



Scientific Advisory Committee (SAC)

Follow-up workshop on the implementation of management measures in selected case studies in the Mediterranean

GFCM headquarters, 2–3 February 2015

Report

EXECUTIVE SUMMARY

The *Follow-up workshop on the implementation of management measures in selected case studies in the Mediterranean* was attended by 33 experts from ten Member countries as well as representatives of the FAO regional projects and the GFCM Secretariat. It was the fifth of a series of actions initiated in 2013 with the support of the GFCM Framework Programme (FWP) that aimed to establish multi-annual management plans in the GFCM area. The goals of this workshop were to: i) review and assess existing national management measures in two specific case studies (fisheries for small pelagic species in the Adriatic Sea and bottom-trawl fisheries for *Parapanaeus longirostris* and associated species in the Strait of Sicily); ii) discuss progress towards management of eel populations in the Mediterranean; and iii) outline methodology for future activities aimed at implementing management plans for Mediterranean and Black Sea fisheries. The workshop compiled a list of national measures related to the two above-mentioned fisheries. In addition, the workshop conducted a preliminary qualitative assessment of the expected effectiveness of nationally-adopted measures aimed at achieving specified goals in both fisheries. During discussion on methodology for future work related to such assessment and to management plans, the workshop highlighted the importance of carrying out technical work regarding the use of quantitative simulation models in assessing potential management measures (including Harvest Control Rules).

OPENING AND ARRANGEMENTS OF THE MEETING

1. Mr Miguel Bernal, GFCM Secretariat, opened the meeting by welcoming participants, presenting the agenda (Appendix A) and outlining the objectives of the two-day workshop. The objectives of the workshop were to:

- i. Follow up on the *Subregional technical workshop on fisheries multi-annual management plans for the western, central and eastern Mediterranean* (Tunisia, October 2013). The subregional workshop was part of efforts to work towards the implementation of management plans in ongoing case studies in the Mediterranean; (the fisheries for small pelagic species in the Adriatic Sea; demersal fisheries in the Strait of Sicily; and eel in the Mediterranean basin) and to provide elements in response to the mandate given by the thirty-eighth session of the Commission (May 2014) to its Scientific Advisory Committee (SAC).

- ii. Devise a roadmap of subsequent actions to be taken in working towards the implementation of management plans. This is to be done through a discussion on the methodologies to be applied and an assessment of potential new case studies to be included.

REVIEW OF THE ACTIVITIES TOWARDS THE IMPLEMENTATION OF MANAGEMENT PLANS IN SELECTED CASE STUDIES

2. The GFCM Secretariat summarized the first phase of activities carried out in 2013–2014 which were carried out in collaboration with the FAO regional projects and were made possible by the support of the GFCM Framework Programme (FWP). This presentation recalled the various recommendations adopted by the Commission since 2011 on the management of red coral, on the fisheries for small pelagic species in the Adriatic Sea and on the turbot fishery in the Black Sea. It was highlighted that the thirty-eighth session of the Commission (May 2014) had reviewed the management plan for small pelagic species in the Adriatic Sea subject of Recommendation GFCM/37/2013/1) while proposals for the management of the demersal fisheries in the Strait of Sicily and the Gulf of Gabès, and for turbot in the Black Sea were also presented. The SAC was requested by the Commission to provide advice on the technical content of those proposals before their adoption. In response to this request, several activities covering the above-mentioned case studies were carried out during the 2014–15 intersessional period.

Fisheries in the Black Sea

3. Two back-to-back meetings took place: the meeting of the Subregional Group on Stock Assessment in the Black Sea (SGSABS) and an *ad hoc* meeting for the management of turbot (Romania, November 2014). These meetings concluded, *inter alia*, that recovery plans should be implemented for turbot (of which the stock status was found to be in “overexploitation” and “overexploited”) and for piked dogfish (which has seen its populations depleted and is considered to be potentially affected by the turbot fishery). These meetings also prepared a detailed proposal for improving the management of turbot in the area, by focusing as a first objective on measures for the reduction of illegal, unreported and unregulated (IUU) fishing. This proposal shall be reviewed by the the Working Group on the Black Sea (WGBS; Georgia, March 2015).

Fisheries for small pelagic species in the Adriatic Sea

4. The Working Group on Stock Assessment for Small Pelagic species (WGSASP) (GFCM headquarters, November 2014), reviewed stock assessments for the fisheries of small pelagic species in the Adriatic Sea. This session reported sardine in GSA 17 as “in overexploitation” (with a biomass above reference point) and anchovy in the same GSA as both “overexploited” and “in overexploitation”. For both species, a reduction in fishing mortality was advised (pending review by the Subcommittee on Stock Assessment (SCSA) (GFCM headquarters, February 2015) and the SAC (FAO headquarters, March 2014). Following on from the WGSASP assessment, the Commission hosted a dedicated meeting on the management of Adriatic small pelagics fishery (November 2014, Rome, Italy). At this meeting, a list of the management measures in place in each of the countries involved in the fisheries was prepared. All items raised by the thirty-eighth session of the Commission with regards to the fisheries for small pelagic species in the Adriatic Sea were addressed on those occasions, with the exception of the socioeconomic implications of management measures and the assessment of national management measures in place.

5. The Secretariat informed the meeting that in line with the mandate given by the thirty-eighth session of the Commission, this workshop should discuss the work to assess national management measures. Meanwhile, the fifteenth session of the Subcommittee on Economic and Social Sciences (SCESS) (GFCM headquarters, February 2015) would look at the socioeconomic implications of management measures. The Secretariat also pointed out that there was still some work to be done on

the technical issues in the management plan for small pelagic species. This work consisted primarily of the following:

- i. revising the stock assessment model to be used;
- ii. adding information on the fisheries for small pelagic species in GSA 18;
- iii. exploring the possibility of carrying out a joint stock assessment for sardine and anchovy in GSAs 17 and 18;
- iv. estimating reference points; and
- v. deciding on the technical properties of the harvest control rules (HCRs) to be used in the management plan.

6. The Secretariat specified that the recommendations made by the WGSASP included potentially elaborating on roadmap for dealing with the above issues during the upcoming intersessional period.

Fisheries for demersal species in the Strait of Sicily: European hake and deep-water rose shrimp

7. The Working Group on Stock Assessment of Demersal species (WGSAD) (GFCM headquarters, November 2014) assessed stocks of the two main fisheries for demersal species in the Strait of Sicily, *Merluccius merluccius* and *Parapenaeus longirostris*. This session concluded that both species were overexploited. However, a decreasing trend in fishing mortality was observed for both stocks. This was attributed to a reduction in fishing capacity and the relocation of some fleets to deeper waters (further offshore). The WGSAD also reviewed the results of two different simulation models (SMART and BEMTOOL); the outcomes of applying SMART suggested that the temporal closure of identified nursery grounds could increase short-term resource abundance and long-term economic yield. Further supporting the idea of closures, a workshop on the conservation of elasmobranchs (France, December 2014) recommended the temporary closure of the Gulf of Gabès as a way to reduce elasmobranch bycatch around the Strait of Sicily. The Strait of Sicily is an important habitat for cartilaginous fish species.

European eel

8. The outcomes of the EIFAAC/ICES/GFCM Working Group on Eel meeting (WGEEL; November 2014, Rome, Italy) were summarized and a proposal for a pilot action towards the assessment of the stock in 2015 was introduced. Participants were invited to provide their feedback on the pilot action proposed by the WGEEL (Appendix G), whilst keeping in mind that a decision would have to be taken on engaging members in this action plan.

Red coral

9. Advancements on the issue of red coral that took place during the WGSAD session were presented during this workshop. The working group reviewed two assessments from selected “data-rich fisheries” and subsequently identified data gaps and needs. The group concluded the following:

- i. Red coral should be added to Group 3 of the priority species under the Data Collection Reference Framework (DCRF);
- ii. efforts to analyze data submitted since 2014 through the template developed by the GFCM Secretariat should continue;
- iii. Data from fishery-independent surveys is indispensable; and
- iv. The workshop supported the concept note presented during the meeting on a proposed cooperative research programme to fill information gaps on red coral.

ASSESSMENT OF MANAGEMENT MEASURES IN SELECTED CASE STUDIES

10. The Secretariat introduced a conceptual methodology for assessing the implications of potential management measures and described the three steps to be taken:

- i. Identification of management measures;
- ii. Definition of the indicators to be used in the assessment; and
- iii. Application of a common methodology to compare the different measures.

11. For step one, it was specified that a number of measures and objectives had already been defined for all the case studies that had been analyzed within the various GFCM activities. More specifically, a number of objectives and management measures for the fisheries of small pelagic species in the Adriatic Sea were already outlined in Recommendation GFCM/36/2013/1. For the fisheries of demersal species in the Strait of Sicily, elements for their management were approved by the sixteenth session of the SAC (Malta, March 2014) and two recommendation proposals that included measures and objectives that addressed these fisheries were put forward at the thirty-seventh session of the Commission.

