened by Mr Fabio Fiorentino (Chair of the SCSA) who welcomed the participants and introduced the agenda.
2. Mr Miguel Bernal, from the GFCM Secretariat, gave a brief overview of the agenda and introduced the GFCM Sharepoint online tool and in particular the section dedicated expert groups and Sub-Committees.
3. The meeting unanimously elected Ms Piera Carpi, from CNR-ISMAR, Italy, and Ms Dominique Bourdenet, from the GFCM Secretariat, as rapporteurs for the sessions.
4. Mr Fabio Fiorentino announced that he would not be in a position to assume the duty of chairperson of the SCSA anymore and asked the Subcommittee to discuss and help identify a new chairperson. Potential and interested candidates were invited to contact the GFCM Secretariat or Mr Fiorentino so that the election could take place before the end of the Subcommittee meetings, as anticipated in the agenda due to the end of the term for the Chairs of the SC. Mr Miguel Bernal on behalf the GFCM Secretariat thanked Mr. Fiorentino for all his efforts in his duty as SC chair.
5. The draft agenda was reviewed and adopted with slight changes as it appears in Appendix C to this report.

REVIEW OF NEW STOCK ASSESSMENTS OF DEMERSAL SPECIES AND RELATED SCIENTIFIC ADVICE (AS VALIDATED BY THE WORKING GROUPS ON STOCK ASSESSMENT OF DEMERSAL SPECIES)

6. The main outcomes of this working group were presented by the WG and SCSA coordinator Mr Fabio Fiorentino.
7. The meeting of the SCSA Working Group on Demersal Species was held in Split, Croatia from 5 to 9 November 2012, and was attended by 27 participants from 10 countries: 6 were from Italy, 3 from Spain, 2 from France, 2 from Tunisia, 2 from Romania, and 1 from each of the remaining 5 countries (Algeria, Bulgaria, Egypt, Montenegro and Morocco), 5 representatives of FAO Regional Projects, and 2 representatives from GFCM Secretariat.
8. Overall, 28 assessments and one related work were presented of which 19 referred to stocks of 11 fish species and 9 to stocks of 4 crustacean species. Of the 19 assessments on fish stocks, 6 referred to *Merluccius merluccius*, 3 to *Mullus barbatus*, 2 to *Lophius budegassa* and 8 to 1 stock of the following species: *Mullus surmuletus*, *Pagellus erythrinus*, *Pagellus bogaraveo*, *Saurida undosquamis* (a lessepsian species of commercial importance for Egypt), *Solea solea*, *Squalus acaanthias*, *Merlangius merlangus* and *Psetta maxima*. From the 9 assessments on crustacean 4 stocks referred to *Parapenaeus longirostris*, 3 to *Aristaeus antennatus*, 1 to *Nephrops norvegicus* and 1 to *Squilla mantis*. With respect to the assessments by GFCM geographical sub-area, 21 assessments were confined within one subarea (4 assessments referred to GSA 05, 4 to GSA 06, 3 to GSA 07, 3 to GSA 17, 3 to GSA 29, 2 to GSA 18, 1 to GSA 01, 1 to GSA 25) and 7 assessments spanned over more than one GSA (3 for GSAs 15-16, 2 for GSAs 01-03 and GSA 04, 2 for GSAs 12-16).
9. Regarding methodologies, different models were used for the assessments (VPA, LCA, XSA, Y/R, production models, SS3), and in some cases short and medium-term predictions were carried out using predictive models. All the assessments were carried

out previously. During the working group meeting, the general aspects of the assessments performed, including the methods and data used, the stock status and a summary of the resulting scientific advice all were thoroughly revised. Overall, 24 stocks were validated by the group, all of them classified as in overfishing status, and 4 were considered preliminary for which advice to improve the analysis was also provided.

10. The Sub-Committee proceeded with the review of the stock assessments by area and species as presented in the report of the above Working Group. Only the assessments validated by the WG were examined by the Sub-Committee. The main information, results, advice and recommendations of the stock assessments carried out by the Working Group on Stock Assessment of Demersal Species, with main comments can be consulted in the WG report at

http://151.1.154.86/GfcmWebSite/SAC/SCSA/WG_Demersal_Species/2012/WGSA_Demersal_Split_Report.pdf .

The review of the new stock assessments, with the recommendations made by the SC are summarised in table 1 of Appendix A of this report.

11. Seven assessments of shared stocks have been carried out in the WG with the support of FAO Regional projects, from which the Group validated five.
12. The SC acknowledged the FAO Regional projects (Adriamed, Copemed II, Eastmed and Medsudmed) for the relevant support in improving the assessments of shared stock in the Mediterranean by the activities of their WG.

REVIEW OF MAIN GENERAL RECOMMENDATIONS AND COMMENTS DONE BY THE WORKING GROUP ON STOCK ASSESSMENT OF DEMERSAL SPECIES

13. The SC in general endorsed the general recommendations made by the WG, with the following comments:

- In relation to the recommendation number 18 of the WG report: “The WG considers more appropriate to propose fishing effort reduction through multiannual management plans always taking into consideration the socio-economic impact of the proposed measures” the SC made the following considerations:
 - i. The SC welcomes suggestions on management options to be proposed by the WG, but sees that the main objective of the assessment WG should be on assessment and advice on the state of the stocks.
 - ii. Recommendations of management options should always be in accordance with the GFCM guidelines for management plans. Recommendations should be unambiguous, and their terminology and wording should carefully follow the GFCM guidelines and glossary (see also the general comment on the *SC general recommendation* section on language used in the reports). When a recommendation on management option emanates from the WG, it should be presented as potential alternatives to be further discussed at the SC level and the SAC.
- In relation to the framework for empirical reference points on biomass

discussed on the WG, the SC refers to its general recommendation for the definition of reference points (see the *SC general recommendation* section).

REVIEW OF NEW STOCK ASSESSMENTS OF SMALL PELAGIC SPECIES AND RELATED SCIENTIFIC ADVICE (AS VALIDATED BY THE WORKING GROUP ON STOCK ASSESSMENT OF SMALL PELAGIC SPECIES)

14. The main outcomes of this working group were presented by Ms Piera Carpi and by the SCSA coordinator.
15. The meeting of the SCSA Working Group on Small Pelagic Species was held in Split, Croatia from 5 to 9 November 2012, and was attended by 19 participants from GFCM Member Countries, FAO Regional Projects as well as representatives of the GFCM Secretariat.
16. A total of 12 stocks or stock units analyses from 8 GSA areas were presented to the WG, from which a total of 10 stocks were formally assessed (a stock status advice was produced). For 3 of the 10 stocks formally assessed (sardine in GSAs 01 and 03, sardine in GSA04 and horse mackerel in GSA29) the assessment were considered preliminary, while the rest of the formally assessed stocks (7) were considered validated by the group. All the assessments were done before the meeting although some extra analysis in some of the stocks was carried out during the meeting
17. Sardine and anchovy were the two species analysed in most of the areas, while the Black Sea presented sprat and horse mackerel.
18. Within the seven validated stocks assessments, 3 stocks were considered fully exploited, 3 as sustainable exploited and one as overexploited.
19. The number of stocks assessed was similar to previous years. However, the WG noted the absence of Spanish scientists to the group and therefore the lack of assessments for small pelagics in the related GSAs. Two new stocks on the Black Sea that were not assessed by this Group were incorporated this year.
20. An error in the terminology used for the advice on the status of the stock in the summary table and in some of the individual stock summaries of the report of the WG on the assessment of small pelagics was detected. *Fishing effort* was used in the recommendation row of the table, while it should have been *Fishing mortality*. The chair of the WG and the Secretariat backstopping officer confirmed this was a typographic error, as the correct term *Fishing mortality* is the one used in the stock assessment forms. However, the notion of control on fishing effort was also suggested in some stocks (e.g. in anchovy in GSA 16), but only in management recommendations, not in stock status report. An amended report has been prepared in which the summary table was corrected. A general comment (see the *SC general recommendation* section) was made in the SC that careful review of the contents, terminology and language of the reports should be made.
21. The main information, results, advice and recommendations of the stock assessments carried out by the Working Group on Stock Assessment of Small Pelagic Species, with main comments of the SC can be consulted within the report of the Working group at the following link:

https://gfcml.sharepoint.com/EG/Background%20Documents/WGSA_SmallPelagic_Split

[Report FINAL.pdf](#)

The review of the new stock assessments, with the recommendations made by the SC are summarised in table 2 of Appendix A of this report. Only the assessments endorsed by the WG were examined during the SC.

