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GENERAL FISHERIES COMMISSION
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COMMISSION GÉNÉRALE DES PÊCHES
POUR LA MÉDITERRANÉE

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

SCIENTIFIC ADVISORY COMMITTEE

Eighth Session

Tirana, Albania, 25-28 October 2005

REPORT OF THE SIXTH SESSION OF THE SUB-COMMITTEE ON MARINE ENVIRONMENT AND ECOSYSTEMS (SCMEE) ROME, ITALY, 27-30 SEPTEMBER 2005*

*Available only in English

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN
(GFCM)
SCIENTIFIC ADVISORY COMMITTEE

Report of the meeting of the 7th Session of the Sub-Committee on Marine Environment and Ecosystems (SCMEE)

Rome, Italy, September 27-29, 2005

1 OPENING OF THE MEETING

The sixth meeting of the SCMEE (Subcommittee on Marine Environment and Ecosystems) of the GFCM was held in Rome, Italy from September 27-29, 2005.

Twelve scientists assisted the SCMEE (Appendix A).

2 ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE SESSION

The agenda of the Subcommittee and the joint SCMEE-SCSA session was adopted (Appendix B) and the list of documents updated. The final list of documents presented during the meeting is attached as Appendix C.

Alberto García (IEO) chaired the Session also acted as Rapporteur during the SCMEE sessions.

The Subcommittee proceeded to the first topic on which the SAC had sought advice.

3 UPDATED INFORMATION ON PROTECTED SPECIES

ACCOBAMS[1] informed the SCMEE that the UNEP/CMS (Convention on Migratory Species for Animal Wildlife) will hold its 8th meeting of the parties in Nairobi (Kenya). On this occasion, the Principality of Monaco, party of the UNEP/CMS/ACCOBAMS (Agreement on Cetacean Conservation of the Black Sea, Mediterranean Sea and Contiguous Atlantic area) will present a proposal of amendment of the CMS appendices based on the ACCOBAMS Scientific Committee advices. The proposal will ask the CMS parties to include the Appendix I and II the short-beaked common dolphin and to extend the geographical area of the striped dolphin in Appendix II to the Eastern Mediterranean.

4 PROPOSAL OF FORMAL ADOPTION BY THE SAC-GFCM OF THE MED-LEM (LARGE ELASMOBRANCHS MONITORING IN THE MEDITERRANEAN) PROTOCOLS INCLUDING THE BY-CATCH OF LARGE PELAGIC SHARKS

Document 1 dealt with a presentation on MED-LEM data base designed to collect and conserve data from this monitoring program on the captures and sightings of the large cartilaginous fishes occurring in the Mediterranean Sea and possibly the Black Sea. The program aims to acquire knowledge and conservations status of sharks by following common protocols.

The MEDLEM data base establishes a procedure on data collection of specimens that may have been incidentally captured, sighted or stranded. The sheets provided by the program define a common protocol to field data collection, sampling procedures and standard morphological measures of sharks. At present, it also provides a collection of scientific references (around 400) on elasmobranchs from the Mediterranean. Among one of the

[1] www.ACCOBAMS.net

advantages of the proposed data base is based on its wide distribution among many different Mediterranean research centres.

Some discussion emerged as to the manner in which from the different countries may report on the by-catch of fisheries to this data base. The demand of this type of information did not seem an easy task to SCMEE participants. ICCAT may also have information on shark by-catches but it may not be made available for this program. Nevertheless, the actual network of scientists providing information to the MED-LEM program was considered rewarding at present to continue with the MED-LEM effort.

Information on international programs under the GLOBEC umbrella, such as the regional program CLIOTOP (CLimate Impacts on Oceanic TOp Predators) was made available to the SCMEE participants. It was considered that the MED-LEM scientific network be made aware of such international initiatives that may provide a leeway for multi-disciplinary research of top-predators.

Recommendation:

The SCMEE recommends the SAC ask the joint GFCM-ICCAT Working Group to have access to data on the shark by-catches of tuna fisheries for the MED-LEM data base.

The participants were informed through a note passed to the SCMEE by the RAC/SPA (UNEP-MAP) on the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean.

The SCMEE was informed by a MEDSUDMED representative on an exercise of shark age reading held in Mazzara del Vallo, Sicily.

5 STATE OF THE ART IN DEEP-SEA RESEARCH. ACHIEVEMENTS AND FUTURE ACTIONS TOWARDS DEVELOPING RESEARCH PROGRAMMES ASSESSING THE IMPACT OF FISHING AT DEPTHS GREATER THAN 1000 METERS, INCLUDING THE INVESTIGATING THE USE OF DIFFERENT FISHING GEAR TYPES.

Document 2 describes a “Proposal for a representative network of protected deep-sea sensitive habitats in the Mediterranean”. The network of deep sea sensitive sites includes five different unique habitats in the Mediterranean, that is: sea mounts, chemosynthetic communities, submarine canyons, cold-water corals and brine pools.