12. For step two, indicators (biological, ecological, and socioeconomic) that are linked to the objectives of the management plan should be identified in order to evaluate both the impact and the cost-efficiency of the management measures stipulated in a given scenario.

13. For step three, two groups of methods were briefly outlined and commented upon:

- i. **Qualitative methods** – where, based on expert opinions, the effect of management measures under a given scenario can be given a qualitative score, thereby enabling an assessment of the various scenarios based on the aggregated scores. A qualitative assessment serves as useful feedback for the SAC and the Commission and can be useful in identifying the primary characteristics/properties of different management measures. Although this method can be used during a dedicated meeting with relevant experts, it does not provide a precise assessment and is subjective.
- ii. **Quantitative methods** - If adequate information is available, a quantitative method should be carried out since it can provide a more precise assessment.

14. The Management Strategy Evaluation (MSE) general framework was presented. This framework relies on numerical simulations to compare the outcomes of different management scenarios. Participants were informed that various quantitative methods would be discussed in more detail under agenda item 5.

15. Participants agreed that both methods could be useful and complementary. However, where enough data are available, quantitative analysis should be preferred since this would minimize potential bias associated with a qualitative analysis based on experts' knowledge. On the topic of indicators, there was general consensus on the need to identify and separate between indicators of "pressure" and indicators of "state". There was also general agreement on the importance of choosing a limited number of indicators to be used and of management measures to be tested. The need to oversee the effectiveness of measures at the regional level (in addition to the national level) was also mentioned.

Assessment of management measures applied by countries in the fisheries for small pelagic species in the Adriatic Sea and in the fisheries for demersal species in the Strait of Sicily

16. As a first step towards the assessment of management measures, participants agreed to carry out a tentative qualitative assessment of the measures applied by the countries involved in the fisheries for small pelagic species in the Adriatic Sea and the fisheries for demersal species in the Strait of

Sicily. In order to do that, participants first checked a table of national management measures initially prepared by the Secretariat for both fisheries (as included in Appendices C and D). Once the tables were considered to be completed, national management measures were assessed against: i) the objectives of the management plan for the fisheries of small pelagic species in the Adriatic Sea (as per Recommendation GFCM/37/2013/1); and ii) the objectives of the elements for the management of the fisheries for demersal species in the Strait of Sicily (as approved by the sixteenth session of the SAC combined with the objectives of the proposed recommendations for the management of fisheries for demersal species in the Strait of Sicily presented to the thirty-eighth session of the Commission).

17. The indicators to be taken into account for the assessment of management measures against the stated objectives of the fisheries for small pelagic species in the Adriatic Sea were: i) exploitation rate; ii) spawning stock biomass; and iii) fishing capacity. For the fishery for demersal species in the Strait of Sicily, selected indicators were: i) fishing mortality; ii) biomass; and iii) bycatch and discard rates. For each indicator, the following range of scores was proposed: 0 – not effective; 1 – minimally effective; 2 – moderately effective; 3 – highly effective. Experts from the various countries worked together to provide an initial assessment of each country's measures against the objectives and then jointly discussed the results of their assessments. Some of the participants mentioned that since they were representatives of the administration, they would not participate in the assessment. However, they offered to facilitate the process of acquiring any necessary information and/or clarification on the national management measures.

18. After the initial assessment, participants noted that there were differing interpretations of the scores assigned to the indicators by various experts. For example, a number of experts assigned high scores to measures such as mesh size (indicating that they were highly effective in achieving the objectives of the management plans) whereas others assigned low scores arguing that such measures had already been in place for several years and that their contribution to achieving the stated objectives was minimal. Participants noted that part of the reason for such variations in interpretation was that what was being tested here was a single management scenario (i.e., the one corresponding to the status quo; the one that is generated by the current management measures in place in the various countries) as opposed to contrasting scenarios (e.g., the status quo *versus* no control of the fishery, or *versus* stricter rules on fishing gears/fishing effort). Participants agreed that in order to be able to compare the analyses of the various countries, these potential differences in interpretation should be taken into account. The Secretariat agreed to prepare a summary of the assessment of measures applied in the various countries, whilst paying special attention to potential misinterpretations and highlighting potential shortcomings. The summary of the assessment is included as Appendices E and F.

19. Participants agreed that this assessment (provided in Appendices E and F) serves as a useful preliminary analysis for identifying measures that were expected to be more efficient in achieving the objectives included in the analysis. Moreover, participants felt that this analysis would facilitate the possibility of having more complex numerical assessments in the future.

ISSUES RELATED TO THE MANAGEMENT OF EEL FISHERIES IN THE MEDITERRANEAN

20. Ms Pilar Hernández, GFCM Secretariat, presented the outcomes of the preliminary stock assessment carried out during the WGEEL. This assessment analyzed the trends of two primary indicators: recruitment and mortality (due to fishing and other anthropogenic impacts). Despite the positive trend, the current level of recruitment (which was recovering slightly from the historical minima in the 90s) was still not sufficient to compensate for current spawners' escapement. Given that the European eel constitutes a single Atlantic-Mediterranean stock, it is crucial to have data from all subregions in order to gain a more realistic picture of the status of this stock. The data gaps in the Mediterranean region were highlighted and a pilot action was presented (Appendix G). The list of actions proposed to be undertaken within a year were divided in two phases: i) a practical exercise which would support countries in data collection through the use of online tools (this is already underway thanks to residual FWP funds); and ii) initial trials of models for stock assessment.

21. It was specified that the reasons for having designed such a tight roadmap was because the international assessment of the single shared stock was undertaken every three years and the triennial global assessment at the EU level was planned for November 2015. If interested, Mediterranean countries could contribute to this assessment; however, data should be submitted in the standardized format (even minimal datasets). Adaptation of data and models to the data-poor context of the southern and eastern Mediterranean would be ensured within the action plan as a result of the kind collaboration with ICES-Mediterranean experts.

22. Experts from Albania and Montenegro welcomed this roadmap as an opportunity for the two countries to collaborate in advancing the management of eel and joining forces to use funds from existing projects, including the support from regional bodies such as the GFCM and from FAO regional projects such as AdriaMed.

23. Participants noted the importance of the current year in view of the assessment foreseen in 2015 under the EU regulations. They agreed that it was important to involve all countries (with the assistance of the GFCM Secretariat) and that the management of eels should not be left to other international bodies, such as the CITES Secretariat.

24. The decisions to join the WGEEL and to use the remaining funds from the FWP to assist in the collection of eel data were viewed upon very favourably. The Secretariat explained that Members were expected to decide how far they wanted to go with the work on eels, and that, if interested, they would have to continue collecting data, participating in the international assessment and elaborating guidelines for a regional management plan on eel.

25. Some questions still remained about the convenience of adopting the same management objectives and reference points as the EU Recovery Plan EC N0 1100/2007 and on the feasibility/reliability of stock assessment models in a data-poor context. In relation to the former, a decision would have to be made by the Commission on what the objective would be for the management of eels in the Mediterranean. As for the latter, the Secretariat confirmed that the pilot action was intended to provide assistance to the countries willing to participate in the collection of a minimum set of data required for the stock assessment models. The Secretariat also informed participants that these were data-poor models adapted to the Mediterranean, which were already tested within the ICES framework. In this regard, guidelines for data collection and online tools were being developed. It was specified that countries could count on these tools and on the technical assistance of the Secretariat, in collaboration with Italian experts at ICES that were hired for this purpose. It was concluded that Members should make maximum efforts to take advantage of the momentum gained through the close collaboration with ICES and EIFAAC and to contribute to such an important year for the European eel.

NEXT STEPS IN THE ACTIONS FOR THE IMPLEMENTATION OF MANAGEMENT PLANS

26. A presentation was delivered on the importance of HCRs for the management of fisheries. Three other presentations were delivered on the use of various methods for the comparative assessment of management strategies. These presentations were intended to support discussions on future actions and methods to be used for follow-up activities towards the implementation of management plans.

27. The Secretariat delivered a presentation that highlighted the need to formulate appropriate HCRs so that multiannual management plans can be adaptive in responding to changes in the status of the stocks. The different types of HCRs being applied worldwide were briefly summarized. The Secretariat underlined that the SAC should be able to provide advice on the properties of different HCRs that could be of interest to managers, including their ability to meet the objectives, the level of risk that they involved or their expected short-, medium- and long-term socioeconomic implications.

Despite their importance, HCRs had not been often used in the management of fisheries in the Mediterranean. However, they had been incorporated in the only management plan in place within the GFCM. Participants agreed on the importance of using appropriate HCRs and of being able to assess the biological and socioeconomic implications of choosing among various HCRs. Participants suggested that the SAC should arrange *ad hoc* meetings to investigate the characteristics of different HCRs applied to Mediterranean and Black Sea fisheries.

