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Agenda item 5: **Conservation of Species and Habitats**

5.1.Updating of the regional strategy and action plans for the conservation of the Mediterranean Monk Seal, Marine Turtles and Cartilaginous Fishes in the Mediterranean Sea

Draft updated Action Plan for the Conservation of Cartilaginous Fishes (Chondrichtyans) in the Mediterranean Sea

UNEP/MAP
SPA/RAC - Tunis, 2019

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FOREWORD

Chondrichthyan fishes constitute a class within the zoological classification which includes the cartilaginous fish commonly named sharks, skates, rays and chimaeras. The skates and the rays, or batoids, are flattened shark-like fish.

The Action Plan for the Conservation of Chondrichthyan Fishes in the Mediterranean Sea is in line with:

1) the Barcelona Convention adopted by the Mediterranean countries and the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean;

2) the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) proposed by FAO and adopted by the UN member states in 1999 [Note: in the FAO documents 'sharks' is used for chondrichthyans];

3) the UN Fish Stocks Agreement (UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks) in effect since 11th December 2001;

4) paragraph 31 of the Implementation Plan of the Resolution of the World Summit for Sustainable Development adopted in Johannesburg in September 2002.

In the implementation of the IPOA-Sharks, the Mediterranean Action Plan for the Conservation of Chondrichthyan Fishes constitutes a proposal for regional strategies, pointing out priorities and actions to be undertaken at national and regional level, since regional coordination is needed to ensure implementation of conservation measures. The IPOA-Sharks suggests that member states of the FAO should develop national action plans when their fishing fleets conduct target or by-catch fisheries for sharks. With regard to this recommendation, the Contracting Parties to the Barcelona Convention are strongly urged to elaborate national action plans according to the priorities herein defined, in order to ensure the conservation, management and long-term sustainable use of the chondrichthyan resources in their environment.

Twenty four species enlisted in the Annex II (list of endangered or threatened species) of the SPA/BD Protocol are already protected which based on Recommendation GFCM/36/2012/1 (now GFCM/42/2018/2) cannot be retained on board, trans-shipped, landed, transferred, stored, sold or displayed or offered for sale, and must be released unharmed and alive to the extent possible.
Also, some Mediterranean countries have taken specific protection measures for these species to reinforce their conservation status. Many species of the list appear on the IUCN Red List and in the appendices to the Bern and Bonn Conventions, and some have been included in the CITES appendices.

Although such conservation measures that focus on particular species have been proving to be useful at species level, they are not sufficient at ecosystem level. That is why habitat and environment parameters should be included in the Action Plan. As a result, the guidelines for elaborating an Action Plan are the following:

- species conservation
- biodiversity maintenance
- habitat protection
- management for sustainable use

- scientific research
- monitoring
- funding for research, implementation and monitoring
- public awareness
- international cooperation for controls in the open sea.

Thus, implementation of the Action Plan should involve a great number of stakeholders and its success requires increasing cooperation between different jurisdictions, professional fishermen, conservation and environmental bodies, recreational and game fishing associations, scientific and research organisations and academic institutions, and military and administrative bodies, at national, regional and international levels.

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INTRODUCTION

1. The chondrichthyan fish fauna of the Mediterranean is relatively diverse, with at least 48 species of sharks, 40 of batoids and two of chimaeras, even if some of them have to confirmed. All species are fished as bycatch. however, many of them are sold at fish markets, among them some species are very rare and may never have been common. However, there is evidence of the important negative impact of unmanaged and irresponsible fisheries on the populations of these chondrichthyan species.

2. Chondrichthyan fishes have specific biological characteristics, such as low reproduction productivity due to late sexual maturity and low fecundity, which make them vulnerable to long-lasting stresses and disturbances and slow to recover once depleted.

3. For chondrichthyan fishes, there also exists a close relationship between the number of young produced and the size of the breeding biomass (stock-recruitment relationship) and complex spatial structures (size/sex segregation and seasonal migration) that contribute to their vulnerability to habitat deterioration, environmental pollution, and over-exploitation.

4. Most sharks and some skates and rays are apex predators and have an important trophic function in the marine ecosystem. Therefore, the ecosystem approach is particularly important to understand the role of these fishes in the structuring and functioning of this system. The integrated effects of irresponsible fishing, pollution, and habitat destruction can result in changes in abundance, size structure and biological features, and in the extreme could lead to extinction. The indirect impacts include changes in species prey/predator composition, with species replacement, since fishing tends to remove larger species and larger individuals from ecosystems. Exploitation of chondrichthyans should respect the principles of sustainability and the precautionary principle as defined in the FAO Code of Conduct for Responsible Fisheries.