It provides “fact sheets” or information sheets filled by experts of the particular areas containing data and scientific references on five representative habitats of each deep-sea sensitive habitat. These information sheets refer to the following:

- the Alboran Sea seamounts (off the Alboran Sea island)
- the Cap de Creus canyon (information actually being collected)
- the Lophelia reef off Capo Santa Maria di Leuca
- the cold hydrocarbon seeps near the Nile delta
- the Erasthothenes seamount

It was considered by the SCMEE that any recommendation on these specific sensitive sites stemming from the “fact sheets” should be based on sound and relevant information relative to the conservation of bio-diversity and the possible detrimental effects of any anthropogenic actions exerted on these unique ecosystems.

Alboran Sea

The information provided by the “fact sheets” of the Alboran Sea seamount proposal was not considered sufficient to justify the conservation issues put forward by the proposal. Nevertheless, the SCMEE considered important that this deep sea habitat initiate steps towards

more effective conservation procedures. The first step to undertake this task is to collect data and references that testify the uniqueness and the high diversity of this particular ecosystem.

Recommendation

The SCMEE encourages the collection of information relevant to the diversity and uniqueness of the Alborán Sea seamounts so as to initiate conservation measures in the area.

Cap de Creus

No specific advice was made for the Cap de Creus canyon because the "fact sheet" on this deep-sea habitat is still being carried out.

Lophelia reefs off Cape Santa Maria de Leuca

However, in respect to the *Lophelia* reef off Capo Santa Maria de Leuca, the SCMEE agreed that the information provided by the "fact sheet" was pertinent to the conservation this unique ecosystem of cold-water corals. The site is located in international waters between the coordinates: N39°27.72'/E18°10.74': N39°27.80'/E18°26.68': N39°11.16'/E18°04.28': N39°11.16'/E18°32.58'. The depth range of the coral reef is 350-1100 m. There is a fishery from Gallipolli operating around the area targeting on deep-water shrimps (*Aristeus antennatus* and *Aristaeomorpha foliacea*).

Recommendation

The information provided by the fact sheet and from the participants was considered relevant to take conservation measures in this sensitive habitat. The SCMEE recommends the banning of demersal fishery practices over the *Lophelia* coral reef limited by the mentioned coordinates.

Cold Hydrocarbon Seeps off the Nile delta

A highly concentrated region of cold hydrocarbon seeps were observed in the south eastern Mediterranean Sea in waters off between 300 and 800 off the continental slope North Sinai (Egypt) and the Palestinian Authority Gaza strip. The location of the core area is: 31°30'°-31º50'N, 33°10'-34º00' E.

The area harbors an exceptionally high concentration of cold hydrocarbon seeps supporting unique living communities of presumably chemosynthetic organisms such as polychaetes and bivalves.

Recommendation

The SCMEE considered that the area should be given a full protection status by avoiding demersal fishing practices in the area of concentration of cold hydrocarbon seeps.

The Eratosthenes Seamount

The Eratosthenes Seamount is located in the Eastern Mediterranean, between the Levantine Platform to the south and the Cyprus margin to the north, near the subduction zone of the African plate, ca.100 kms south of Cyprus (33°-34°N, 32°-33° E). The flat-topped seamount measures approximately 120 kms in diameter at the base, and rises 1500 m above the adjacent bathyal plain, with a summit 756 m below sea level.

Studies carried out in the area reveal a rich and diverse ecosystem, notably comprised by two species of scleractinian corals (*Caryophyllia calveri* and *Desmophyllum cristagalli*), which were the first live records from the Levant Basin and significantly extended the species' depth ranges, a rare deep water sponge, *Hamacantha implicans*, known previously from a canyon in the western Mediterranean, a remarkably dense population of the deep water actinarian *Kadophellia bathyalis*, and unidentified zoantharians and antipatharians. The high faunal diversity and density indicate a uniquely rich environment in the Levant Basin, possibly an isolated refuge for relict populations of species that have disappeared from the adjacent continental slope.

No fishing activity is reported in the area. It is probably the most pristine environment found in the Mediterranean, and because of this, needs a protection status to avoid the threats posed by human activities.

Recommendation

The SCMEE recommends the banning of demersal fishing practices in the area that defines the *Eratosthenes Seamount.*

6 IMPACT OF DRIFTNET AND SURFACE GILLNET FISHERIES BROKEN DOWN BY MAIN BASIN AND GEOGRAPHICAL SUBAREAS. EXTENSION OF THE ANALYSIS OF IMPACTS OF DRIFTNET ON PROTECTED OR ENDANGERED SPECIES TO THE WHOLE MEDITERRANEAN.

The SCMEE was informed that concerning driftnet fishing activities, the areas off the South Tyrrhenian Sea and the Pelagos sanctuary have driftnet fisheries targeting swordfish and tunas, although the EU regulation 1239/98 have banned such practices since 1/1/2002.

The by-catch of sperm whales, striped dolphin and short-beaked common dolphin has been recorded.