28. The GFCM Secretariat delivered a presentation on ICCAT's use of MSE and HCRs in managing albacore tuna populations¹. This presentation was kindly prepared by Mr Gorka Merino, from AZTI research institute. The presentation emphasized the importance of HCRs but pointed out that various HCRs, as well as any potential alternative management measures should be assessed side-by-side so as to select the measures that are most effective in meeting the management objectives. The presentation described the steps followed at ICCAT for identifying potential management measures in agreement with stakeholders, using MSE to assess the implications of alternative measures and providing information to managers so they can decide on which measures to include in a management plan.

29. Participants pointed out that some initial steps towards the identification of potential management measures had already been carried out for a number of case studies within the GFCM. Moreover, further efforts in identifying potential HCRs and in using a quantitative framework such as MSE to assess alternative management measures should be carried out within the GFCM. Participants also commented that although the MSE was a promising framework, there may not be sufficient information or models may not be sufficiently robust for its implementation in some Mediterranean and Black Sea fisheries. However, the meeting recognized that the lack of sufficient information for the use of quantitative frameworks should not pre-empt the implementation of precautionary management measures in those fisheries.

30. Mr Fabio Fiorentino, IAMC-CNR, presented an application of a spatially explicit bioeconomic model (SMART) for the assessment and management of demersal fisheries in the Strait of Sicily². He highlighted the properties of the model which is based on a spatial partition of total effort and catches in the fishery using information from vessel monitoring systems (VMS) and using neural networks to predict the properties of the fishery one year in the future. The model thus allows testing the short-term effect of management measures such as spatial closures and/or reduction of fishing effort. The model was previously presented to the WGSAD, where it was regarded as an important tool in the identification of potential spatial management measures. However, some shortcomings were also highlighted such as not incorporating existing information from non-European fleets or the limitation of being able to only predict a year ahead of the data. Participants at this workshop agreed on the high potential of the model to assist in the identification of management measures and suggested continuing to work on overcoming some of its shortfalls.

31. Ms Maria Teresa Spedicato presented an example of impact assessment of different management strategies using the BEMTOOL integrated bioeconomic model³. The model is based on a modular approach, using current stock assessment models as the model of the dynamics of the stock, whilst also incorporating models of fleet dynamics and incorporating a module that allows the simulation of recruitment (either based on observed series or on stock-recruitment models). This approach therefore allows simulation of the future dynamics of the fishery under different management scenarios. A subset of this model (ALADYN) is already being used regularly to provide short- and medium-term projections within the WGSAD. Ms Spedicato demonstrated some examples

¹ Kell, L. T., De Bruyn, P., Ruiz, M. S., and Arrizabalaga, H. 2010. *An example of the use of Management Strategy Evaluation for North Atlantic Albacore using Multifan-CL and FLR*. ICCAT Collective Volume of Scientific Papers, 65: 1498–1506.

² Russo T., Parisi, A., Garofalo, G., Gristina, M., Cataudella S. and F. Fiorentino. 2014. *SMART: A spatially explicit bio-economic model for assessing and managing demersal fisheries with an application to Italian trawlers in the Strait of Sicily*. PLoS One 9 (1): e86222.

³ Rossetto, M., Bitetto I., Spedicato M.T., Lembo, G., Gambino, M., Accadia, P. and P. Meliá. 2015. *Multi-criteria decision-making for fisheries management: A case study of Mediterranean demersal fisheries*. Marine Policy 53, 83–93.

of the model being used in a number of fisheries and being used to test a number of potential management measures.

32. Participants agreed that the model could be very useful in providing advice on management measures and highlighted that it would be very important that the management options to be tested and the assumptions to be made are decided upon in GFCM fora. Furthermore, the conclusions of the analysis should be presented to the SAC so it can feed into its advice.

33. Following on from the methodological presentations described above, participants agreed that, whenever possible, numerical simulation models should be used to provide a quantitative assessment of potential management measures, including alternative HCRs. The meeting suggested that specific actions towards obtaining this quantitative assessment should be planned within the remit of the SAC, in collaboration with the FAO Regional Projects, so as to ensure the participation of relevant stakeholders when required. However, participants also highlighted that in some cases further work will be needed before quantitative methods could be applied, and that depending on the situation of the fishery, precautionary management measures may have to be discussed before a quantitative assessment is ready.

34. In addition to methodological aspects of the next steps, participants discussed the possibility to work on other case studies towards the implementation of management plans, in addition to the ones currently being analyzed by the GFCM. Mr Juan Antonio Camiñas, acting as the FAO CopeMed representative, mentioned that further work towards the implementation of management plans in the Alborán Sea will be required, and that both fisheries for small pelagic species and for red sea bream (*Pagellus bogaraveo*) in the area were proposed by the Project as potential case studies. He mentioned that further efforts had been carried out under CopeMed in working towards the joint assessment of red sea bream; therefore, he expected that improved advice on the status of this population would be presented to the SAC which would in turn facilitate further discussions on the management of this fishery.

CONCLUSIONS AND RECOMMENDATIONS

35. In relation to the assessment of national management measures, both related to Adriatic Sea fisheries for small pelagic species and to Strait of Sicily fisheries for demersal species, the meeting applied a qualitative methodology to evaluate the contribution of each management measure to the existing and proposed management objectives. For the former, the evaluation considered the objectives of the management plan adopted by recommendations GFCM/37/2013/1 and GFCM/38/2014/1. For the latter, the evaluation considered the proposed regional objectives and measures elaborated at the *Subregional technical workshop on fisheries multi-annual management plans for the western, central and eastern Mediterranean* and in the proposals for management measures included in Appendix L of the report of the thirty-eighth session of the Commission. Preliminary discussions highlighted some differences in the perception of the effectiveness of management measures among countries and fisheries (e.g., minimum size, MCS, etc.) that needed to be further analyzed and discussed. An initial summary of the assessment at the subregional scale (i.e., for the fisheries of Adriatic Sea small pelagic species and for the fisheries of demersal species in the Strait of Sicily) is included in Appendices E and F.

36. In relation to the roadmap proposed by the WGEEL for 2015 (Appendix G), participants recognized that the list of actions proposed was ambitious and that the calendar of activities was tight. However, they agreed to consider the first phase (that had already started with the help of remaining FWP funds) as a practical exercise for advancing towards a better understanding on the status of the eel stock in the area. This could in fact help countries that are willing to participate in testing the data collection tools and to perform first trials of models with data provided on a voluntary basis. The Secretariat would provide technical assistance and ensure follow-up to the first set of activities in the roadmap.

37. The second phase of the roadmap, including the organization of a two-day dedicated workshop back-to-back with the general EIFAAC/ICES/GFCM WGEEL at the end of October-November 2015 would need the approval of the SAC and would need to be considered by the Commission in light of the necessary budgetary implications. The meeting highlighted the importance of continuing the work towards the production of specific guidelines for the regional management of eel fisheries in the GFCM area, taking into account the existing framework as proposed by ICES and the existing national plans in place in the area.

38. In relation to the methodologies to be used for the assessment of management measures, the meeting considered that, whenever possible, efforts to set up quantitative assessment frameworks (e.g., MSE, BEMTOOL, SMART, etc.) should be undertaken. The meeting considered that the qualitative assessment of management measures which was initiated during the meeting could be useful as a first step in identifying the most effective measures and facilitating the construction of management scenarios to be tested in quantitative frameworks. The meeting highlighted the potential of quantitative assessment frameworks in testing both potential management scenarios and HCRs, and also highlighted the importance of including biological, ecological and socioeconomic indicators in the assessment.

39. The meeting underlined that it would be important to outline a procedure for how to incorporate the assessment of the impact of management measures into the SAC advice, taking into account the multi-disciplinary nature of the activity (e.g., incorporating socioeconomic, environmental and biological aspects) and also the need to incorporate managers' and stakeholders' views on the definition of potential management scenarios.

40. In relation to the HCRs included in Recommendation GFCM/37/2013/1 on the management of small pelagic species in the Adriatic Sea, the meeting concluded that a comprehensive evaluation of the effectiveness and consequences of the current or any alternative HCR should be carried out, ideally using a quantitative approach. The revision of the HCRs should take into account the following issues: i) a more gradual reduction of fishing mortality (F) to facilitate implementation; ii) clear indications on how to reduce F when required; iii) a temporal framework for the implementation of reduction measures including both the first implementation and the revision of the plan; iv) the effect of fleet segmentation; and v) the interaction (both ecological and in relation to the fishery) between the two species included in the recommendation (sardine and anchovy).

41. Based on the discussion, the meeting proposed including the following activities in the work programme of the SAC:

- a. A two-day dedicated workshop on the assessment of eel on Mediterranean countries, back-to-back with the general EIFAAC/ICES/GFCM WGEEL at the end of October or beginning of November 2015
- b. A dedicated expert meeting on numerical simulation models for the assessment of management strategies, including HCRs, and with a special focus on ongoing management case studies. Specific terms of reference for this meeting should be presented to the SAC for discussion.