REVIEW OF MAIN GENERAL RECOMMENDATIONS AND COMMENTS DONE BY THE WORKING GROUP ON STOCK ASSESSMENT OF SMALL PELAGIC SPECIES

22. In general, the SC endorsed the general recommendations made by the WG. However, in relation to the recommendation on biomass reference points provided by the WG, the SC provided a series of general recommendation to be applied to small pelagic stocks, as detailed in the *SC general recommendation* section below.

OTHER METHODOLOGICAL ISSUES RELEVANT TO SCSA

23. BEMTOOL and “Assessment for all” (A4A) modelling initiatives

- Ms Maria Teresa Spedicato presented relevant issues regarding the Bio-Economic modelling tools BEMTOOLS as a support to multi-objective approaches to fisheries management. She introduced in particular the project structure and the main features of this platform of tools, which enables to simulate the effects of management measures and/or harvesting strategies in the short, medium and long term. She also gave an overview of the main processes, functionalities, modules and configuration of the software. Questions raised were mainly related to the main components of the tool and the approach used, the plans for the use of the project as well as possible training to teach how to use this tool. In this respect, it was clarified that the goals of the project were to take advantage of the existing expertise and provide an instrument to scientists as well as tool to facilitate an integrated approach without the need for a specific expertise in programming. It was also mentioned that a manual would be produced.
- Mr Ernesto Jardim presented the “Assessment for All” Initiative (a4a), which aimed to: (i) develop a stock assessment method targeting stocks that have a reduced knowledge base on biology and a moderately long time series on exploitation and abundance, (ii) trigger the discussion about the problem of massive stock assessment, and (iii) promote capacity building for stock assessment. He introduced mainly the rationale, objectives and activities of the initiative, presented some simulations and highlighted the opportunities and vision. Several comments were raised regarding the approach and its scientific features. It was clarified in particular that the A4a initiative came from a long process and that the aim was to achieve standard methodologies which were not necessarily data-rich stocks, without requiring strong statistical technical background. The vision underpinning the initiative was also discussed, especially its inclusive dimension underlined with the “for all” term, which could be interpreted as “for all species”.

24. Stock assessment forms:

- Mr Miguel Bernal presented the main aspects related to the new stock assessment forms: main contents and sections, incorporation of environmental variables, summary

sheets, dissemination and access to the forms were dealt with. The SC made a specific recommendation to include a history of previous recommendations from the SAC in each stock.

- It was recommended that the revised assessment forms be disseminated well in advance of the next working groups. The new stock assessment forms would be placed on the Sharepoint so that the registered users could access them. New users should be known well in advance by the GFCM Secretariat. Drafts forms could also be published on the GFCM public web page (this should also be addressed by the SAC).
25. Mr. Bernal briefly presented a proposal for the preparation of a regular publication on the status of Mediterranean and Black Sea fisheries, based on the advice on stock status provided by the Assessment Working Groups and the information on fisheries included in the Stock Assessment Forms and in the GFCM databases. The SC agreed on the proposal and suggested that an improved individual stock report template be prepared in order to facilitate this publication (see also the planned activities in the SCSA 2013 work plan).

FOLLOW-UP ISSUES

26. No new development on the protocol for surveys at sea were presented to the SC
27. The SC was briefly informed on the advances of the organization of a cooperative EIFAAC/ICES/GFCM working group on European Eel during 2013 and interested participants were invited to approach the Secretariat in this respect.
28. The SC discussed on needs for the improvement of scientific advice on the status of stocks, and concluded on a series of recommendations included in the SCSA 2013 work plan section below.

SCSA RECOMMENDATIONS

29. Recommendations on the scientific advice and assessment WG comments to individual stocks are provided in Appendix A, while general recommendations are provided below.

Demersal species:

- a. The SC recommended using an agreed common set of biological parameters for the same stock at sub-regional level.
- b. The SC noted that the $F_{0.1}$ from the Yield per recruit analysis was considered as a proxy for F at MSY . F_{MSY} or its proxies can in some context be considered as target reference points, in this case creating an inconsistency, as the same numerical value would be used as a limit and target reference point. This should be further investigated and solved in the context of a general revision of Reference Points (see also recommendation j below).
- c. The SC noted that in some assessments the use of VMS data was recommended to improve the assessment, while in others VMS was not cited. The SC recommended that the WG recommendation to use VMS for stocks such as striped red mullet in GSA 05 or common sole in GSA17 be justified (i.e. providing the reasons why VMS is expected to improve a particular assessment).

- d. The SC recommended investigating those stocks of lessepsian species that, in many areas of the Mediterranean, compete with, or have even replaced as main targets of the fishery, the autochthonous stocks, being able to endure conditions of high fishing pressure. Research on these types of stocks could be conducted transversally with SCMEE and in collaboration with those Mediterranean countries affected by these species. Management issues regarding lessepsian species should also be addressed by SAC.
- e. For *Aristeus antennatus* in GSA 06, two different assessments have been provided by the WG. Although the SC welcomes different scientific contributions addressing the same stock, the WG strongly recommended that a single integrated assessment be provided with all the information available, with the aim to formulate a consistent advice for management.
- f. If for a given species in neighbourhood, independently evaluated, stocks, exploitation patterns and biological parameters are the same, the SC recommended to consider the use of common reference points.

Small pelagic species

- g. The SC raised concerns on the conceptual definition of the limit biomass reference points proposed in this year's WG on small pelagic and recommended to further examine this issue. Also, the SC recommended that the role of small pelagic fish in the ecosystem – e.g. its intermediate position in the food web and the dependence of other species on the production of small pelagic fish for its own growth – be taken into account when revising the reference point definitions for these species (see also recommendation *j* below).

All species

- h. The SC recommended that a careful review of the language, terms and scientific content of the reports of the Assessment Working Group be done before the SC. In order to do this, and making use of the online facilities provided by the Secretariat, an online review group was suggested to be established. The Review Group should include the chairmen's of the two Assessment WG, the Chairman of SCSA and the representatives of the Secretariat, incorporating external reviewers as needed. The Review Group should review the report and draft advice as provided by the Assessment WGs and produce a consolidated report of the WG to be presented and discussed at the SC. Following the recommendations of the GFCM commission, the SCSA should focus its review on the Scientific Advice and Recommendations provided in those reports.
- i. The SC recommended that a standardized criteria for classification of advices into preliminary and validated, incorporated if necessary other classes, be defined.
- j. The SC suggested reviewing the existing reference point framework in the light of the 2012 GFCM Guidelines on multiannual management plan, and in order to define target, limit and precautionary reference points that could be used in the assessment WGs.
- k. When formal stock assessments have produced feasible BRP, the SC recommended preferring these BRP to those derived by empirical approach in order to give a standard judgment on stock status.
- l. The SC recommended continuing to increase the number of stocks with defined

reference points as well as the number of conceptual reference points available (i.e., in addition to a reference point on exploitation rate, it would be desirable to have also reference points for F and biomass).

- m. The SC recommended that revised Stock Assessment Forms be provided to WG participants in advance of next year assessment WGs. The revised Stock Assessment Forms should incorporate the comments from the assessment WG and SCSA and also incorporate an improved standardized individual stock status report format.
- n. The SC recommended that information from the assessment WGs together with information on Mediterranean and Black Sea fisheries be used to provide a regular report on the status of Mediterranean and Black Sea fisheries.
- o. The SC recommended that the utility of genetic/genomic/other methods to assist in stock unit identification, migration patterns and exchange rates between meta-populations in the Mediterranean context be further investigated.