ACCOBAMS informed that during the last meeting of the parties (November 2004) the Resolution 2.13 on pelagic gillnets was adopted, in reference to the following:

- *"Ensure that their fishing operations are conducted in full accordance with the relevant existing regulations aimed at the mitigation of cetacean bycatch;*
- *ensure that their fishing effort, including pelagic drifting and non-drifting gillnets, be reported to the ACCOBAMS Secretariat;*
- *invite Riparian States to join the effort of the ACCOBAMS Parties in preventing further cetacean mortality in the Agreement Area, and to provide relevant information on fishing gear, particularly driftnets, and effort to FAO".*

The last ACCOBAMS scientific committee (2005) was informed that “illegal driftnetting continues to occur at a substantial level e.g. in the southern Tyrrhenian Sea, southern Alboran Sea and in the Ligurian Sea inside and outside the Pelagos Sanctuary (SC3/Doc 35, SC3/Inf12, SC3/Inf 17). Given the prohibition of pelagic driftnetting by various international fora, the Scientific Committee expressed its strong concern about the continuation of this practise, which is of great damage to cetaceans, including threatened populations in the Agreement Area based on IUCN RedList Assessments”.

Furthermore, the problem was discussed at the Annual Meeting of the International Whaling Commission (IWC) (Sorrento, 2004) in which these reported whale and dolphin by-catch were presented. The European Union judged Italy not acting in correspondence with the EU driftnet directives.

Recommendation

The SCMEE recommends the SAC to take note that the reported illegal fishing activities are actually banned by binding international regulations, and that continued reports of these fishing activities affect protected and endangered species.

7 IMPACT OF SURFACE AND BOTTOM LONGLINE FISHERIES ON NON-COMMERCIAL SPECIES, BIRDS AND TURTLES.

General information was provided to the SCMEE on certain fishery interactions with sea turtles. Some fishing gears, as set nets have shown 90% dead turtles catch due the impossibility of turtles to reach the surface for respiration.

The use of larger hooks in the international fleet of long liners may help reduce the catch of turtles. Nevertheless, there are smaller tuna fisheries, such as the albacore, that use small hooks; thereby, producing higher turtle catch rates.

The use of light sticks to attract tunas and other species are extending. It seems that these devices also increase the turtle catch rate. It was stressed that technology should be developed to mitigate the effects of certain devices should be encouraged, e.g. hook shapes and sizes, type of light, etc.

The SCMEE was informed that reports of killer whale (*Orcynus orca*) on the bluefin tuna fisheries is becoming a problem for the Moroccan hand-line fishermen due to the economic loss of the tuna fishery. The INRH of Morocco is initiating is preliminary study to diagnose the situation.

Moreover, information on reports of the interaction between the small pelagic purse seining and the bottlenose dolphin was highlighted. The Moroccan INRH was demanded by the sardine fishermen to study the effects of dolphins on the fishery. Deterrent devices, such as the dolphin tubes, were experimented. The efficiency of this device was estimated at 20%, which diminished with its use. Consequently, the sardine fishermen off the Moroccan coasts refuse to use such a device to deter the approximation of dolphins.

Other deterring devices of electronic nature are being tested presently. It seems promising but at present the results are under analysis.

8 GEOGRAPHICAL OCCURRENCE, SEASONALITY, EXTENT AND EFFECTS OF MUCILAGINOUS ALGAL BLOOMS

No scientific advice was provided to the SCMEE on this issue.

JOINT SESSION SCSA-SCMEE (POINTS 9 TO 13)

9 REVIEW OF THE OUTPUTS OF THE TRANSVERSAL ACTIVITIES (E,G: SCIS MEASUREMENT OF EFFORT; OPERATIONAL UNITS, SCMEE EAF) AND FOLLOW-UP BY SCSA – JOINT SESSION OF SCSA WITH SCMEE

9.1 OPERATIONAL UNITS AND THE MEASUREMENT OF FISHING EFFORT

The Coordinator of the SCSI, Dr Matthew Camilleri, presented the results of the workshop held in Tangiers (4-6 July 2005) on Operational Units and the Measurement of Fishing Effort. He explained that the discussions held during the workshop and the emerging conclusions were based on two pilot studies conducted with the support of Adriamed and Copemed in the Adriatic and Central-Western Mediterranean basins. The Coordinator described how the former study concentrated on drawing up an inventory of Operational Units for the entire sub-region, whilst the latter focussed on obtaining multidisciplinary data on the Operational Units related to the Mediterranean *Coryphaena hippurus* fishery.

Dr Camilleri stated that, with a few adjustments, the data tables used in the Adriamed pilot study to identify Operational Units were adopted by the workshop and were under further discussion during the on-going SCSI session so that they could be finalised and proposed to the SAC. Furthermore, he demonstrated how the *Coryphaena* fishery pilot study obtained monthly catch, effort, economic and biological data at the level of Operational Units. He stressed that if specific fishing effort control regimes are to be implemented by the GFCM then data at such a level of detail would need to be available. He added that information on the fishing activities performed prior and after the *Coryphaena* fishery was collected, thus obtaining an insight on the movement of vessels from one Operational Unit to another and the related implications of applying effort restrictions.