CLOSURE OF THE MEETING

42. The meeting expressed appreciation for the efforts behind the development of the meeting. The conclusions and recommendations were adopted on 3 February 2015. The whole report was adopted after revisions and amendments by electronic correspondence.

Agenda

1. **Opening and arrangements of the meeting**
2. **Review of the activities towards the implementation of management plans in selected case studies**
3. **Assessment of management measures in selected case studies**
 - Methodologies for the assessment of management measures;
 - Existing and proposed management measures for small pelagic fisheries in the Adriatic Sea;
 - Potential management measures for demersal fisheries in the Strait of Sicily.
4. **Issues related to the management of eel fisheries in the Mediterranean**
 - Regional objectives in relation to the management of eel fisheries;
 - Discussion on next steps for the assessment of eel at regional scale and towards the preparation of guidelines for the management of eel.
5. **Next steps in the actions for the implementation of management plans**
 - Methodological work on the comparative assessment of Harvest Control Rules and management strategy evaluation;
 - Proposals for new case studies;
 - Identification of required follow up activities.
6. **Adoption of conclusions and recommendations**
7. **Closure of the meeting**

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Management measures for small pelagic fisheries in the Adriatic Sea

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
SPATIAL RESTRICTIONS					
<p>Based on Decision of Council of Ministers No.402, date 8.5.2013 (Approx. Reg. CE 1967/2006), prohibited fishing above sea grass meadows. Exception for purse seine, boat seine nets that during fishing operation do not touch meadows.</p> <p>Prohibited use of purse seines 300 m from the coast or depths less 50 m.</p> <p>Prohibition of use</p>	<p>Areas under special management regime:</p> <ol style="list-style-type: none"> 1. Special habitats of fish and other marine organisms, and regulation of fishing in Velebit Channel, Novigrad and Karin Sea, Prokljan Lake, Marina Bay and Neretva Channel. 2. National Parks: Mljet, Brijuni, Kornati 3. Special Marine Reserve: MalostonskiZaljeviMalo more 4. Nature Park: Lastovo, Telašćica <p>Council Regulation (EC) 1967/2006:</p>	<p>Biological Protection Zone (ZTB) established in the Adriatic Sea to prohibit the use, <i>inter alia</i>, of pelagic trawl.</p> <p>In accordance with the provisions of the Recommendation GFCM/38/2014/1 Italy is in the process of prohibiting the use of any gears targeting small pelagics within 6 miles with derogation for fishing vessels with LoA>15 m (within 4 miles), from 1 to 30 July 2015 from</p>	<p>Fishing with beach seines in the Bay of Boka Kotoroska only allowed in designed sites (fishing posts). Beach seines can be pooled out only on designated places. Specific rules to avoid conflicts among users of fishing posts are also in place. Prohibited fishing with bottom trawls, pelagic trawls and purse seines in Bokakotorska Bay. Fishing with pelagic trawls is prohibited at a distance less than 3 nautical miles from the coast, or at the depth of 50 m, if the isobath of 50 m is located at a distance of less than 3 nautical miles.</p>	<p>Prohibited commercial and leisure fisheries in Portorož and Strunjan Fishing Reserves. Exceptions: fishing aggregations of the winter mullet shoals (special licenses required) and leisure fishing from the shoreline.</p> <p>Council Regulation (EC) 1967/2006: Prohibited use of purse seines at depths less than 70 % of the overall drop of the net. Prohibited use of purse seines 300 m off the coast or within the 50 m isobaths.</p>	<p>GFCM37/2013/1: Areas of aggregation of anchovy and sardine juveniles in their first year of life shall be protected from fishing activities with fishing gears suitable to catch them.</p>

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
<p>of pelagic trawler at 1.5 miles from coast.</p> <p>Prohibited use of trawler (bottom and pelagic) net at Vlora Bay.</p> <p>Fishing is prohibited in areas of 2 km radius from mouth of Buna River and 1 km radius from the mouth of other Albanian rivers and 2 km radius from the mouth of sea lagoon communication channels.</p> <p>Prohibited use of purse seines at depths less than 70% of the overall drop of the net.</p>	<p>Prohibited use of purse seines at depths less than 70 % of the overall drop of the net.</p> <p>Prohibited use of purse seines 300 m off the coast or within the 50 m isobaths.</p> <p>Prohibited towed gears within 3 nautical miles of the coast or within the 50 m isobaths.</p> <p>Prohibited fishing above seagrass beds, coralligenous habitats and mäerl beds*.</p>	<p>Monfalcone to Termoli Council Regulation (EC) 1967/2006: Prohibited use of purse seines at depths less than 70 % of the overall drop of the net.</p> <p>Prohibited use of purse seines 300 m off the coast or within the 50 m isobaths.</p> <p>Prohibited towed gears within 3 nautical miles of the coast or within the 50 m isobaths.</p> <p>Prohibited fishing above seagrass beds, coralligenous habitats and mäerl beds*.</p>	<p>Purse seines (70 m in height and 400 m in length) only allowed in the entrance of the Bokakotorska Bay.</p>	<p>Prohibited towed gears within 3 nautical miles of the coast or within the 50 m isobaths.</p> <p>Prohibited fishing above seagrass beds, coralligenous habitats and mäerl beds*.</p>	

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
TEMPORAL RESTRICTIONS					
	<p>Permanent fishing closure for purse seiners from 15th December to 15th January (possible modification over the years). Temporary closure in 2014. - for all purse seiners above 12 m LOA as from 14 Aug to 24 Dec about 1/3 of inner fishing sea (channel area) - All fishing sea for all purse seiners as from 1 to 14 Dec and as from 24 to 31 Dec. Temporary closure in 2015. All purse seiners as from 15 to 31 Jan and as from 1 to 31 May. For the provisions of Recommendation GFCM/38/2014/1</p>	<p>Closure for pelagic trawlers in August (in 2011 extended from August to September). Specific regulations apply to pair-trawlers and purse seiners (Ministerial decree March 18th 2002), that cannot fish during the weekends. In accordance with the provisions of the Recommendation GFCM/38/2014/1 Italy is in the process of impose a maximum of 180 fishing days per year, not exceeding 20 days per month. For 2015, for vessels targeting specifically anchovy, limit is 144 fishing days per year.</p>	<p>Prohibited fishing and marketing pelagic fish four days prior to the full moon and four days after the full moon. For the Beach seine fishery in the Bay of Boka Kotorska: Fishing by beach seines in fishermen's post used as bathing sites is allowed only at night and up to seven hours by daylight in the period May 1 – October 1.</p>	<p>1. In accordance with the provisions of the Recommendation GFCM/38/2014/1, Slovenia will impose a closure of the fishery in the period 1-15 April 2015 for the vessels fishing for small pelagics. The area of the closure is all waters under the jurisdiction of the Republic of Slovenia. 2. In addition temporary cessation of fishing is foreseen (not yet implemented).</p>	<p>GFCM37/2014/1: Authorized vessels shall not operate for more 20 fishing days per month and shall not exceed 180 fishing days per year. GFCM37/2014/1: For 2015, each fishing vessel shall not exceed 144 fishing days per year in GSA 17. CPCs shall apply spatio-temporal closures of no less than 15 continuous days and up to 30 continuous days in GSA 17. These closures shall be designated in waters under their jurisdiction and shall take place</p>

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
	Croatia is in the process of imposing a maximum of 180 fishing days per year, not exceeding 20 days per month. For 2015, for vessels targeting specifically anchovy, the limit is 144 fishing days per year.				between 1 April and 31 August.
GEAR RESTRICTIONS					
Minimum mesh for surrounding nets of 14 mm. Pelagic trawler net for sardines and anchovies minimum size 20 mm.	Permitted use of artificial light in the purse seine fishery. Council Regulation (EC) 1967/2006: Min. mesh size for trawl nets (20 mm) and for surrounding nets (14 mm) Surrounding nets: max. length 800 m and max. drop 120 m.	Council Regulation (EC) 1967/2006: Min. mesh size for trawl nets (20 mm) and for surrounding nets (14 mm) Surrounding nets: max. length 800 m and max. drop 120 m.	For the beach seine fishery in the Bay of Boka Kotorska: min. mesh size (12 mm); max. length ropes (500 m); towing by moving fishing vessel not allowed. Minimal mesh size for pelagic trawls and purse seines: 20 mm. The largest length of entangling nets (purse seines) is 800 m, and its highest drop is one-third of the armane of the net.	Council Regulation (EC) 1967/2006: 1.Min. mesh size for trawl nets (20 mm) and for surrounding nets (14 mm) 2. Surrounding nets: max. length 800 m and max. drop 120 m.	GFCM37/2013/1: Fishing for fry of small pelagic stocks shall be prohibited with all fishing gears in GSA 17 and GSA 18.