ANY OTHER MATTERS

30. Ms Samia Ben Smail, from the CNRDPA of Algeria, presented an updated assessment for sardine in GSA04, which replaced the assessment presented to the WG. The main difference was that some methodological problems with the use of one of the models initially presented to the WG (Schaeffer production model) were detected, and therefore the new assessment was only based on the alternative model presented to the WG (VIT). In any case the assessment was still regarded as preliminary, as several methodological issues were raised both in the WG and in the SC and the data used was considered incomplete. The SC encouraged continuing working on this assessment in coordination with neighbourhood countries in the Alboran Sea (e.g. Morocco) and in the context of the FAO regional project COPEMED II, and the presentation and discussion of its results in next year Assessment Working Group.

2013 SCSA WORKPLAN

31. The SCSA agreed on the following activities for 2013:
 - A workshop on the definition and estimation of reference points for small pelagics and demersal stocks, in agreement with the GFCM guidelines for management should be carried out. The workshop should also deal with terminology used in advice as well as the clear classification of assessment in relation to its uncertainties and its use to provide advice on the status of the stock (i.e. a revision of the current classification on *preliminary* or *validated* assessment). A proposal was also made that the workshop incorporate hands-on training on the estimation of reference points for selected fisheries, including inter alia the analysis of time series to estimate empirical biomass reference points. The workshop should also tackle the structure of a common template for providing advice on the status of the stock, and should facilitate the preparation of a report on the status of Mediterranean stocks.
 - Interim work from the Secretariat should be done in order to provide the Assessment WGs with an updated version of the Stock Assessment Forms well in advance of the WGs for comments and suggestions from the WG members. The revised stock assessment forms should incorporate the recommendations

from the above mentioned workshop in its section on advise on stock status

- In addition to carrying out the Assessment Working Groups in 2013, the SC proposed that reporting of those WG be accelerated and that a revision group be established to produce a consolidated report to be analysed by the Sub-Committee.

NOMINATION OF SCSA COORDINATOR

32. The GFCM Secretariat and the SC acknowledged and expressed gratitude for the work done by Fabio Fiorentino in the last three years as a coordinator of the SCSA and unanimously elected Mr Francesco Colloca, from the Istituto per l'ambiente marino costiero (IAMC – CNR) as new coordinator of the Sub-Committee.

DATE AND VENUE OF THE NEXT MEETING

33. The date and venue of the next meeting will be decided later on.

ADOPTION OF THE REPORT

34. The general conclusions and recommendations of SCSA were adopted by the SC on 20 February 2013. A complete draft report would be disseminated on the following week to integrate comments and clarifications from the participants on contents other than those agreed and adopted in the meeting.

Table 1 – Assessments for demersal species, as validated by the WG with SC recommendations.

GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 01	European hake (<i>Merluccius merluccius</i>)	Catch, Lfreq catch & trawl surveys	2003-2011	XSA tuned with CPUE from commercial fleet and MEDITS data.	Overfishing	5.4	From a precautionary approach and taking into account the estimated reference points MSY proxies (F0.1, F40%SSB and F30%SSB), a reduction of the current fishing mortality is recommended by reducing the effort activity and improving the selection pattern of the fishery.	The statement “low abundance” is very vague. A quantitative way should be found to support it. Time series are often short and do not provide the appropriate basis to set up a baseline for sound comparison. Assessment and recommendations endorsed	The SC endorses the advice. The SC recommends to improve the exploitation pattern reducing juvenile catches.
GSA 05	European hake (<i>Merluccius merluccius</i>)	Catch, effort, Lfreq catch & trawl surveys	2000-2011	XSA and Y/R analysis	Overfishing	9.2	To reduce fishing mortality. The use of the information from the vessel monitoring system will help improve the knowledge about the spatial distribution of the fishing effort.	It was suggested to include a plot of the spawning stock biomass against recruitment. Assessment and recommendations endorsed	The SC endorses the advice. An extra effort to understand SSB/R relationship is recommended.
GSA 06	European hake (<i>Merluccius merluccius</i>)	Catch, effort, Lfreq catch, trawl surveys	1999-2011	XSA, Y/R analysis, FLR predictions	Overfishing	10.0	A reduction in trawling fishing effort, along with a reduction of gillnet and long lining effort, in the context of a multi-annual management plan taking into account the multi-species landings of the trawl is recommended.	The assessment was found to contain contradictions, as the SSB increased while the recruitment decreased over the studied time period. An explanation to this pattern should be provided. Several checks have been proposed: analyse changes occurring in the fisheries (effort over time for each gear), compare recruitment data to the age 0 MEDITS index, compare commercial CPUEs with MEDITS index and compare the outputs of separable VPA to a classical VPA run. In that context, the statement “low level of SSB” would need further clarifications. Assessment and recommendations endorsed	The SC endorses the advice. The discrepancy between biomass and recruitment, as well as possible confounding signals between the catch by age and the survey at age data should be further investigated.