With respect to fishing effort measurement, the SCSI Coordinator explained that little progress had been achieved on this subject due to the absence of focussed studies. Nevertheless, he stated that four levels of fishing effort parameters were identified during the workshop, with the first level describing the minimum parameters required for effort measurement. In addition, it was reported that the important issue of standardising the measure of fishing effort between gears was still pending.

Comments: An objection put forward in the discussion was that these tables do not contemplate the demographic structure of the target species.

9.2 THE CORYPHAENA WG

On the basis of the work carried out by the *Coryphaena* WG within the framework of the COPEMED project (participating countries were Tunisia, Malta Spain in 2004-2005), including the results obtained from the Operational Units pilot study on the *Coryphaena* fishery, a set of management measures were proposed (Appendix D). The SCSA endorsed this management proposal and agreed to forward it to SAC as a recommendation. The SCSA further suggested that, whilst recognising that the size at first maturity was difficult to establish for this species, a minimum landing size could strengthen the management regime and thus future efforts should be made to establish this size, if possible.

Comments: A mention was made by the SCSA on the size of vessels involved in the fishery. It was reported that the majority of vessels are under 15m and it was suggested that the GFCM should contemplate the possibility of also obtaining a list of vessels under 15m operating in international waters.

9.3 PRESENTATION OF RESULTS OF THE EAF WORKSHOP

An overview of the SCMEE transversal EAF Workshop Report held on Ecosystem Approach to Fisheries, Salammbô, Tunisia, 7-9 September, 2005, Tunisia was presented by J. Lleonart at the request of both the SCSA and SCMEE coordinators.

In the view of EAF, the old methods of fisheries assessment were considered compatible, meaning that even new reference points would have to be adapted.

The scope of the EAF workshop explored tools for the analysis of exploited ecosystems, specifically those referring to:

- essential and sensitive habitats
- modelling
- ecosystem indicators
- Marine Protected Areas
- selectivity and gears
- by catch of vulnerable and protected species

An output of the EAF Workshop relies on the formulation of a Strategy/Workplan, that poses a roadmap to the implementation of EAF principles by:

- recommendations to all Subcommittees
- continuation of research on indicators, considering their robustmenss
- reinforcing the transversal collaboration
- invite to test and discuss the use of the two ecological indicators presented the %PPR-TLc and synthetic trend indicator

Comments:

- All the recommendations that emanated from EAF workshop were endorsed by the joint SCSA-SCMEE session.
- An objection was made to the recommendation of the SCMEE EAF workshop referring to the reference indicators recommendation in the phrasing of "acceptable and easily understood by stakeholders". The word "acceptable" to stakeholders was not endorsed by the SCMEE and SCSA.

10 DOCUMENTS PRESENTED TO THE JOINT SCSA-SCMEE SESSION:

Quantifying ecosystem overfishing in the Mediterranean Sea with a new index of fisheries' impact on marine trophic webs

Summary: Theoretical analysis of effects of catches on energy transfer along trophic webs allows quantifying the relative theoretical decrease in secondary production with respect to the unfished state. The decrease in production is proposed as a proxy for quantifying ecosystem effects of fishing, and it is formally defined in a new index of ecosystem overfishing, L (Loss in production) index. From theoretical network analysis, L index formulation is based on properties of catches (Trophic Level and Primary Production Required) and of exploited ecosystems (Primary Production and Transfer Efficiency) and allows estimating the index for mass-balance models and landing data. Application of the index to 51 ecological models of exploited ecosystems, previously classified as overexploited or sustainable exploited, allows associating a probability of being sustainable fished to each index value. Successively, L index, estimated from landing data and outputs of ecosystem models for the Mediterranean Sea, allows quantify current level of exploitation, expressed as probability of being sustainable fished, for many marine ecosystems. Moreover, by fixing desired probability levels as reference points, the corresponding index values provide basis for back-estimating the associated maximum allowable catches. The index is also applied to outputs of dynamic models of exploited ecosystems allowing an evaluation of sustainability of fisheries along time for the past fishing history and for future scenarios of alternative management options. Results evidence the usefulness of L index in providing general basis for quantifying the level of

disruption for Mediterranean ecosystems subjected to different fishing pressures and allow defining an ecosystem-based reference framework for fisheries management.

Comments: This work provided an example on the use of ecological indicators to the EAF principles by using concepts and tools such as, trophic level, trophic efficiency, primary production required (as an indicator of ecosystem functioning) and diversity. New ways are explored to evaluate new indices of ecosystem overfishing.

Historical series of small pelagics in the Mediterranean Sea: do they present any recognisable pattern?

Summary: We formulate three questions regarding the data series of small pelagics landings in the Mediterranean sea, i.e.: i) Do sardine and anchovy have inverse trends that would suggest species replacement or substitution, as reported for other areas of the world?, ii) Does *sardinella*, a species of tropical affinities, substitute the temperate-water sprat?, and iii) What is the relationship between trends of small and large pelagics?

To answer these questions we analysed two historical data sets: (i) FAO FISHSTAT+ GFCM data base for the Mediterranean and Black sea, by statistical division from 1970 to 2003 and (ii) A series of effort and landings in Barcelona harbour from 1992 to 2003, where data is disaggregated by species, day, and boat.