5. Elasmobranches are by far the most endangered group of marine fish in the Mediterranean Sea. The IUCN Red List shows clearly the vulnerability of elasmobranchs and the lack of data; 39 species (53% of 73 assessed species (2016)) are critically endangered, endangered, or vulnerable.13 % are data deficient (DD).

6. The Contracting Parties to the Barcelona Convention, within the framework of the Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Area of the Mediterranean (MAP Phase II), give priority to ensuring the protection of sensitive species, habitats and ecosystems in the Mediterranean Sea.

7. The decline of some chondrichthyan populations has become a matter for international concern, and a growing number of organisations have expressed the need for urgent measures to be introduced for the conservation of these fish. To this end, SPA/RAC was entrusted (Monaco, November 2001) by the Contracting Parties to the Barcelona Convention with the task of elaborating an action plan–for the conservation of the chondrichthyan populations of the Mediterranean. This action plan was adopted within the frame work of the Barcelona Convention for the protection of the marine Environment and the Coastal Region of the Mediterranean in 2003.

8. Parties to Barcelona Convention requested SPA/RAC during the CoP 20 (Tirana, Albania, 17-20 December 2017) to update this Action Plan. The draft updating, herein presented, was based mainly on:
   - New scientific contribution on the ecology, biology and systematic of cartilaginous fish;
   - New conservation technics;
   - New data, resolutions and recommendations (GFCM…);
   - IUCN red list new assessment.

9. Today, the serious threats to the populations of chondrichthyan fishes are widely acknowledged: mainly unmanaged and irresponsible fishing, pollution and the negative aspects of some littoral development. These threats affect both chondrichthyan biodiversity and abundance. The Mediterranean Sea being a semi-enclosed sea with strongly populated coastal countries, critical habitats have been damaged by some littoral development and pollution. Pollution may harm the marine ecosystem because contaminants, concentrating along the food webs, can alter the physiology and good functioning of individuals and populations.

10. Although the Mediterranean chondrichthyan fish fauna have been studied for a long time, scientific research still needs to be undertaken to study the biology, ecology, population dynamics and status of stocks of most of the species. These studies are necessary to better understand their ecological role. The taxonomic status of several species is still uncertain. A few species are endemic to the Mediterranean. Some Red Sea species penetrate into the eastern Mediterranean through the Suez Canal (Lessepsian migrants); the progression of the populations of these species, and the effect of these invaders on the Mediterranean ecology, should be carefully studied.

11. Since many chondrichthyans are wide-ranging and/or migratory, regional coordination is required for research, monitoring and enforcement. Also, information should be widely disseminated amongst the public to make it aware of the threats to chondrichthyans and the urgent need for their conservation and the management of their exploitation.

A. OBJECTIVES

12. The present Action Plan is aimed at promoting:

12.1. The general conservation of the chondrichthyan populations of the Mediterranean, by supporting and promoting national and regional programmes on reducing bycatch and all other kind of disturbance.

12.2. The protection of chondrichthyan species, mainly whose populations are considered vulnerable;

12.3. The identification, the protection and the restoration of critical habitats, such as mating, spawning and nursery grounds;

12.4. The improvement of scientific knowledge by research and scientific monitoring, including the creating of regional standardised databases;

12.5. The recovery of depleted chondrichthyan stocks;

12.6. Public awareness and capacity-building about conservation of chondrichthyans.

B. PRIORITIES

13. The following general priorities are recommended:

13.1. Urgent provision of legal protection status for the species enlisted in the Annex II (list of endangered or threatened species) of the SPA/BD Protocol, which based on Recommendation GFCM/36/2012/1 (now GFCM/42/2018/2) cannot be retained on board, trans-shipped, landed, transferred, stored, sold or displayed or offered for sale, and must be released unharmed and alive to the extent possible.