Appendix A

GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 07	European hake (<i>Merluccius merluccius</i>)	Catch, effort, Lfreq catch, trawl surveys	1998-2011	XSA, Y/R analysis	Overfishing characterized by growth overexploitation with periodically higher recruitments (1998, 2001-2002 and 2007). Since 2007, the recruitment has reached the lowest level of the historical series 1998-2011	11.2	To reduce growth overfishing: - Improve the fishing pattern of the trawl to arise the minimum length of catches equal to the minimum legal landing size; - close nursery areas at least temporarily; - Reduce the effort of trawl, from reducing time at sea, number of fishing boats, engine power, Bollard pull and/or trawl size; To avoid recruitment overfishing: - Reduce the effort of longliners and gillnetters in order to increase (or at least maintain) the SSB; - Establish temporal closures for longliners and gillnetters during the period of maximum spawning (end of autumn and beginning of winter, main peak of spawning period); Freeze of the effort in the Fishery Restricted Area.	Comments such as the one about management measures currently in force (destruction of boats, temporary closures for trawlers, etc.) should be included in the stock assessment forms as well as in the report. It was also suggested to show a plot of the size distributions at least for the last three years, which could help to identify trends as well as a plot of the spawning stock biomass against recruitment. The WG endorsed the assessment and recommendations	The SC endorses the advice. Same problems on the SSB and R relationships as in other hake stocks exist.
GSA 12, 13, 14, 15, 16	European hake (<i>Merluccius merluccius</i>)	Catch & Lfreq catch	2010-2011	LCA, Y/R analysis	Stock is in overfishing status and low abundance. The stock is characterized by growth overexploitation.	3.6	To reach F0.1, current fishing mortality should be reduced by more than 80% in optimistic scenario. - The fishing pattern is essentially oriented to the juvenile fraction, so to reduce growth overfishing, management of this species should be oriented towards increasing direct and indirect selectivity pattern of the trawl in order to increase the minimum length of catches up to the minimum legal landing size. - Reduce the effort of trawlers targeting especially the juvenile fraction of the stock, from reducing time at sea, number of fishing boats, engine power. - It is not excluded that the stock is shared with adjacent subareas so it is recommended to proceed to joint assessment integrating CopeMed Area.	Since two growth hypotheses are presented, the choice between both is not clear. It was suggested that the hypothesis with a higher L could be favored. The WG considered this assessment preliminary because of the shortness of the time series considered. Two years of data were available.	SC does not comment the advice since the assessment is considered preliminary. The SC appreciated the effort to develop a joint international assessment under the MedSudMed project framework.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 18	European hake (<i>Merluccius merluccius</i>)	Catch, effort, Lfreq catch, trawl surveys	1996-2011	SURBA, Y/R, LCA	The stock is in overfishing and thus it is necessary to consider a considerable reduction of the fishing mortality to allow the achievement of F0.1	4.4	Consider a remarkable reduction of the fishing mortality. The reference point F0.1 can be gradually achieved by multiannual management plans that foresee a reduction of fishing mortality through fishing limitations. As observed in 2011, the fishing mortality from the Italian bottom trawlers represents about 80% of the total F in the GSA and that of the Italian longlines is accounting for about 9.5%, with an overall percentage of about 90%, while Montenegrin trawlers account only for about 1% of the F exerted on hake in the GSA and Albanian trawlers of about 9.7%. Moreover, the production of hake in GSA 18 is split in 12.5% caught by Italian longlines, 77.2% by Italian trawlers, about 1% by Montenegrin trawlers and about 9.4% by Albania trawlers.	The WG endorsed the assessment and recommendations	The SC endorses the advice. The SC appreciated the effort to develop a joint international assessment under the AdriaMed project framework.
GSA 01-03	Blackspot seabream, <i>Pagellus bogaraveo</i>	Lfreq catch	2009-2011	LCA and Y/R analysis	Stock is in overfishing status (F _c =0,194 higher than F0.1=0.113 and F40%MSY=0.120) and overexploited (MSY=331 t lower than Y at F0.1=473 t and Y at 40%=481 t).	1.7	Reduce the effort level to set the fishing mortality level to a more sustainable value. Rationalize the management of this resource by establishing similar management measures in both countries (Morocco and Spain).	Three scenarios on F _{terminal} were presented for the VIT analysis. The rationale behind the choice of the retained F _{terminal} could be stated more clearly, even though results were qualitatively similar. It was also recommended to compare the reference points obtained by the Yield per recruit approach with those obtained from the three scenarios using VIT. Finally, it was noted that overexploitation should be assessed based on biomass. The WG endorsed the assessment and recommendations.	The SC endorses the advice. In order to assess if the stock is overexploited the SC recommends to estimate BMSY instead of catch at MSY to be compared with the current stock biomass. Clarification on the methods applied (i.e. DCAC model), terminology and data used for the assessment is required. The SC appreciated the effort to develop a joint international assessment under the Copemed project framework.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 15-16	Common Pandora, <i>Pagellus erythrinus</i>	Trawls surveys, catch & Lfreq catch	2006-2011	LCA, XSA and Y/R analysis	Overfishing. As a consequence F needs consistent reduction from the current F towards the candidate limit reference point for long term sustainability based on F0.1.	2.4	Based on the results of the XSA performed, a reduction of about ~60% of the fishing mortality is needed to reach the technical target reference point F0.1; at present both SSB and recruitment show clear decreasing trends. A progressive reduction of current F through consistent effort reduction and an improvement in current exploitation patterns are recommended. In this context a multi-annual management plan to be implemented at GSA 15 and 16 taking into account the effects of the different gears targeting different life stages of common Pandora is advisable.	The VIT analysis showed an anomaly in 2009. The origin of this anomaly should be explained, and also why this anomaly has not been observed when running the XSA analysis. In addition, the XSA analysis was applied on 6 years data while the maximum age was 7 years, which does not allow the analysis to cover a complete cohort. At least 7 years should be needed to an adequate XSA run. The VIT analysis has been applied on single years, while the GFCM recommendations specify that years should be lumped together when using this approach. This remark was also addressed at the end of the sessions and a general recommendation is done in the last section of this report. The sensitivity of the results to the use of yearly or lumped data should be tested	The SC endorses the advice. The SC recommends to better explain the approach used to estimate Reference Points for the stock. Some of the parameters included in the individual report and the Stock Assessment Form need to be checked.
GSA 17	Common sole, <i>Solea solea</i>	Trawls surveys, catch, Afreq catch & Lfreq catch	2004-2011	XSA, Surba, SS3, VIT	Overfishing. Current F (2011) estimated with different model comprised between 0.73 and 1.43 and higher than the proposed reference point (F0.1 = 0.26 as a proxy of FMSY).	5.5	A reduction of fishing pressure would be recommended, also taking into account that the exploitation is mainly orientated towards juveniles and the success of recruitment seems to be strictly related to environmental conditions. This could be achieved by a two-months closure for rapido trawling inside 11 km (6 nm) offshore along the Italian coast, after the fishing ban. Moreover, information provided by VMS will be useful in order to quantify the fishing effort of rapido trawlers in such area and period. Finally, specific studies on rapido trawl selectivity are necessary. In fact, it is not sure that the adoption of a larger mesh size would correspond to a decrease of juvenile catches. The same uncertainty regards the adoption of square mesh.	The group considered the use of the SS3 method as a good initiative. Comparisons of outputs with classical approaches should be done.	The SC endorses the advice on stock status. The purposes of the associated management recommendations from the WG are however not completely explained in the text, therefore the SC recommends to incorporate all information that leads to the recommendation in future reports.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 05	Striped red mullet, <i>Mullus surmuletus</i>	Catch & trawl surveys	2000-2011	XSA and Y/R analysis	Overfishing	3.1	To reduce fishing mortality. The use of the information from the vessel monitoring system will help to improve the knowledge about the spatial distribution of the fishing effort.	No particular comment. Assessment and recommendation endorsed	The SC endorses the advice. The recommendation to use VMS for the assessment/management of the stock is not sustained in the assessment sheet presented to the WG. The SC recommends to incorporate all information and discussion that lead to the recommendation given in future reports.
GSA 07	Red mullet, <i>Mullus barbatus</i>	Trawl surveys	2004-2011	XSA, Y/R	Overfishing (high fishing mortality and intermediate abundance) with periodically higher recruitments (2006 and 2010)	2.5	Reduce effort of trawl, by reducing the time at sea, the number of fishing boats, the engine power, the Bollard pull and/or trawl size.	No particular comment. Assessment and recommendation endorsed	The SC endorses the advice on stock status. The SC recommends to modify the management advice as follows: "reduce fishing mortality by means of effort and catch limitations".