For the Mediterranean no significant correlation between sardine and anchovy catches were found. Only the statistical divisions Aegean and Sardinia showed a significant positive correlation. Sardine and anchovy CPUE also did not correlate in Barcelona harbour data at different temporal scales (daily, annual). Sardinella shows a clear increasing trend, but sprat reported catches are only significant in the Black Sea, no significant correlations were found.

Correlation between small and large pelagics is positive and significant in the Mediterranean.

The main conclusions reached are: i) Replacement or alternation of sardine and anchovy in the Mediterranean cannot be sustained, ii) Sardinella shows a clear increasing trend. However the low sprat reported catches do not allow us to pronounce about the possibility of substitution, and iii) The significant positive correlation between small and large pelagics seems to indicate the existence of a bottom-up control mechanism. This would suggest management measures addressed to maintain high biomass levels of small pelagics in order to made available large amounts of the more valuable large pelagics.

Comments: The joint SCSA-SCMEE considered that the catch values do not reflect the real biomass and no conclusions can be obtained from the analysis of the FAO FISHSTAT PLUS database.

An overview of the researches carried out in the Northern Adriatic Sea and Venice Lagoon (2000-2005) in the framework of the Ecosystem based approach to fishery management.

Summary: The northern Adriatic Sea and the Venice Lagoon are subjected to intensive fishing exploitation. In the framework of assessing the direct and indirect effects of this source of ecological disturbance different researches were carried out, including experimental and modelling analyses. In the Venice Lagoon, the direct effects of mechanical clam harvesting (an exploitation activity which targets the allocthonous species *Tapes philippinarum*) were experimentally investigated. Major effects on the bottom morphology, benthic communities, nutrient and sediment resuspension were described. Data were integrated into a mass-balance model, allowing to inferre that this exploitation activity induces severe effects on the whole ecosystem, reducing its maturity. According to the model a positive feedback between mechanical clam harvesting and *T. philippinarum* population was identified. In fact this species, due to its capability to feed on SOM, could partially benefit from the food supply represented by the organic matter resuspended during fishing. This result could explain the resistance of this species to its intensive exploitation. Furthermore negative effects of mechanical clam harvesting on artisanal fishery were described in the lagoon. The analyses of

long-term time series of the landings (1946-2000) allowed further descriptions of the ecological stages of this ecosystem in relation to fishing exploitation and nutrient enrichment. The same approach was applied regarding the Northern Adriatic Sea. Main research topics were the evaluation of stress induced on non-target species due to trawling operations (physiological stress, sub-lethal damages, survival). Furthermore, an assessment of discard composition in demersal fisheries was carried out, whereas the study of recolonisation dynamics of benthic communities highlighted that chronic fishing strongly reduced the benthic biomass and production in disturbed areas. Collected data were assembled in a mass-balance model which will allow exploring the effects of fishing on the whole ecosystem.

Comments: no comments

11 PURSUING ACTIVITIES ON THE IDENTIFICATION OF BIOLOGICAL INDICATORS, ESTABLISHING REFERENCE POINTS AND TESTING THEM ON SELECTED FISHERIES OR GSAS

Use of fisheries independent data for the definition of the stock status of *Mullus barbatus* utilizing mortality rates based reference points.

Summary: The goal of this paper is to describe the main stock assessment attempts made up to now in Italy with the exclusive use of fisheries independent data and reference points based on mortality rates and to discuss their usefulness as well as the reliability of the obtained results regarding the red mullet *Mullus barbatus*. Preliminary stock assessments for *M. barbatus* has been performed in the last years using data proceeding from trawl surveys (De Ranieri et al., 1994; Demestre et al., 1997; Voliani et al., 1998; Ardizzone, 1998; Abella et al., 1999; Zamboni et al.,1999, 2000, Abella et al. in press). Yield-per-Recruit, Spawning-per-recruit and Stock/Recruitment analyses were performed as well as Surplus Production

Comments: SC encourage on the use of data coming from direct methods (MEDITS) in order to model fishery systems focusing on management measures.

Temporal variability and spatial diversity of small pelagic fish biomass in the Northern Adriatic sea

Summary: Small pelagic fish aggregate, forming distributions of abundance on a wide variety of space and time scale. This phenomenon is of great ecological and biological importance and has relevant effects on fishery. The major difficulty for understanding fish variability is the lack of sufficient data on biomass variability over both temporal and spatial scales especially over long periods. In the Adriatic Sea distributions of abundance of small pelagic fish were acoustically estimated for more than two decades on a time scale of one year and on spatial scale from aggregations (tenths of metres) to the whole North Adriatic Sea (hundreds of kilometres).

The aim of this paper is to provide a conceptual framework and mathematical tools for study this variety, using acoustic data.