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
MINIMUM SIZE					
<p>Anchovy: 9 cm. (or 110 ind/kg) Sardine: 11cm (or 55 ind/kg) <i>Scomber</i> spp 18 cm. <i>Trachurus</i> spp. 15 cm.</p> <p>Fish smaller than the minimum conservation size shall not be caught, retained on board, transshipped, transferred, stored, sold, displayed or offered for sale (article 3 of Ministerial Regulation No. 1/2014)</p>	<p>Council Regulation (EC) 1967/2006: Anchovy: 9 cm. Sardine: 11 cm <i>Scomber</i> spp.: 18 cm <i>Trachurus</i> spp.: 15 cm</p>	<p>Council Regulation (EC) 1967/2006: Anchovy: 9 cm. Sardine: 11 cm <i>Scomber</i> spp.: 18 cm <i>Trachurus</i> spp.: 15 cm</p>	<p><i>E. encrasicolus</i>: 6 cm in Bay of Boka Kotorska, 11 cm elsewhere. <i>S. pilchardus</i>: 6 cm in Bay of Boka Kotorska, 12 cm elsewhere. <i>S. japonicus</i>: 25 cm <i>S. scombrus</i>: 20 cm <i>T. trachurus</i>: 20 cm <i>T. mediterraneus</i>: 20 cm <i>A. hepsetus</i>: 8 cm <i>B. boops</i>: 13 cm <i>S. maena</i>: 14 cm <i>S. sarda</i>: 45 cm Undersized fish can be up to 20% of total weight of the catch. If catch of undersized fish in one towing >50% of total weight, fishing stops in the area.</p>	<p>Council Regulation (EC) 1967/2006: 1. Anchovy: 9 cm. Sardine: 11 cm <i>Scomber</i> spp.: 18 cm <i>Trachurus</i> spp.: 15 cm</p>	<p>GFCM37/2013/1: Anchovy: 9 cm (or 110 ind/kg), Sardine: 11 cm (or ind/kg)</p> <p>Anchovy and sardine smaller than the minimum conservation size shall not be caught, retained on board, transshipped, transferred, stored, sold, displayed or offered for sale.</p>

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
PARTICIPATORY RESTRICTIONS					
<p>Article 34 of Law 64/2012 Fishing permit required. Fisheries beyond territorial waters only with special authorization</p>	<p>Council Regulation (EC) 1967/2006: Fishing licenses required. Issuing of special fishing permits required within national management plans.</p>	<p>Fishing licenses required. No new fishing licenses without cessation of activity of vessel/s with same GT and kW of engine power</p> <p>Council Regulation (EC) 1967/2006: Fishing licenses required. Issuing of special fishing permits required within national management plans. In accordance with the provisions of the Recommendation GFCM/38/2014/1 Italy is in the process of creating a regime of special authorization for fishing vessels targeting small</p>	<p>Fishing permit required</p>	<p>Fishing licenses required.</p> <p>Council Regulation (EC) 1967/2006:</p> <ol style="list-style-type: none"> 1. Fishing licenses required. 2. Issuing of special fishing permits required within national management plans. 	

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
		pelagics in GSAs 17 and 18. A list of authorized fishing vessels will be established annually.			
LIMITS TO FISHING CAPACITY					
	Fleet capacity frozen since 1/7/ 2013.	<p>On the basis of Council regulations concerning CFP, and srt.19 of Med Regulation (n. 1967/2006) a national management plan for fishing fleet of purse seiners and pelagic trawlers is in force from 20 Sept of 2011, providing fleet reduction through permanent cessation or reduction of effort through temporary closures.</p> <p>See also the participatory restrictions applied</p>		<p>1. Fleet capacity frozen since 31/12/ 2002.</p> <p>2. Since 2012 temporary non-issuing of new licenses has been applied, meaning that no new fishing licenses that would allow use of purse seine (PS), pelagic pair trawls (PTM), demersal trawls (OTB) and drift and fixed nets (GNS and GTRS), were issued and thus preventing potential increase of effort.</p>	<p>GFCM/34/2010/2: general recommended freeze in the fishing capacity of vessels more than 15 m.</p> <p>GFCM37/2013/1: overall fleet capacity of trawlers and purse seiners actively fishing for small pelagic stocks in GSA 17 shall not exceed at any time the reference fishing capacity for small pelagic stocks.</p>

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
		<p>for small pelagics.</p> <p>Council Regulation (EC) No 2371/2002: Fleet capacity frozen since 31/12/ 2002.</p>		<p>3. Measure of the permanent cessation of fishing activity (scrapping) with the support from the EFF was carried out in period 2012-2013. As a result, fleet reduced by 37.6% in terms of GT and for 19.2% in terms of kW.</p> <p>4. There are no more active vessels in the fleet using pelagic pair trawls (PTM).</p> <p>5. Implementation of the scrapping measure had drastic impact on the reduction of landings: total landings in 2011 (just before the scrapping) were 719 tonnes and 238 tonnes in 2013 (reduction of 66.9%). Landings of sardine</p>	

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
				and anchovy in 2011 were 469 tonnes and only 49 tonnes in 2013 (reduction of around 90%) Council Regulation (EC) No 2371/2002: Fleet capacity frozen since 31/12/ 2002. (same as national measure 1)	
MCS MEASURES					
Required registration of vessels in Fishing Fleet Register. Vessel have a National Fleet Register Number,(NFR) as a unique identification number. Vessels on the IUU black list excluded from the	All vessels above 15 m covered by VMS (plan to cover all vessel sizes). All vessels over 15 m equipped with electronic logbooks. Logbook required for all vessels. Council Regulation (EC) 1967/2006: Catches of pelagic trawlers and purse	VMS required for vessels of more than 15 m of length; Logbook required for vessels above 10 m. Logbooks have to be submitted for every fishing trip. Italy is in the process of establishing catch report obligation also for vessels with LOA <10 m (special	Vessels authorized to fish registered in Registry of Vessels of the administrative authority. VMS required for vessels with more than 10 m. First landing only in places meeting the prescribed technical conditions for inspection. Required notification and record of trans-shipment within national vessels. Logbook required for	1. Only Slovenian vessels authorized to land in national ports. 2. VMS required for all vessels with trawls and purse seines and vessels >15 m of length. 3. ERS for vessels >15 m of length. 4. Fishing logbooks	GFCM/33/2009/5 Vessel information submitted to GFCM Regional Fleet Register. GFCM/33/2009/6 Record of fishing vessels >15 m authorized to fish in the GFCM Area. GFCM/33/2009/7 Satellite-based VMS required for vessels >15 m

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
<p>Fishing Fleet Register. First landing in Albanian ports. Transshipment only with prior authorization. VMS required for vessels over 12 m. Logbook required for vessels with more than 10 m (catch above 50 kg must be recorded or if possible the number of fish). Landing and transshipment only in designated ports. Catch certification scheme is in place for products in trade (to combat IUU).</p>	<p>seiners only allowed in designated ports. Obligatory registry of fishing vessels more than 15 m authorized to fish in GFCM area. Logbook required for vessels above 10 m. Any amount greater than 50 kg of live-weight equivalent retained on board must be recorded in the logbook. Daily electronic completion and transmission of fishing logbook data for vessels >than 12 m. Transshipment at sea prohibited; only allowed with specific authorization. Recommended not to issue licenses to vessels that have previously carried out IUU fishing. Compulsory use of</p>	<p>declaration). All the vessels will have the obligation to report also catches of quantity < 50 kg of anchovies and sardines</p> <p>Council Regulation (EC) 1967/2006: Catches of pelagic trawlers and purse seiners only allowed in designated ports. Obligatory registry of fishing vessels more than 15 m authorized to fish in GFCM area. Logbook required for vessels above 10 m. Any amount greater than 50 kg of live-weight equivalent retained on board must be recorded in the logbook. Daily electronic</p>	<p>vessels with more than 10 m, and monthly reports for vessels <10 m LOA. Port State measures to prevent, deter and eliminate IUU fishing.</p>	<p>have to be submitted for every fishing trip, for all quantities and species of fish caught, for all vessels, irrespective of their length.</p> <p>Council Regulation (EC) 1967/2006: Catches of pelagic trawlers and purse seiners only allowed in designated ports. Obligatory registry of fishing vessels more than 15 m authorized to fish in GFCM area. Logbook required for vessels >10 m. Any amount greater than 50 kg of live-weight equivalent retained on board must be recorded in the logbook. Daily electronic</p>	<p>authorized to fish in the GFCM area GFCM/33/2009/8 Required submission of data on vessels engaged in IUU fishing (IUU Vessel List) GFCM/34/2010/1 Required logbook for vessels >15 m authorized to fish in GFCM area. Logbook shall register quantities above 50 kg in live weight GFCM/2008/1 Port State measures to prevent, deter and eliminate IUU fishing GFCM37/2013/1: National control programmes and plans shall be established and communicated each</p>

Albania	Croatia	Italy	Montenegro	Slovenia	GFCM Recommendations
	<p>remote VMS for vessels >12 m. Monitoring and control of fishing capacity. Traceability of products at all stages of production, processing and distribution.</p>	<p>completion and transmission of fishing logbook data for vessels >12 m. Trans-shipment at sea prohibited; only allowed with specific authorization. Recommended not to issue licenses to vessels that have previously carried out IUU fishing. Compulsory use of remote VMS for vessels >12 m. Monitoring and control of fishing capacity. Traceability of products at all stages of production, processing and distribution.</p>		<p>completion and transmission of fishing logbook data for vessels >12 m. Trans-shipment at sea prohibited; only allowed with specific authorization. Recommended not to issue licenses to vessels that have previously carried out IUU fishing. Compulsory use of remote VMS for vessels >12 m. Monitoring and control of fishing capacity. Traceability of products at all stages of production, processing and distribution.</p>	<p>year to the GFCM Secretariat, during the last quarter of the precedent year and not later than 30 October each year.</p>

Management measures for bottom trawling fisheries for *P. longirostris* and associated species in the Strait of Sicily⁴. The regional proposed measures include the measures proposed at the Subregional Workshop on Multiannual Management Plans (GFCM, 2013) and those presented by the EU and Tunisia to the 38th session of the Commission in 2014.