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 15-16	Red mullet, <i>Mullus barbatus</i>	Trawls surveys, catch, Afreq catch & Lfreq catch	2006-2011	VIT XSA tuned by MEDITS SURBA	The WG proposed F0.1 = 0.45 as proxy of FMSY and as the exploitation reference point consistent with high long term yields. Taking into account the results obtained by the XSA analysis (current F0-4 is around 1.3), the stock is considered in overfishing.	2.9	Reduce the relevant fleets' effort and/or catches until fishing mortality is below or at the proposed FMSY level, in order to avoid future loss in stock productivity and landings. This should be achieved by means of a multi-annual management plan taking into account mixed-fisheries considerations. The current high discarding rate of juveniles of the 0 group needs to be reduced by improving the trawl net selectivity (i.e. adoption of sorting grids) and through the reduction of fishing effort on the continental shelf in autumn.	The discussion was focused on the identification of stock units in the Strait of Sicily. Red mullet is a typical coastal resources, the peculiarity of the Strait of Sicily (two shelves - the European and the African ones-separated by narrow deep bottoms) supports the hypothesis of the existence of different subpopulations in the area and thus the occurrence of a stock unit confined in GSAs 15 and 16. The WG discussed the recent change in the exploitation pattern of the trawl fleet of the 12-24 m LOA which can justify the observed decline in fishing mortality in recent years. SURBA displayed an increase in biomass, but the analysis showed a general decrease in the stock. It was noted that the survey data has a longer time extent that allowed to display a long-term increase, whereas the analysis captured a short-term decrease. It was suggested to consider the reference in time-scale. The WG endorsed the assessment and recommendations.	The SC endorses the advice.
GSA 07	Black-bellied anglerfish, <i>Lophius budegassa</i>	Trawls surveys, catch, Afreq catch & Lfreq catch	2009-2011	LCA/XSA	Following the Y/R methodology, in 2011 F0.1=0.292 and F2-4=0.972, the stock seems to be in an overexploitation status, but this assessment was considered preliminary.	3.3	The assessment is considered preliminary. Hence, no management advice can be given	The authors wanted to keep this assessment as preliminary although 3 years of VIT analysis was considered enough to accept the assessment. However, because of the lack of information on biological parameters and fisheries independent data, this assessment was kept preliminary	The SC does not comment the advice since the assessment is considered preliminary.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 15-16	Black-bellied anglerfish, <i>Lophius budegassa</i>	Trawl surveys & Lfreq catch	2002-2011	LCA, VIT , Surba	F0.1 = 0.16 was proposed as proxy of FMSY and as the exploitation reference point consistent with high long term yields. Taking into account the results obtained by the VIT analysis (current F1-7 is around 0.30), the stock is considered in overfishing.	1.9	Based on the results of the VIT, the WG recommends the relevant fleets' effort or catches to be reduced until fishing mortality is below or at the proposed FMSY level, in order to avoid future loss in stock productivity and landings. This should be achieved by means of a multi-annual management plan taking into account mixed fisheries considerations	A good consistency was noted between the F estimated by VIT and those by Beverton and Holt mortality estimator. It was also noted that Fmax is not a very reliable reference point as it is hard to estimate. The SURBA run was not found satisfactory, as a large uncertainty was observed. The WG endorsed the assessment and recommendations.	The SC endorses the advice.
GSA 26	Brush tooth lizard fish, <i>Saurida undosquamis</i>	Lfreq catch	2002-2012	LCA, Y/R	The results (the current fishing level of the lizard fish is higher than the biological reference points (F0.1 and Fmax)) indicating that the stock is overexploited.	2.0	Reduce the fishing mortality to F0.1 by limiting fishing activities. Improve the selection pattern of the trawl fishery.	Two different methods were used to estimate natural mortality. It was noted a small difference between the natural mortality for age 1 and the last age. Since this assessment is new, it was suggested to use a broad range of methods to test how M estimates vary. It was also suggested to look into separating the artisanal fisheries. The WG endorsed the assessment and recommendations.	Given that only one year of data is available the SC considers this assessment as preliminary.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 05	Red shrimp, <i>Aristeus antennatus</i>	Catch, trawl surveys, Afreq catch & Lfreq catch	1992-2011	LCA, XSA, VPA, Y/R	The stock is subjected to overfishing.	3.9	To reduce fishing mortality. A possible management measure would be protecting the recruitment, by reducing temporarily fishing time during the recruitment period at the beginning of autumn.	From the time series the stock seems to be in a low abundance period. As $F > F_{0.1}$, the management recommendations should be reducing the fishing mortality. The WG endorsed the assessment and recommendations.	The SC endorses the advice. The effect of differences between males and females in biological parameters and catchability should be further evaluated and discussed in the report. Also potential issues on stock unit between GSA05 and 06 should be investigated.
GSA 06 (partial : Catalonia only)	Red shrimp, <i>Aristeus antennatus</i>	Catch & Lfreq catch	2008-2010	VIT year by year	The stock appeared to be subject to overfishing in all the years assessed, with current values of F (F_c) above the reference point $F_{0.1}$.	2.4	Basing advice on the evaluation of females, which made up for 81% of the catches, decrease the fishing mortality of 59% in order to reach the reference point $F_{0.1}$ level (this percentage was calculated using the average value of F_c and $F_{0.1}$ for the three years assessed).	The WG questioned the reasons of performing two different assessments for the same area. The differences between both assessments are: (i) CSIC assessment covered 2008- 2010, and length sampling and landings only from Catalonia (GSA 06 North) and (ii) IEO assessment covered 1992-2011, length sampling from the South of the GSA, landings and surveys abundance indices from all the GSA (both North and South). Although IEO also has length sampling information from the North, it only covered recent years (from 2007), so these data were not included in this assessment, although they would be included in the future. It should be important to compare the information from the north and the south: growth parameters, size composition and landing patterns. If they are very different, it would make sense to perform two assessments separately. If not, a single assessment for the entire GSA 06 should be presented. For nursery areas: It is assumed that a great part of the recruitment is in inaccessible areas for the fleet, so it is not necessary to suggest protecting them. F_{max} as reference point should be avoided and the use of $F_{0.1}$ is recommended. As $F_c > F_{0.1}$, the stock is in overfishing situation. Thus, a reduction of F should be proposed. The WG endorsed the assessment and recommendations.	The SC endorses the recommendation to combine all data for this stock in GSA 06 in a single assessment. Also potential issues on stock unit between GSA05 and 06 should be investigated. Reference points should be provided for the stock, and not separated by years, sex and geographical locations.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 06	Red shrimp, <i>Aristeus antennatus</i>	Catch, trawl surveys & Lfreq catch	1996-2011	LCA, YpR and XSA	The stock is in overfishing status. Exploitation rate shows a high F and the stock abundance is considered intermediate (but no reference point for biomass)	2.1	According to Yield per Recruit a reduction of about a 51% in current fishing mortality is needed to reach the level of F0.1.	The WG questioned the reasons of performing two different assessments for the same area. The differences between both assessments are: (i) CSIC assessment covered 2008- 2010, and length sampling and landings only from Catalonia (GSA 06 North) and (ii) IEO assessment covered 1992-2011, length sampling from the South of the GSA, landings and surveys abundance indices from all the GSA (both North and South). Although IEO also has length sampling information from the North, it only covered recent years (from 2007), so these data were not included in this assessment, although they would be included in the future. It should be important to compare the information from the north and the south: growth parameters, size composition and landing patterns. If they are very different, it would make sense to perform two assessments separately. If not, a single assessment for the entire GSA 06 should be presented. For nursery areas: It is assumed that a great part of the recruitment is in inaccessible areas for the fleet, so it is not necessary to suggest protecting them. The WG endorsed the assessment and recommendations	The SC endorses the advice. The SC recommends to combine all data for this stock in GSA 06 in a single assessment. Also potential issues on stock unit between GSA05 and 06 should be investigated.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 01, 03, 04	Deep-water pink shrimp, <i>Parapenaeus longirostris</i>	Trawl surveys & Lfreq catch	2003-2011	Based on LCA , YpR and Schaeffer model.	The stock is in overfishing status. From the first model, the actual level of fishing mortality (Fbar= 1.135) is higher than the values calculated for the FMSY proxy (F0.1 = 0.48). The obtained results from the global model indicate that the deepwater pink shrimp stock is overexploited. Current biomass represents only 11% of the target biomass and the fishing mortality exceeds 2.6 times the target mortality.	2.4	<p>In order to allow for the recovery of the stock, a reduction of 50% of the current fishing mortality in the trawl fisheries targeting <i>P. longirostris</i> is recommended.</p> <ul style="list-style-type: none"> - The effort level in the trawl fisheries should be reduced to adjust the current fishing mortality to levels more in agreement with the sustainability values, with F0.1 as reference point (Schaeffer model). - According to the projection coming from the production model, the reduction of the fishing mortality (F) at the mentioned level could enable the recovery of the <i>P. longirostris</i> stock in 4-5 years. - Data from Algeria and Morocco on length-frequency distribution at landing are necessary and should be provided for the next year to improve the joint database used in the analyses carried out by the SG, with partial support of CopeMed II if necessary. 	Production model has been applied to a very short data series, which does not reflect the oscillations characteristic of a longer period. However, as the landings are not very flat, the results could be considered quite reliable. The WG endorsed the assessment and recommendations. Discussion about the production model.	The SC endorses the advice. Further research on differences in exploitation pattern, biological characteristics and migration rates between the different GSA areas is recommended. The SC appreciated the effort to develop a joint international assessment under the Copemed project framework.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 06	Deep-water pink shrimp, <i>Parapenaeus longirostris</i>	Catch, trawl surveys & Lfreq catch	2001-2011	Based on LCA and YpR.	Overfishing.	3.2	From a precautionary approach and taking into account the estimated reference point FMSY proxy F0.1, a reduction of fishing mortality about 70% to reach F0.1 is recommended. The deep-water pink shrimp fluctuations found in the GSA 06 are in agreement with that observed in other areas of the Mediterranean and it is assumed that environmental conditions can affect the stock in addition to fishing mortality.	No particular comment, assessment and recommendations endorsed	The SC endorses the advice. The SC recommends to improve the terminology used in the assessment and advice.
GSA 12-16	Deep-water pink shrimp, <i>Parapenaeus longirostris</i>	Catch, trawl surveys & Lfreq catch	2007-2011	LCA and preliminary XSA with 5 years of data. Landing of 3 countries involved in the assessment. Comparison of VIT year by year.	The WG proposed F0.1 = 1.22 as proxy of FMSY and as the exploitation reference point consistent with high long term yields. Taking into account the results obtained by the LCA analysis (current F0-3 was around 1.5-1.6 in 2010 and 2011), the stock is considered in overfishing	1.3	Maintaining the current exploitation pattern, characterized by high catches of undersized shrimps from small trawlers, and considering F0.1 as target reference points, a reduction between 20 and 28% was recommended. An improvement of exploitation pattern of Italian small trawlers is needed. To contribute to this objective the protection of nurseries areas from towed gears was recommended	The sensitivity analysis for different shrinkages showed great differences for FBAR. Low shrinkage values constrain a lot the data to the tuning data series. Also, the shrinkage years are too large (5), so this should be improved. A longer time series of data is needed to improve the performance of XSA. The opportunity to use the standardized abundance indices from trawl surveys to make more robust the conclusion of the assessment was outlined. The results of intercalibration experiment, carried out in July 2011 in the Strait of Sicily within the framework of the MedSudMed project, to standardize the catch rates of Tunisian vessel with that used in Italian and Maltese trawl surveys, make possible to assess stock dynamics including spatial aspects over the whole area of distribution of the stock. The WG endorsed the assessment and recommendations.	The SC endorses the advice. Since the F _{0.1} value seems higher than in other GSAs, the SC recommends to investigate the effect of the method applied (i.e combining LCA and Y/R estimates obtained for each sex separately) on the F ₀₁ calculation. The SC appreciated the effort to develop a joint international assessment under the Copemed project framework.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 18	Deep-water pink shrimp, <i>Parapenaeus longirostris</i>	Trawl surveys, catch & Lfreq catch	2008-2011	VIT and R-routine for medium term	Overfishing	2.1	The BRPs can be gradually achieved by multiannual management plans requiring a more sharp reduction in the short term than in the medium term. However, a more gradual reduction will very likely imply lower social and economic costs, without hampering the sustainability objective. The objectives of a more sustainable harvest strategy could be achieved with a multiannual plan based on a reduction of fishing mortality through fishing activity limitations and possibly fishing capacity decreasing. It is however necessary to consider that most part (71%) of the total F in the GSA is exerted by the Italian fleet, while Montenegrin trawlers account only for about 1.7% of the F exerted on the GSA and Albanian trawlers of about 27.1%. Contribute of each country to the total production in the GSA 18 is: Italy 71%; Albania 26%; Montenegro 3%.	The discussion highlights that when the time series of landings is short and tools as VIT are used the application of the model year by year, as performed in this assessment, is preferable. The effects on catches of the reduction scenario in the medium terms would improve if also the beneficial effect on the spawning stock biomass was incorporated. It is important to receive by the relevant Committee and experts also economic considerations on the forecasts performed under different management scenarios. The WG endorsed the assessment and recommendations.	The SC endorses the advice.
GSA 05	Norway lobster, <i>Nephrops norvegicus</i>	Catch & Trawl surveys	2001-2011	XSA and YpR.	Overfishing	3.2	To reduce fishing mortality. The use of the information from the vessel monitoring system will help to improve the knowledge about the spatial distribution of the fishing effort.	Current value of F has been pointed out as intermediate when compared with last year, in which it showed a maximum. However, last year F is a very unstable estimation; there is some uncertainty, so it was proposed to use last 2-3 years to make the comparison. Results from the retrospective analysis show that F estimations are not very stable. For this reason, the WG proposed to take the results of this assessment with caution. The WG endorsed the assessment and recommendations	The SC endorses the advice.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 17	Mantis shrimp, <i>Squilla mantis</i>	Catch, trawl surveys & Lfreq catch	2007-2011	VPA, Y/R	Overfishing. Current F (2011) estimates with VIT model and separable VPA respectively of 0.93 and 1.00, higher than reference point (F0.1 = 0.50 as a proxy of FMSY). Moreover the decreasing trends observed for recruitment and SSB in the VPA results and for relative abundance and biomass in MEDITS survey, have to be taken into consideration as a state of stress of the stock.	1.9	A reduction of fishing pressure would be recommended. The relevant fleets' effort or catches (demersal otter trawl fishing fleet) should be reduced until fishing mortality is below or at the proposed reference level (F0.1), in order to avoid future loss in stock productivity and landings. This should be achieved by means of a multi-annual management plan taking into account mixed-fisheries considerations.	No specific comments. Assessment and recommendations endorsed	The SC endorses the advice.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 29	Spiny/Picked Dogfish, <i>Squalus acanthias</i>	Catch, Lfreq catch & trawl surveys	1989-2011	VIT and YpR from NOAA.	In the last 20 years the stock biomass has shown a decrease of an order of magnitude, but the exact amount is uncertain. We estimated F0.1 = 0.227 (FMSY proxy) as a limit reference point consistent with high long term yields and low risk of fishery collapse for dogfish in the Black Sea. Taking into account that the current F = 0.262 the stock is considered to be overexploited	1.2	<p>Gaps that need to be addressed in the near future include:</p> <ul style="list-style-type: none"> - Low quality of the input data for assessments (in terms age and size composition, fishing effort, CPUE and research surveys); - The lack of quality survey information deteriorates the estimates of the current population parameters (abundance and mortality) in stock assessments and decreases the reliability of the short term predictions and management advice; - Insufficient knowledge of stock units; - Lack of knowledge, evaluations and monitoring programs for assessing the IUU and discards;Lack of reliable frameworks of assessing and standardizing of the commercial fleets fishing effort and CPUE <p>Management advice and recommendations</p> <ul style="list-style-type: none"> - Reducing fishing mortality; - Improve selection pattern; - Close spawning seasons in spring and autumn; - Obligation for pregnant females to be discarded; - Regional management measures 	It is noted that enough data seems to be available to carry out a run using VPA, or at least to run VIT on a yearly basis. It was also noted that this species seems to undergo a sharp decrease that does not translate very clearly on the yield per recruit diagram. The problem of the estimation of age has been raised as well as the difference in methodology with neighbouring countries, which makes difficult the use of data. The WG endorsed the assessment and recommendations	The correct terminology for the conclusion related to higher Fcurrent than the F reference point is that the stock is under overexploitation. However, the SC also endorses that the stock is overexploited, based on a clear decreasing trend in abundance. Notwithstanding the endorsement, the SC recommends to revise the assessment method avoiding to use VIT for this stock. Virtual population methods (e.g. VPA, XSA) appear more appropriate since a long time series of catch data is available for this stock. The SC recommends also to improve standardization of aging procedures in the region. In terms of management considerations, the SC advises to adopt the GFCM2012/3 recommendation on the protection of coastal sharks.