Comments: none

A preliminary contribution on the applicability and the performance of some biological and economic indicators for the Adriatic Sea demersal fisheries. The case of the Operational Units in the western GSA 18

Summary: Indicators represent a valid tool to support the decision making process in fishery management. The principal aims of indicators in fishery management are widely discussed and treated into many scientific and technical documents, as well as discussed in many *fora*. The necessity to identify, select and test some biological and economic indicators (and their associated reference values) is considered relevant for the fishery management and it is becoming a priority for many fisheries. The identification of bio-economic indicators and reference points were also considered in the mandate of the GFCM-SAC. Such indicators should be made available to the policy makers and fishery managers together with

management options concerning each individual stock or resources category. In sub-regional contexts where shared stocks occur, as is the case for the Adriatic Sea, the use of internationally concurred indicators assumes critical importance to support cooperative management by the countries concerned.

Comments: SC observed that economic sustainability may lead to biologic unsustainability. Some systems may have subsidized species or high priced species that may lead to these contradictions.

12 EFFECTS OF FISHING GEAR ON THE MARINE ECOSYSTEMS

No document presented

13 BIOLOGICAL IMPACT OF DIFFERENT FISHERIES MANAGEMENT OPTIONS

Assessing the ecosystem impact of fishing activities on the South Catalan Sea by developing dynamic simulations on fishing effort and target species.

Summary: The development of an ecosystem approach to fisheries in the Mediterranean Sea implies to broader the context on where fishing activities are analyzed and managed. In this framework, an ecological model has been developed in the South Catalan Sea (Northwestern Mediterranean) to describe the structure and functioning of this ecosystem and to assess the impacts of fishing within an ecosystem context. The model includes 40 functional groups representing target and non target species from primary producers to top predators, whilst trawling, purse seining, long lining and troll bait fishing are also explicitly included in the model parameterization. Recently, the model has been calibrated with available time series of data belonging to 1978-2003 time period. This has enabled us to assess the ability of the model to predict the past dynamics of exploited marine resources and to analyze the contribution of internal factors (e.g. trophic interactions) and external factors (e.g. fishing and environment) to resources' dynamics. Moreover, from this calibrated model dynamic simulations can be developed to assess the ecosystem impacts of different management scenarios. In this contribution we present the results of five fishing scenarios developed from the calibrated model in 2003. These scenarios include the modification of global fishing effort and of fishing effort by fleet, in addition with the analysis of different scenarios of fishing on target and non target species (with special attention on hake, anchovy and sardine). These simulations are especially relevant in the Mediterranean context due to they take into account the ecosystem structure and functioning as well as the multispecies nature of fishing practices. The application of the ecological modelling in a Mediterranean context is shown as an appropriated tool to investigate Mediterranean fishing management options and to contribute to evolve the actual reactive management of fishing resources into a more adaptive and strategic one.

Comments: SC recognise the utility and importance of this approach and stress the need to continue to collect essential data, to increase the data base filling some critical gaps and to collect new data in order to monitor model predictions.

14 ELABORATION OF A LIST OF PROJECTS INVOLVED IN THE MONITORING OR CONTROL OF THE IMPACT OF FISHING ON PROTECTED OR ENDANGERED SPECIES TO STRENGTHEN COORDINATION.

ACCOBAMS presented a project for assessing and mitigating the adverse impacts of interactions between cetaceans and fishing activities in the ACCOBAMS Area. The project is endorsed by the ACCOBAMS parties (Portugal, Spain, France, Monaco, Italy, Malta, Croatia, Albania, Greece, Bulgaria, Romania, Ukraine, Georgia, Lebanon, Syria, Libya, Tunisia, Morocco).

The objectives of the project are as follows:

- To collect historical data about the cetacean by-catch.

- To establish an official scheme for independent observers on fishing boats, including data collection procedure
- To collect data about the present cetacean by-catch
- To assess the actual efficiency of pingers (and other ways of avoiding by-catch) and the associated environmental impacts of their use at large scale
- To raise the fishermen awareness about the need of mitigating the impact of fishing on cetacean populations
- To enhance the fishermen capability in handling cetaceans incidentally caught in their fishing gears
- To investigate the efficiency of AHDs (Acoustic Harassment Devices) in reducing nets depredation and interaction with purse seine fishing

A work program based is elaborated to the fulfilment of the objectives. It bears the realization of State of the Art Workshops, elaboration of standard methodology for data collection of cetacean by-catch, Training Workshops, data collections of cetacean by-catch of the participating countries, Workshops on harassing devices, elaboration of a technical manual on handling cetaceans incidentally caught in fishing gears, awareness raising campaigns and pilot experiences with AHDs (Acoustic Harassment Devices).

Recommendation:

Bearing in mind that:

UNEP/CMS/ACCOBAMS and GFCM have common parties (countries) and that the BYCAMS project was prepared in consultation with GFCM, the SCMEE asks SAC to participate in the implementation of the BYCAMS project and take into consideration the ACCOBAMS activities in further actions.

15 OTHER MATTERS

Opinions on transversal activities (SCSA-SCMEE-SCSI).

The EU representative informed on the latest initiatives being carried out to promote future implementation of the ecosystem approach to fisheries (EAF) within the EU member countries. A wide array ecosystem-related data were identified as possible monitoring variables in an EU sponsored workshop in July 11-14, 2005. These refer to food web variables, records of anthropogenic debris, jellyfish abundance, seabird and mammal abundance, etc. Some of these parameters may become mandatory after negotiation, while other may be of optional nature. These will be incorporated into the National Data Collection Program financed by the EU.