Italy	Malta	Tunisia	Regional proposed measures
SPATIAL RESTRICTIONS			
<p>Two fishery-restricted areas were proposed (not yet in force) to protect hake nursery areas. The proposed closures should have also positive effects on the stock of deep-water rose shrimp.</p> <p>Council Regulation (EC) 1967/2006: Prohibited towed gears within 3 nautical miles of the coast or within the 50 m isobaths, where that depth is reached at a shorter distance from the coast (derogation may apply in special conditions).</p> <p>Prohibited the use of trawl nets within 1.5 nautical miles of the coast.</p>	<p>Fishing is prohibited in additional areas within the waters under Malta’s jurisdiction in order to comply with Article 4 of Council Regulation (EC) 1967/2006.</p> <p>Council Regulation (EC) 1967/2006: Prohibition of towed gears within 3 nautical miles of the coast or within the 50 m isobaths, where that depth is reached at a shorter distance from the coast (derogation may apply in special conditions).</p> <p>Prohibition on the use of trawl nets within 1.5 nautical miles of the</p>	<p>Prohibition of trawling in depths of less than 50 m and within 3 miles from the coast.</p> <p>Prohibited trawling in the Gulf of Tunis all around the year, except the month of July with a prior authorization (in depth more than 50 m).</p>	<p><u>GFCM, 2013:</u> Prohibited fishing above coralligenous habitats and maerl beds.</p> <p>Protection of nursery areas.</p> <p>Establishment of provisions to minimize the encounter of bottom trawlers with unmapped sensitive habitats (e.g., through “move-on” rules).</p> <p><u>EU, 2014:</u> CPCs shall communicate by 31/03/2015 to the GFCM secretariat the spatial restrictions</p>

⁴ The measures adopted by Libya were not listed during the workshop as no Libyan representative/expert attended the meeting

Italy	Malta	Tunisia	Regional proposed measures
<p>Prohibited fishing above seagrass beds, coralligenous habitats and mäerl beds.</p> <p>Prohibited the use of trawl nets fisheries at depths beyond 1000 m.</p> <p>Trawling within the 25-mile management zone around Malta subject to specific regulations:</p> <ul style="list-style-type: none"> -trawling only allowed in certain defined areas, with vessels with less than 24 m; - the overall fishing capacity of the trawlers allowed to operate in the management zone must not exceed the ceiling of 4 800 kW (3 600 kW for Maltese vessels); - the fishing capacity of any trawler authorised to operate at a depth of less than 200 m must not exceed 185 kW. - trawlers fishing in the management zone shall hold a special fishing permit. 	<p>coast.</p> <p>Prohibition to fish above seagrass beds, coralligenous habitats and mäerl beds.</p> <p>Prohibition on the use of trawl net fisheries at depths beyond 1000 m.</p> <p>Trawling within the waters under Malta’s jurisdiction subject to specific regulations:</p> <ul style="list-style-type: none"> -trawling only allowed in certain defined areas, with vessels less than 24 m; - the overall fishing capacity of the trawlers was reduced by 30% in 2013 in line with the management plan; - the fishing capacity of any trawler authorised to operate at a depth of less than 200 m must not exceed 185 kW. - trawlers fishing in the management zone shall hold a special fishing permit. 		<p>in the waters under their jurisdiction which they will apply with a view to protect spawning and nursery areas for deep water rose shrimp and associated species.</p>

Italy	Malta	Tunisia	Regional proposed measures
TEMPORAL RESTRICTIONS			
<p>A specific closed season for distant trawlers (> 18 m LOA) targeting deep water rose shrimps was proposed in the Strait of Sicily (45 days in January-March). Measure not yet in force.</p> <p>Temporal closure for 30 to 45 days per year, defined annually.</p>	<p>Temporary cessation of bottom trawling from 15 August to 15 September to be implemented from 2014 for three years (adopted measure in the National Management Plan).</p>	<p>Prohibition of trawling in Gulf of Gabes (Tunisian part of GSA14) for 3 months (July – September).</p>	<p><u>GFCM, 2013:</u> Adopting common closed seasons by GSAs.</p> <p><u>Tunisia, 2014:</u> stopping of fishing activities by trawlers for all countries (members and non-members) in GSA 14 shall be applied over three (3) months for the year (July, August and September).</p>
GEAR RESTRICTIONS			
<p>Council Regulation (EC) 1967/2006: Minimum square-meshed net of 40 mm at the cod-end or, at the duly justified request of the ship owner, diamond meshed net of 50 mm.</p> <p>Specific rigging requirements for towed gears, including specification for netting materials, net construction and the use of technical devices to improve net selectivity (e.g. square mesh panels).</p>	<p>Council Regulation (EC) 1967/2006: Minimum square-meshed net of 40 mm at the cod-end or, at the duly justified request of the ship owner, diamond meshed net of 50 mm.</p> <p>Specific rigging requirements for towed gears, including specification for netting materials, net construction and the use of technical devices to improve net selectivity (e.g. square mesh panels).</p>	<p>Minimum mesh size in the codend of 40 mm (stretched diamond mesh).</p>	<p><u>GFCM, 2013:</u> Minimum 40 mm square mesh or a diamond mesh size of at least 50 mm in the codend (according to Recommendation GFCM/ /33/2009/2).</p> <p>Improve the selectivity of the gear to reduce the capture of immature individuals and bycatch (e.g. through the implementation of Bycatch Reduction Devices)</p>

Italy	Malta	Tunisia	Regional proposed measures
MINIMUM SIZE			
<p>Council Regulation (EC) 1967/2006: <i>Merluccius merluccius</i>: 20 cm (TL) <i>Pagellus erythrinus</i>: 15 cm (TL) <i>Nephrops norvegicus</i>: 20 mm (CL), 70 mm (TL) <i>Parapenaeus longirostris</i>: 20 mm (CL)</p>	<p>Council Regulation (EC) 1967/2006: <i>Merluccius merluccius</i>: 20 cm (TL) <i>Pagellus erythrinus</i>: 15 cm (TL) <i>Nephrops norvegicus</i>: 20 mm (CL), 70 mm (TL) <i>Parapenaeus longirostris</i>: 20 mm (CL)</p>	<p>Regulations are being revised and updated to include among others a minimum size for deep-water rose shrimp.</p>	<p><u>GFCM, 2013</u>: Minimum conservation sizes should be defined and harmonized in the sub-region, based on the best scientific knowledge about maturity.</p> <p><u>EU, 2014</u>: <i>P. longirostris</i>: 20 mm CL <i>M. merluccius</i>: 20 cm TL <i>Mullus barbatus</i>: 11 cm TL <i>P. erythrinus</i>: 15 cm TL <i>P. bogaraveo</i>: 33 cm <i>N. norvegicus</i>: 20 mm CL</p> <p>Individuals smaller than the minimum conservation size shall not be caught, retained on board, transhipped, transferred, stored, sold, displayed or offered for sale.</p>

Italy	Malta	Tunisia	Regional proposed measures
PARTICIPATORY RESTRICTIONS			
<p>Council Regulation (EC) 1967/2006: Fishing licenses required. Issuing of special fishing permits required within national management plans.</p>	<p>Council Regulation (EC) 1967/2006: Fishing licenses required. Issuing of special fishing permits required within national management plans.</p>	<p>Bottom trawl fishing requires a permit that can be renewed every year following the review of related documents.</p>	<p><u>GFCM, 2013:</u> Consider mechanisms to control access in order to adapt the fishing effort and fishing capacity according to the status of the resource.</p>
LIMITS TO FISHING CAPACITY			
<p>A fleet reduction program is ongoing. Council Regulation (EC) No 2371/2002: Fleet capacity frozen since 31/12/ 2002.</p>	<p>Reduction of fishing capacity by 20% between 2013 and 2016 (measure adopted in the National Management Plan). Council Regulation (EC) No 1380/2013: Fleet capacity frozen since 31/12/ 2002.</p>	<p>Construction of new trawlers subject to prior authorization.</p>	
MCS MEASURES			
<p>Council Regulation (EC) 1967/2006: First landing of catches of bottom trawlers only allowed in designated ports. Obligatory registry of fishing vessels</p>	<p>Council Regulation (EC) 1967/2006: First landing of catches of bottom trawlers only allowed in designated ports.</p>	<p>Logbooks required for every fishing trip. Catch certification system. Sanitary control of freezer</p>	<p><u>GFCM, 2013:</u> Concerned Parties should make efforts to implement GFCM recommendations related to MCS, including those listed below:</p>