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GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 29	Whiting, <i>Merlangius merlangus euxinus</i>	Catch, Lfreq catch & trawl surveys	2000-2011	YPR-LEN	Overfishing: estimated $F = 0.375$ exceeds $FMSY = 0.352$. Given that this is not a highly migratory species we may conclude that the resident population is more exploited in the southern part (Turkish waters) than in the rest of the Black Sea. If we consider the recommendation of the EWG 12-16 as $FMSY = 0.4$, the two results obtained by us, $F_c(2011) = 0.375$ and $F_c(2000-2011) = 0.479$ oscillate around of the value of $FMSY = 0.4$. In this case, we can consider that the stock is fully exploited. Terminology not consistent but overfishing is identified.	1.1	Reduce fishing mortality; Improve selection pattern; Regional management measures; Organize workshop(s) for inter-calibration of age readings between scientists in the region, and harmonize the frameworks and methods of sampling of commercial fisheries and scientific surveys	It was noticed that the discards for this species were very high. The WG endorsed the assessment and recommendations	The SC acknowledges uncertainties in the stock advice in relation to exploitation rate for this stock, in agreement with the WG comments. The SC advises on the necessity to adopt a unique $FMSY$ value to be used to assess the stock in assessment groups from different Organizations (e.g. STECF EWG versus GFCM SCSEA-WG demersals). The SC endorses the recommendation on harmonization of management and data regulations among countries. The SC recommends also to adopt management measures aimed at minimize discards