Recommendation:

That SAC bears in mind that within a near-future some ecosystem-based parameters will become mandatory for EU member countries *within the data collection program.*

12.2 SCMEE participants that had the chance of attending the EAF Workshop held in Tunisia during September 5-7, 2005, expressed their satisfaction in regards to the scientific output that emerged from the issues raised in the agenda.

Recommendation:

The SCMEE endorsed the recommendations that emerged from the referred Workshop and considered that these recommendations be included in the SCSA-SCMEE reports.

12.3 The participants regretted the low participation of scientists to this SCMEE meeting, which on the whole is considered important in the context of conservation management measures and essential to the EAF implementation in fisheries management.

Recommendation:

The SCMEE recommends the SAC to take some measures that may contribute to a greater participation by exploring different funding channels (i.e, EU and FAO sources) and establish further technical contacts with relevant organizations.

12.4 Election of new coordinator

The SCMEE coordinator expressed that his two-year term of coordinating activities is over and that he wishes to resign from this duty due to professional reasons that will not enable him to fulfil satisfactorily the SCMEE coordination. No candidates rose from the participants, and therefore, the decision on the replacement of the SCMEE coordinator was left to the SAC.

16 CLOSURE OF THE MEETING

The SCMEE adopted the report and listed a series of recommendations to the SAC that are included in Appendix E. The chairman closed the session at 18:00 in September 29, 2005.

APPENDIX A

PARTICIPANTS LIST

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APPENDIX B

AGENDA

Tuesday 27 Sep. 9:00 - 13:00

1. Opening of the meeting
2. Adoption of the agenda and arrangements of the session
3. Updated information on protected species
4. Proposal of formal adoption by the SAC-GFCM of the MED-LEM (Large Elasmobranchs Monitoring in the Mediterranean) protocols including the by-catch of large pelagic sharks

Introduction of the MED-LEM database. Need to consolidate the network. Proposal to SAC-GFCM to adopt the data base and the protocol for data collection in relation with IPOA sharks. Fabrizio Serena.

5. State of the art in deep-sea research. Achievements and future actions towards developing research programmes assessing the impact of fishing at depths greater than 1000 meters, including the investigating the use of different fishing gear types.

A representative network of deep-sea sensitive habitats for the Mediterranean. S. Tudela

Tuesday 27 Sep. 14:30 – 18:00

6. Impact of driftnet and surface gillnet fisheries broken down by main basin and geographical sub-areas. Extension of the analysis of impacts of driftnets on protected or endangered species to the whole Mediterranean.

7. Impact of surface and bottom longline fisheries on non-commercial fish species, birds and turtles

8. Geographical occurrence, seasonality, extent and effects of mucilaginous algal blooms

Wednesday 28 Sep. 9:00 - 13:00 Joint Session of SCSA-SCMEE

9. Presentation and discussion of the results of the SCMEE transversal Workshop on Ecosystem Approach to Fisheries, Salammbô, Tunisia, 7-9 September, 2005.

   i) Overview of the EAF report.

   ii) "*Ecosystem Approach to Fisheries through a new index of fisheries impact on marine trophic webs"* (*S. Libralato, M. Coll, S. Tudela, I. Palomera and F. Pranovi)*

   iii) Historical series of small pelagics in the Mediterranean Sea: do they present any recognisable pattern? J. Lleonart & Maynou

   iv) "An overview of the researches carried out in the Northern Adriatic Sea and Venice Lagoon (2000-2005) in the framework of the Ecosystem based approach to fishery management". S. Raicevich, O. Giovanardi, Granzotto, S. Libralato & Pranovi

(from SCSA agenda; 6) Pursuing activities on the identification of biological indicators, establishing reference points and testing them on selected fisheries or GSAs

i) "Use of fisheries independent data for the definition of the stock status of Mullus barbatus utilizing mortality rates based reference points" (A. Abella, P. Carpentieri, A. Mannini, M. Ria, P. Sartor, C. Viva., A. Voliani)

ii) "Kinds of variability affecting small pelagic fish in the Northern part of the Adriatic Sea" (M. Azzali, A. de Felice, I. Leonori and M. Luna)

10. Effects of fishing gear on the marine ecosystems.

(from SCSA agenda: 8) Biological impact of different fisheries management options

"Assessing the ecosystem impact of fishing activities on the South Catalan Sea by developing dynamic simulations on fishing effort and target species" (*Marta Coll, Isabel Palomera, Sergi Tudela and Francesc Sardà)*

Wednesday 28 Sep, 14:30 – 18:00

11. Elaboration of a list of projects involved in the monitoring or control of the impact of fishing on protected or endangered species to strengthen coordination