Italy	Malta	Tunisia	Regional proposed measures
<p>more than 15 m authorized to fish in GFCM area.</p> <p>Logbook required for vessels above 10 m.</p> <p>Any amount greater than 15 kg of live-weight equivalent retained on board must be recorded in the logbook.</p> <p>Daily electronic completion and transmission of fishing logbook data for vessels with more than 12 m.</p> <p>Transshipment at sea prohibited; only allowed with specific authorization.</p> <p>Recommended not issuing licenses to vessels that carried out IUU fishing.</p> <p>Compulsory use of remote VMS for vessels with more than 12 m.</p> <p>Monitoring and control of fishing capacity.</p> <p>Traceability of products at all stages of production, processing and distribution.</p>	<p>Obligatory registry of fishing vessels more than 15 m authorized to fish in GFCM area.</p> <p>Logbook required for vessels above 10 m.</p> <p>Any amount greater than 15 kg of live-weight equivalent retained on board must be recorded in the logbook.</p> <p>Daily electronic completion and transmission of fishing logbook data for vessels with more than 12 m.</p> <p>Transshipment at sea prohibited; only allowed with specific authorization.</p> <p>Licenses not issued to vessels that carried out IUU fishing.</p> <p>Compulsory use of remote VMS for vessels with more than 12 m.</p> <p>Monitoring and control of fishing</p>	<p>trawlers.</p> <p>Prohibition of transshipment of fish products at sea.</p>	<ul style="list-style-type: none"> - Vessel information submitted to GFCM Regional Fleet Register. - Record of fishing vessels larger than 15 m authorized to fish in the GFCM Area. - Satellite-based VMS required for vessels >15 m authorized to fish in the GFCM area. - Required submission of data on vessels engaged in IUU fishing (IUU Vessel List). - Required logbook for vessels exceeding 15 m authorized to fish in GFCM area. Logbook shall register quantities of each species caught and kept on board, above 50 kg in live weight. - Adoption of Port State measures to prevent, deter and eliminate IUU fishing. <p>Strengthen national capacities for fisheries monitoring, control and surveillance.</p> <p>Concerned Parties are responsible for implementing the adopted management measures in their jurisdictional waters and by vessels flying their flag beyond</p>

Italy	Malta	Tunisia	Regional proposed measures
	<p>capacity.</p> <p>Traceability of products at all stages of production, processing and distribution.</p>		<p>national jurisdiction.</p> <p>Development of a specific mechanism for MCS in areas beyond national jurisdictions covered by the management plan.</p> <p>Improve the collection of fisheries statistical data, including social and economic data.</p> <p><u>EU, 2014:</u> CPCs shall maintain an updated register of vessels authorized to operate in the Strait of Sicily targeting demersal stocks. CPCs shall communicate to GFCM Secretariat not later than 30 November of each year the list of vessels which have used bottom trawls to fish demersal stocks in the areas referred to in paragraph 1 in the past year.</p>

Results of country evaluations of the effectiveness of management measures in meeting the objectives of the adopted and proposed plans for fisheries in the Adriatic Sea

Table 1.E shows the evaluation of how measures adopted nationally were addressing the GFCM recommendations concerning the management plan for small pelagic fisheries in GSA 17 and 18. For a full description of the measures adopted nationally see Appendix C.

Table 1.E. Assessment of how national measures are addressing the GFCM recommendations GFCM/37/2013/1 and GFCM/38/2014/1. NA: measures not applicable to countries fishing in GSA 18.

Management measures	Albania	Croatia	Italy	Montenegro	Slovenia
Spatial restrictions	Yes	Yes	Yes	Partially	Yes
Temporal restrictions	No	Yes	Yes	No	Yes
Gear restrictions	Yes	Yes	Yes	Partially	Yes
Min. size	Yes	Yes	Yes	Partially	Yes
Fishing capacity	NA	Yes	Yes	NA	Yes
MCS	Yes	Yes	Yes	Partially	Yes

Table 2.E shows the effectiveness scores of national measures in meeting the specific objectives a) and b) of the plan, that is:

a) the exploitation rate $E (=F/Z)$ at less than 0,4 per year on appropriate age groups both for anchovy, sardine stocks while considering that the average natural mortality over the same age groups is of 0.81 for anchovy and 0.76 for sardine.

b) a precautionary mid-year spawning stock biomasses, estimated in a consistent manner with the same methodology, above 109 200 tonnes for sardine and 250 600 tonnes for anchovy (hereinafter SSBpa).

In only one instance (assessment of minimum size by Montenegro) a different score was given to objectives a) and b). Therefore scores for these two objectives were combined in a single table. The underlying assumption is that the measures affect equally the pressure (E) and state (SSB) indicators. It was noted by experts from Montenegro and Slovenia that the exploitation of sardine and anchovy by national fleets is very low and because of that the adopted management measures can hardly contribute to changes in stock status. Even though scores were given to each individual measure by experts from these two countries, the small size of their fleet should be taken into consideration in the overall evaluation of the expected effectiveness of management measures. There was a general agreement among countries on the effectiveness of two measures. Spatial restrictions aimed at protecting nursery areas were considered moderately effective in maintaining the status of stocks within the established reference points for its possible effect in mitigating fishing mortality on recruits. The experts from Croatia noted that in spite of the positive biological effect, the measure limiting the depth of operation of purse seiners can have negative socioeconomic impacts on the national fleet.

On the other hand, countries were generally in agreement that the establishment of a minimum size is not an effective measure for controlling exploitation rate. On the one hand, minimum size is viewed more as a control measure to discourage the landing of juvenile fish, rather than a measure that affects the exploitation of the stocks. Second, the measure was considered irrelevant when minimum

mesh sizes are in place. It was further noted that the measure has been in place for many years in most of the countries and, despite its importance as a control measure, its inclusion in the sub-regional plan only maintained the status quo conditions in the region and had no effect in meeting the objectives of the plan.

Temporal restrictions were considered minimally effective or ineffective by countries in GSA 18 (Albania and Montenegro) and medium to high effectiveness by countries fishing in GSA 17 (Croatia, Italy and Slovenia). In regards to Albania and Montenegro, both countries have very small fleets of purse seiners and trawlers that operate only a few days per month. Montenegrin vessels, for instance, operate less than 100 fishing days per year. Therefore the implementation of a limit on the number of fishing days required by the management plan was considered irrelevant for controlling the exploitation by the national fleets. On the other hand, in GSA 17, the adoption of the temporal closures and limits to fishing days was considered an effective measure to limit the fishing pressure on stocks. In the case of Croatia, the adopted fishing closures nationally were considered highly effective in controlling exploitation, as the closures coincide with the high catch seasons and spawning periods of the species.

With regards to gear restrictions, one consensual point among participants was that minimum mesh size measures can be an effective measure to limit the exploitation of juvenile sardine and anchovy and thus contribute to the objectives of the plan. However, effectiveness scores varied among countries (medium-high for Albania, Croatia and Slovenia and low (not) effective for Italy and Montenegro). While the reasons for the higher scores by the first group of countries were in accordance with the argument above, the lower scores by Italy and Montenegro were based on different rationales. For Montenegro the effectiveness of the measure was considered low because the overall impact of the locally adopted gear restriction would be low, considering the small size of the fishery and the current low exploitation rate on juveniles ($E=0.15$). In the case of Italy, because the national fisheries already comply with minimum mesh size and other measures controlling the harvesting of juvenile fish, experts considered that the prohibition of fry fishing proposed in the management plan would have no additional effect on the status of the stocks. Also, referring to recent selectivity studies, the experts noted that further increases in mesh size would be ineffective for increasing the selectivity of the gears. Thus, one can conclude from the evaluations that, despite the positive effect of minimum mesh sizes on protecting the juvenile portion of the stocks, changes in mesh size would have no additional effect to the conservation of stocks and therefore would have little use as a potential measure to be considered in alternative management options for the fishery.

As the management plans does not foresee any form of participatory restriction, not all countries evaluated the effectiveness of the measure. Slovenia highlighted the role of licensing in the control of fishing effort while Croatia considered licensing highly effective in preventing effort increase when combined with measures to limit the fishing capacity (see below).