Appendix A

GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA29	Turbot, <i>Psetta maxima</i>	Catch & Afreq catch	1970-2010	Extended Survivors Analysis (XSA) under FLR and the technique “shrinkage to the mean” was applied for 1970-2010. Yield per Recruit method was applied for long term predictions	Stock is in overfishing and considered to be overexploited (but not formal biomass reference point). Relative stock size indices from surveys and two XSA estimations indicate that the stock is at a historic low which significantly increases the risk of fisheries collapse. Uncertainties regarding the actual landings impose to interpret the XSA assessment results only in relative terms, i.e. they are considered indicative of trends only. Recruitment has increased since 2003 but this has not yet materialized in a significant increase in SSB.	3.5	Reduction of catches to the lowest possible level; Harmonization of management regulations and technical measures between all Black Sea countries in terms of fisheries closures; Harmonize the methodologies and approaches for data collection between coastal states; Estimation of IUU fisheries.	The assessment presented showed many improvements that lead to an in-depth analysis of the state of the stock with long-term historical data. There is some uncertainty on the earlier part of the data, but effort has been invested in gathering the best available data. It has been suggested to include a stock recruitment curve. The choice of biological parameters could be explained in more details. The WG endorsed the assessment and recommendations although it has to be noted that data are up to 2010. 2011 assessment was, according to author, under revision and could not be presented to the WG on time	The SC endorses the advice, given the strong signals from the assessment. The SC recommends that problems in model performance are further investigated in order to improve the quality of the assessment.

Appendix A

GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA 17	Red mullet, <i>Mullus barbatus</i>	Trawl surveys, catch, Afreq catch & Lfreq catch	2006-2011	Length cohort analysis (LCA) and Extended Survivor Analysis (XSA).	F0.1 and Fmax were estimated by the means of a Yield per recruit analysis (YPR) and are equal respectively to 0.234 and 0.408. The Fc is equal to 0.864. The exploitation rate (age 0-4) from the XSA analysis for 2011 is lower than 0.5	3.5	LCA analysis evidenced the different fishing patterns of the two fleets, which is also determined by the behavior of the species. The Italian fleet is clearly targeting recruitment; besides, the Fc for the Croatian fleet is between F0.1 and Fmax while the Fc for the Italian fleet is above both reference points, showing a possible situation of growth overfishing. Nevertheless, an exploitation rate (F/Z) of 0.4-0.5 is on the safer side for a demersal stock. The fishing mortality is high on part of the stock and the biomass trends are rather stable. Taking into account the different exploitation pattern, it could be wise to reduce the fishing mortality on the recruitment and this could be obtained by a prolongation of the closed season for trawling along the Western Adriatic coast where in autumn age 0 recruits born in summer are concentrated.	High fluctuations with exceptional year with very strong recruitment are an established feature of the <i>Mullus barbatus</i> stock in the Adriatic Sea. There is a discrepancy of trends between the XSA results and the MEDITS data on the total biomass estimates and on the SSB estimates: the spawning stock biomass and the stock biomass are decreasing in the last year in XSA, and the recruitment sees an increase in the last couple of years, whilst the signals coming from the MEDITS survey are all positive, with a stable biomass and a really high recruitment estimated for the 2012. Nevertheless, due to the discrepancy between the XSA results and the signals from the MEDITS survey, and due to the uncertainty in the model settings the WG is not able to give advice and this should be considered as a preliminary assessment	Advice is not commented as the stock assessment is considered preliminary. The SC recommends to investigate suitable techniques to improve the knowledge on stock unit. The SC appreciated the effort to develop a joint international assessment under the Adriamed project.

Appendix A

GSA	Species	Data type	Years data	Methodology used	Stock status	Fcurr /F0.1	Management advice	WG comments	SC comments
GSA: 01, 02, 03 and 04	European hake, <i>Merluccius merluccius</i>	Catch, length frequency (catch data, survey data)		For lengthy frequencies (GSA 01+03, period 2007-2010), the methodology applied was the software VIT.	The actual level of fishing mortality ($F_c = 1.148$) is higher than $F_{0.1} = 0.48$ which indicates that the stock is in overfishing status.		<ul style="list-style-type: none"> • To reduce by 50% the fishing mortality in the current trawl fishery.. • To perform joint genetic analysis and research on <i>M. merluccius</i> in Algeria, Morocco and Spain (GSAs 01, 02, 03 and 04) to identify if there is a single common <i>M. merluccius</i> shared stock. • To complete the information on <i>M. merluccius</i> stock in Algerian GSA 04 to join Algerian data to the GSAs 01 and 03 to cover all the study area. • To improve the national database it was stressed that monthly biological data from Algeria and Morocco on length-frequency distribution at landing are necessary for the assessment and should be provided for the next meeting of the SG. If necessary, partial support of CopeMed II could be provide to complete some series. • The organization of a meeting with the Sicily Strait area (CopeMed and MedSudMed SG) to analyze the possibility in comparing the biological and fisheries data and performing a joint evaluation on the <i>M. merluccius</i> stock if possible. • The SG agreed that biological and fisheries data in each country used for the assessment (biological parameters, demographic structure, etc.) should be uploaded to the CopeMed web (Regional Networks and databases). • The next assessment should be based on VPA (not in equilibrium) tuned by effort data from commercial fleets and independent indices from surveys. • To continue working in improving the data to carry out a <i>M. merluccius</i> joint stock assessment before the 2013 meeting of the WG of Demersal Species of the SCSA. 	It has been noticed that growth parameter from Morocco was very low. The WG acknowledged the effort of this joint assessment and endorsed all the research recommendations.	Advice is not commented as the stock assessment is considered preliminary. The SC recommends to investigate suitable techniques to improve the knowledge on stock unit. The SC appreciated the effort to develop a joint international assessment under the Copemed project.

Table 2 – Assessments for small pelagic as validated by the WG with SC recommendations

GSA	Species	Methodology used	Stock status	Management advice	WG comments	SC comments
Combined GSA 01, GSA 02, GSA 03 and partially GSA 04 - Alboran Sea	Anchovy, <i>Engraulis encrasicolus</i>			This stock is not considered to be formally assessed	This assessment exercise was carried out by a COPEMED II Study Group. The WG endorsed the SG recommendations to improve data collection and to test bioeconomic models in this fishery.	SC does not comment the advice as the stock is considered not to be formally assessed. The SC appreciated the effort to develop a joint international assessment under the COPEMED II project framework.
Combined GSA 01, GSA02 and GSA 03 - Alboran Sea	Sardine, <i>Sardina pilchardus</i>	VIT	High exploitation rate: average operating E is estimated at 0.43 (slightly higher than the threshold value $F/Z = 0.4$ as suggested biological reference point for small pelagic (Patterson, 1992)). Stock is in overfishing	Preliminary assessment: no advice can be provided.	The WG informally propose to reduce the level of fishing mortality by 30%. However, the assessment is considered preliminary so no formal advice is provided. The WG endorsed the COPEMED SG recommendations on continue standardization of the methods used in the different countries.	SC does not comment the advice as assessment is considered preliminary. Some clarification on the methodology and the reference points used is required for future assessment. The SC appreciated the effort to develop a joint international assessment under the COPEMED II project framework
GSA 04 – (only Alboran Sea area)	Sardine, <i>Sardina pilchardus</i>	Shaefer model and a preliminary length cohort analysis with VIT.	Fully exploited.	Preliminary assessment: no advice can be provided.	The WG recommends continuing with this exercise and combining the data of the Alborán Sea into a joint assessment.	SC does not comment the advice as assessment is considered preliminary. An updated assessment using only VIT was presented to the SC. The SC regards this assessment as preliminary and suggests continuing efforts to improve data and methods used.
GSA 07 - Gulf of Lion	Sardine, <i>Sardina pilchardus</i>	Direct method by acoustics and CPE	Very Low exploitation rate. Fully exploited with no room for further expansion.	Fishing mortality is already low and shouldn't increase until the stock recovers	The WG acknowledge that recruitments since 2008 are the highest of the 2001-2012 available time series, while the adult biomasses between 2008-2011 are the lowest ones in the same time series, indicating that recruitment is not incorporated into adult population. The WG recognised that 2012 show a larger biomass than that observed since 2008,	The SC understands the difficulties in applying the stock status advice terminology for this stock (very low fishing pressure and abundance possible related to ecological reasons). However the SC recommends to use the word Collapsed to describe this stock. The advice should therefore be to reduce or close the fishery until recovery. Clarification on the biomass used to obtain Harvest rates is