12. Other matters

Thursday 29 Sep, morning free

Thursday 29 Sep, 15:00

13. Adoption of the report

APPENDIX C

LIST OF DOCUMENTS

Reference	Title	Presented by:
1	Introduction of the MED-LEM data base. Need to consolidate the network. Proposal to SAC-GFCM to adopt the data base and the protocol for data collection in relation with IPOA sharks..	F. Serena
2	MEDLEM PROGRAM (MEDiterranean Large Elasmobranchs Monitoring), a proposal	S. Tudela
	JOINT SCSA-SCMEE SESSION	
3	Overview of the EAF Workshop report	J. Lleonart
4	Ecosystem Approach to Fisheries through a new index of fisheries impact on marine trophic webs	S. Libralato
5	Historical series of small pelagics in the Mediterranean Sea: do they present any recognisable pattern?	J. Lleonart
6	An overview of the researches carried out in the Northern Adriatic Sea and Venice Lagoon (2000-2005) in the framework of the Ecosystem based approach to fishery management	S. Raicevich
7	BYCAMS ACCOBAMS project	M.C. Van Klaveren

APPENDIX D

A PROPOSAL FOR THE REGULATION OF THE *CORYPHAENA HIPPURUS* (L.) FISHERY IN THE MEDITERRANEAN

Whereas *Coryphaena hippurus* has been listed as a GFCM priority species for which regular stock assessment and co-management of the Mediterranean stock is encouraged.

Whereas the GFCM has adopted a policy to manage Mediterranean fisheries through an effort control regime by Operational Units.

Whereas efforts to assess the Mediterranean *Coryphaena hippurus* stock and to study the associated fisheries have taken place through the FAO-COPEMED sub-regional project since 2000.

Whereas the Code of Conduct for Responsible Fisheries encourages a Precautionary Approach in the absence of sufficient scientific information.

AND

Considering that there is a single stock of the migratory species *Coryphaena hippurus* in the Mediterranean.

Considering that the regulations and management of the *Coryphaena hippurus* fishery varies between countries and a regional management regime is not in place.

Considering that there is an increasing interest in the capture of *Coryphaena hippurus* throughout the Mediterranean.

Considering that the fishing operation targeting *Coryphaena hippurus*, involving the use of Fish Aggregating Devices (FADs) and a surrounding net, is conducted in a similar manner in all sub-regions of the Mediterranean.

Considering that certain regions of the Mediterranean are socially, traditionally and culturally dependant on the *Coryphaena hippurus* fishery.

Considering that important parameters in the measurement of fishing effort for the *Coryphaena hippurus* fishery is the number of FADs deployed and the number of fishing trips.

Considering that no robust stock assessment exercise has been carried out to date due to the particular biological and behavioral dynamics of the species and lack of essential data.

Considering that the *Coryphaena hippurus* fishery mostly targets age 0 fish (2 and 8 months old), thus depending on the annual recruitment which is very variable.

Considering that fishing operations in July capture very small fish under 15cm in length which could give a better yield in later months.

Considering that the relationship between maturity and size is not regular for this species.

A Total Allowable Effort (TAE) regional management regime is hereby being established in accordance with the following regulations:

1. FAD fisheries targeting *Coryphaena hippurus* in the Mediterranean can only operate between 15th August to 31st December.

2. The number of FADs deployed within a given sub-regional fishery management zone should not exceed an average of 10 FADs per square nautical mile.

3. The total number of fishing trips for each vessel operating within a given fishery management zone during a given fishing season should not exceed 72 one-day fishing trips or equivalent.

APPENDIX E

LIST OF RECOMMENDATIONS

- The SCMEE recommends the SAC ask the joint GFCM-ICCAT Working Group to have access to data on the shark by-catches of tuna fisheries for the MED-LEM data base.
- The SCMEE encourages the collection of information relevant to the diversity and uniqueness of the Alborán Sea seamounts so as to initiate conservation measures in the area.
- The information provided on Lophelia reef off Capo Santa Maria di Leuca was considered relevant to take conservation measures in this sensitive habitat. The SCMEE recommends the banning of demersal fishery practices over the zone.
- The Nile delta area harbours an exceptionally high concentration of cold hydrocarbon seeps supporting unique living communities of presumably chemosynthetic organisms. The SCMEE considered that the area should be given a full protection status by avoiding demersal fishing practices in the area of concentration of cold hydrocarbon seeps.
- The Eratosthenes Seamount is located in the Eastern Mediterranean, between the Levantine Platform to the south and the Cyprus margin to the north, near the subduction zone of the African plate, The SCMEE recommends the banning of demersal fishing practices in the area that defines the Eratosthenes Seamount.
- The SCMEE recommends the SAC to take note that the reported illegal fishing activities are actually banned by binding international regulations, and that continued reports of these fishing activities affect protected and endangered species.
- Bearing in mind that: UNEP/CMS/ACCOBAMS and GFCM have common parties (countries) and that the BYCAMS project was prepared in consultation with GFCM, the SCMEE asks SAC to participate in the implementation of the BYCAMS project and take into consideration the ACCOBAMS activities in further actions.
- *SAC should bear in mind that within a near-future some ecosystem-based parameters will become mandatory for EU member countries within the data collection program.*
- The SCMEE endorsed the recommendations that emerged from the referred Workshop and considered that these recommendations be included in the SCSA-SCMEE reports.