Both Albania and Montenegro lack management measures aimed at limiting fishing capacity. The capacity of the fishing fleet in Montenegro is considered negligible. The country has fixed the maximum number of vessels of the entire fleet to 223 (currently the fleet has 127 vessels), establishing to some degree a limit to an eventual increase in fishing capacity. Limiting the fishing capacity is considered however not effective in controlling the exploitation rate of the stocks. Limiting fishing capacity was considered a highly effective measure by Croatian and Slovenian experts, but more effective in preventing further increases in fishing effort (objective c, see below) than in affecting the current exploitation rates and status of the stock. Italian experts considered that the limits to fishing capacity established in the management plan have no additional effect towards the objectives of the plan since a capacity limit is already in place and enforced.

Variations in the evaluation of the MCS measures were due to differences in interpretation on how to evaluate their effectiveness. Since MCS do not constitute technical management measures but fisheries control measures, some experts scored a low value for their expected effectiveness as a fisheries management measure (Croatia and Montenegro). Others considered them highly effective

because only with strong monitoring and enforcement it would be possible to reach the objectives of the plan.

Table 2.E. Assessment of the expected effectiveness of the measures adopted nationally in meeting the objectives a) and b) of the management plan for small pelagics in the Adriatic Sea. In brackets the score given by Montenegro to objective b. Scores: 0 – not effective; 1 – low effectiveness; 2 – medium effectiveness; 3 – high effectiveness.

Management measures	Albania	Croatia	Italy	Montenegro	Slovenia
Spatial restrictions	2	2	2	1	2
Temporal restrictions	1	3	2	0	3
Gear restrictions	2	3	0	1	3
Minimum size	0	0	0	3 (1)	0
Participatory restrictions	—	3	—	—	0
Fishing capacity	—	3	0	0	3
MCS	—	0	3	1	2

Table 3.E shows the scores for the expected effectiveness of the measures adopted nationally in meeting the objective c of the plan, that is

c) the levels of fishing fleet capacity and fishing effort at the levels authorized and exerted in the year 2011 for the exploitation of small pelagic stocks in GSA 17.

It should be noted that this specific objectives is directed only to countries fishing in GSA 17 (Croatia, Italy and Slovenia).

Opinions varied regarding the most effective measure to meet this objective of the plan. As expected, the direct limitation of fishing capacity was considered by some experts as a highly effective measure to control further increases in effort and capacity. In this respect, the opinion of Italian experts diverged from other experts in GSA 17. According to them limiting the fishing capacity would have no additional effect towards the objective of the plan because the measure is already enforced in Italy and other EU countries. A strong MCS capacity was considered a more effective measure to meet the objectives of the plan. Finally, some countries (Albania, Montenegro, Croatia) considered the value of other technical measures (such as spatial and temporal restrictions) in limiting the level of fishing effort (which is one of the targets of the plan).

Table 3.E. Assessment of the expected effectiveness of the measures adopted nationally in meeting the objective c) of the management plan for small pelagics in the Adriatic Sea. Scores: 0 – not effective; 1 – low effectiveness; 2 – medium effectiveness; 3 – high effectiveness.

Management measures	Albania	Croatia	Italy	Montenegro	Slovenia
Spatial restrictions	2	1	0	3	0
Temporal restrictions	1	3	1	0	0
Gear restrictions	2	0	0	1	0
Min. size	0	0	0	0	0
Part. restrictions	—	3	—	—	0
Fishing capacity	—	3	0	0	3
MCS	—	0	3	1	0

Results of country evaluations of the effectiveness of management measures in meeting the objectives of the adopted and proposed plans for bottom trawling fisheries for *P. longirostris* and associated species in the Strait of Sicily

Since a subregional plan has not been developed yet for this fishery, participants were asked to consider the evaluation of the effectiveness of the measures in relation to the proposed set of objectives elaborated during the *Subregional Technical Workshop on Fisheries Multiannual Management Plans for the Western, Central and Eastern Mediterranean, 7–10 October 2013, Tunis, Tunisia*. The Technical Workshop proposed that, in accordance with the GFCM guidelines on management plans (GFCM/36/2012), the sub-regional plan should consider inter alia the following options as objectives:

- a) To counteract and/or to prevent overfishing with a view to ensure the sustainable economic viability of fisheries;
- b) To maintain and/or to restore, to the extent possible, the stock size of harvested species at least at levels which can produce the maximum sustainable yield;
- c) To guarantee a low risk of stocks falling outside safe biological limits;
- d) To ensure protection of biodiversity to avoid undermining ecosystems' structure and functioning.

Participants were also asked to consider in their evaluations the two proposals for management measures presented during the 38th Session of the GFCM (Rome, 2014) by the EU and Tunisia.

Appendix D provides a full description of the measures adopted by each country. Unfortunately, no experts from Libya were able to attend the meeting; therefore, no evaluation could be carried out for the country.

Table 1.F evaluates whether measures adopted nationally were addressing the proposed measures for the fishery. Not all proposed measures are being fully addressed at the moment by the countries analyzed. The adoption of minimum sizes for the target species and limits to fishing capacity are the two types of measures that are adopted by all the countries analyzed. Temporal closures are also used across the countries, but they are not current harmonized as proposed.

Table 2.F reports the effectiveness scores given by experts for each set of management measures. Scores were applied differently by country. For Italy the effectiveness of the set of measures was evaluated for each specific objective separately. For Malta and Tunisia objectives were addressed together and, in some cases, for each specific measure separately resulting in more than one score per type of measure. For instance, in the case of Malta, scores were given for each spatial restriction measured proposed, i.e., prohibited fishing above coralligenous habitats and maerl beds (0), protection of nursery areas (3) and the establishment of provisions to minimize the encounter of bottom trawlers with unmapped sensitive habitats (e.g. through “move-on” rules) (1). The different approaches used by experts makes it difficult to draw general conclusions about the expected effectiveness of the measures.

If we compare the scores given by Italy to the sustainability of the target species (objectives b and c) against the related scores given by Malta and Tunisia, it is possible to identify two technical measures considered of high effectiveness by the three countries: spatial restrictions that protect nursery areas and the establishment of limits to fishing capacity. There is also consensus among countries about the importance of fishery control measures (MCS). The effectiveness of the other measures was valued differently by experts. High scores were given to temporal restrictions by Tunisia, to gear restrictions and minimum size by Malta, and to participatory restrictions by Italy and Malta.

Table 1.F. Assessment if national measures are addressing the measures proposed during the Technical Workshop on Fisheries Multiannual Management Plans (7–10 October 2013, Tunis, Tunisia) and the proposals submitted to the 38th session of the Commission (Rome, 2014).

Management measures	Italy	Malta	Tunisia
Spatial restrictions	Partially	Yes	Partially
Temporal restrictions	Partially	No	Yes
Gear restrictions	Yes	Yes	No
Min. size	Yes	Yes	Yes
Participatory restrictions	Yes	Yes	Partially
Fishing capacity	Yes	Yes	Yes
MCS	Yes	Yes	Partially

Table 2.F. Assessment of the expected effectiveness of the measures adopted nationally in meeting the proposed objectives for the management of trawling fisheries for *P. longirostris* and associated species in the Strait of Sicily (see text for a description of objectives). Scores: 0 – not effective; 1 – low effectiveness; 2 – medium effectiveness; 3 – high effectiveness. *scores given to the protection of nursery areas.

Management measures	Italy	Malta	Tunisia
Spatial restrictions	a. 1 b. 2 c. 3 d. 3	0, 3*,1	2, 3*
Temporal restrictions	a. 1 b. 2 c. 2 d. 1	0	3
Gear restrictions	a. 2 b. 2 c. 2 d. 2	2, 3	–
Min. size	a. 1 b. 2 c. 2 d. 1	3	2
Part. restrictions	a. 3 b. 3 c. 3 d. 3	3	2
Fishing capacity	a. 3 b. 3 c. 3 d. 3	3	3
MCS	a. 3 b. 3 c. 3 d. 2	3	2, 3

Pilot action towards the assessment of European eel

First phase (to be covered with the existing budget of 2014):

- Creation of a SharePoint on GFCM Expert Group on Eel
- Provision of basic documents and relevant articles
- Site selection for data collection at the national level
- Dissemination of a concept note about the plan of action to all GFCM countries not present at the WG (e.g., Egypt, Algeria, Morocco, etc.)
- Definition of minimum set of data for the application of models well suited for coastal fisheries.
- Elaboration and distribution of a template for a survey on eel sites
- Data collection at national level: wetted areas (i.e., suitable and potentially suitable), historical data from literature and any available source as well as survey in selected sites
- Distribution of the database template
- Overview of suitable models for coastal lagoons and inland fisheries

Second phase:

- First attempts at running the model
- Preparation of a template for “mini” national reports that would be compiled by each country before the WGEEL next year
- If needed a **two-day back-to back workshop** will be held before the meeting of the next WGEEL to collate all the data gathered and run models at the regional (Mediterranean) scale.
- Provide the results of the modelling exercise to the WGEEL to be integrated in the international assessment.