Appendix A

GSA	Species	Methodology used	Stock status	Management advice	WG comments	SC comments
					and. However, the WG recommends that this trend has to be confirmed in next years before it can be considered into the advice on stock status.	required for future assessments. A recommendation to test the feasibility to use analytical methods to facilitate the advice is made.
GSA 07 - Gulf of Lion	Anchovy, <i>Engraulis encrasicolus</i>	Direct method by acoustics and CPUE	Low exploitation rate and fully exploited, low commercial-sized anchovy abundance	Fishing mortality should not be allowed to increase	Although biomass is more or less stable in this stock since 2005, with a slight increasing trend, anchovy sizes remains low in comparison with years previous to 2005.	The SC endorses the advice on stock status. The SC understands the difficulties in applying the stock status advice terminology for this stock (very low fishing pressure and abundance possible related to ecological reasons). A recommendation to test the feasibility to use analytical methods to facilitate the advice is made.
GSA 16 – Southern Sicily	Sardine, <i>Sardina pilchardus</i>	Harvest Rate and Surplus production model (BioDyn)	Low to moderate exploitation rate (harvest rate = 11.9%). Sustainable exploited with a low abundance, slightly increasing in the last years	Fishing mortality should not be allowed to increase	The WG informs that there are market constraints that control the main target of the pelagic species fishery, but also due to the multispecies characteristics of the fishery, a common management may be needed.	The SC endorses the advice. The SC recommends to use the analytically derived reference points (MSY related reference points) to provide advice on the status of this stock until further research on empirical precautionary reference points is conducted.
GSA 16 – Southern Sicily	Anchovy, <i>Engraulis encrasicolus</i>	Harvest Rate and Surplus production model (BioDyn)	High exploitation rate. Overexploited status.	Fishing mortality should be reduced by means of a multi-annual management plan until there is evidence for stock recovery	The WG informs that there are market constraints that control the main target of the pelagic species fishery, but also due to the multispecies characteristics of the fishery, a common management may be needed.	The SC endorses the advice. The SC recommends to use the analytically derived reference points (MSY related reference points) to provide advice on the status of this stock until further research on empirical precautionary reference points is conducted.
GSA 17 – Northern Adriatic Sea	Sardine, <i>Sardina pilchardus</i>	VPA, ICA and acoustic survey	Exploitation rate is higher than the Patterson's reference point (E=0.52). Fully exploited with no room for further expansion	Fishing mortality should not be allowed to increase	WG recognised that spatial distribution of shared stock of sardine is not limited to GSA17 area only, but it is extended in GSA18 area also. Therefore, WG suggest that future assessments try to take into account combined data from these two GSAs.	The SC endorses the advice. The SC highlights that there has been a strong increase in F against previous recommendations from the SAC. The SC recommends that biomass reference points should be revised. As this is a multispecies fishery, advice should be done together with anchovy in GSA 17

Appendix A

GSA	Species	Methodology used	Stock status	Management advice	WG comments	SC comments
GSA 17 – Northern Adriatic Sea	Anchovy, <i>Engraulis encrasicolus</i>	VPA, ICA and acoustic survey	Moderate exploitation rate (E = 0.4). Sustainably exploited.	Fishing mortality should not be allowed to increase	WG recognised that spatial distribution of shared stock of anchovy is not limited to GSA17 area only, but it is extended in GSA18 area also. Therefore, WG suggest that future assessments try to take into account combined data from these two GSAs.	The SC endorses the advice. The SC highlights that there has been a strong increase in F against previous recommendations from the SAC. The SC recommends that biomass reference points should be revised. As this is a multispecies fishery, advice should be done together with sardine in GSA 17
GSA 18 – Southern Adriatic Sea	Anchovy, <i>Engraulis encrasicolus</i>	DEPM	Since this is just a preliminary estimation it is not possible to diagnose the status of the anchovy stock in GSA 18 based on the DEPM investigation.	This stock is not considered to be formally assessed	Low fishing pressure in eastern GSA 18, specially in Montenegro. Higher fishing pressure in the western GSA18, although part of the fleet also operates in GSA17. The WG recommends to continue with both Acoustic and DEPM direct estimation methods, while improving the quality of the landings data in order to estimate an exploitation rate	SC does not comment the advice as the stock is considered not to be formally assessed.
GSA 29 – Black Sea	Sprat, <i>Sprattus sprattus</i>	ICA	Moderate exploitation rate. Sustainably exploited	Status quo exploitation for 2012 which implies catches of 100000 tons not to be exceeded	This assessment has previously being presented to an STECF EG.	The SC endorses the advice.
GSA 29 – Black Sea	Horse mackerel, <i>Trachurus mediterraneus ponticus</i>	Separable VPA	Uncertain exploitation rate. High fishing mortality, but exploitation rate is uncertain	Preliminary assessment: no advice can be provided.	The WG recommends to continue efforts to develop joint surveys, regional coordination in the sampling process and development of a fishery information system	SC does not comment the advice as assessment is considered preliminary. The SC endorses the WG recommendations to improve data collection for this stock.

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**14th Session of the
Sub-Committee on Stock Assessment (SCSA)**

FAO HQs, Rome, Italy, 18-20 February 2013

Chair: Fabio Fiorentino

ADOPTED AGENDA

WORKING HOURS

Morning: 09.00 - 13.00 hours

Afternoon: 14.30 - 17.30 hours

Monday 18th

1. General transversal session (09:00 – 11:00)

1.1. Opening and arrangement of the meetings

1.2. Introduction of on-going activities under the 1st phase of the GFCM Framework Programme (FWP), including on:

1. Strengthening data collection and submission frameworks
2. Implementation of the GFCM guidelines on management plans
3. Concerted action to assist Lebanon for the implementation of FWP activities

1.3. General discussion

11:00 – 11:30 Coffee break

11:30 – end of meeting: Individual subcommittees

2. Adoption of the SCSA agenda

3. Review of new stock assessments and related scientific advice (as validated by the Working Groups on stock assessment)

3.1. Demersal species

3.2. Small pelagic species

Tuesday 19th

4. (Cont') Review of new stock assessments and related scientific advice (as validated by the Working Groups on stock assessment)

4.1. Demersal species

4.2. Small pelagic species

4.3. Other relevant work

4.3.1. Maria Teresa Spedicato: BEMTOOL

4.3.2. Ernesto Jardim: The "Assessment for All" (a4a) modeling initiative

Wednesday 20th

5. General transversal session (08:45 – 09:30)

5.1. Discussion on artisanal fisheries issues

6. Emerging methodological issues

6.1. Reference points; nomenclature, criteria and estimation methods

6.2. New stock assessment forms, including:

- Objectives and contents
- Incorporation of environmental variables
- Summary sheets
- Dissemination and access to the forms

6.3. Publication of a regular report on the status of Mediterranean and Black Sea fisheries

7. Follow-up on:

7.1. Protocol for surveys at sea

7.2. EIFAAC/ICES/GFCM Working group on European Eel

7.3. Planning for stock assessment needs: training, online material, capacity building

8. General conclusions and scientific advice

9. Any other matter

10. 2013 SCSA workplan

11. Nomination of SCSA Coordinator

12. Date and venue of the next meeting

13. Adoption of the report and closure of the meeting