13.2. Other species are currently data-deficient with inadequate information to assess extinction risk. Thus, there is an urgent need to assess the status of these species: marbled Stingray (*Dasyatis marmorata*), Reticulate Whipray (*Himantura uarnak*), Lusitanian Cownose (*Rhinoptera marginata*), Round Fantail Stingray (*Taeniurops grabata*), bignose Shark (*Carcharhinus altimus*), copper Shark (*Carcharhinus brachyurus*), blacktip Shark (*Carcharhinus limbatus*), dusky Shark (*Carcharhinus obscurus*), spinner Shark (*Carcharhinus brevipinna*), sharpnose Sevengill Shark (*Heptranchias perlo*), longnose Spurdog (*Squalus blainville*), Shortnose Spurdog (*Squalus megalops*), Bigeyed Sixgill Shark (*Hexanchus nakamurai*) and Longfin Mako (*Isurus paucus*).

13.3. Identify further management and technical measures to minimize bycatch and mortality of sharks and develop management programmes for species currently marketed.

*13.3.1. Primarily for the endangered species: the dogfish (*Squalus acanthias*), the thresher sharks (*Alopias* spp.), the blue shark (*Prionace glauca*).

*13.3.2. Secondly, for the other commercially important species: the catsharks (*Scyliorhinus* spp. and *Galeus melastomus*), the hound sharks (*Mustelus* spp.), the

requiem sharks (*Carcharhinus falciformis, C. limbatus, C. obscurus* and *C. plumbeus*), the skates (*Leucoraja* spp., *Raja* spp.), and the stingrays (*Dasyatis* spp.).

13.4. Ensure good practice for handling rays and sharks caught accidentally and encourage fishing practices that reduce chondrichthyan by-catch and/or facilitate live release.

13.5. Identify critical habitats for their protection and restoration, especially mating areas, and spawning and nursery grounds.

13.6. Develop research programmes on general biology (feeding, reproduction and growth parameters), taxonomy, ecology and population dynamics, with particular regard to genetic and migration studies.

13.7. Develop both systems for the monitoring of fisheries and fishery-independent monitoring programmes.

13.8. Develop training to ensure capacity-building at national and regional level, mainly in the following fields: taxonomy, biology, ecology, monitoring methods and stock assessment.

13.9. Develop information and education programmes for professionals and public awareness.

C. IMPLEMENTATION MEASURES

In order to implement the above-mentioned general priorities, specific measures should be taken at national and regional level:

C.1. Protection

14. Strict legal protection of elasmobranchs species under Annex II (list of endangered or threatened species) of the SPA/BD Protocol to the Barcelona Convention, which concerned by Recommendation GFCM/42/2018/2 on fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3 (cf. paragraphs 10.2 and 11.1) in accordance with national and international laws and conventions. The status of Mediterranean chondrichthyans should be regularly reviewed in order to recommend, when necessary, legal protection for threatened species.

C.2. Fisheries management

15. According to the principles of the IPOA-Sharks and of the UN Straddling Fish Stocks Agreement, states that contribute to fishing mortality for a species or stocks should participate in their management.

16. Existing assessment reports and fisheries management programmes should be adjusted to chondrichthyan fishes or specific plans should be developed within the framework of the IPOA-Sharks and the GFCM recommendation GFCM/42/2018/2.

17. It is urgent to collect precise fisheries statistics, mainly on catches and landings by species. For this purpose, field identification sheets should be published in appropriate languages, with the vernacular names included, and dispatched to fishery people. Also, data on fishing efforts should be collected, as far as possible.

17. bis capacity building training of statistics collectors should be ensured and statistics categories defined.

18. Management programmes for chondrichthyan fishes should be based on studies of the assessment of stocks and populations.
    Management should be also based on by-catch and measures to reduce incidental catches studies. To this end, guidelines for measures reducing by-catch and good handling practices of caught protected species should be published in the appropriate languages and circulated to all potential users. Protected species must be promptly released unharmed and alive to the extent possible.

19. Implementing a permanent monitoring of fisheries where chondrichthyans are impacted is a fundamental management measure, useful for the conservation-of these species. This action would permit the timely detection of an obvious decline in their biomasses that could be an unequivocal sign of over-fishing. This monitoring could be done through surveys, landing-site observation and the examining of logbooks. This action should also address sightings (strandings and observations at sea).

20. For most species, cooperative management is necessary at national, regional and international levels. The mechanisms for achieving a cooperative approach may consist of the following elements:
    - information on existing exploited resources and management systems;
    - the defining and provision of legal instruments;
    - the use of a participatory planning approach;
    - the defining of clear management agreements;
    - the building and development of national groups.

21. Mediterranean countries shall ban finning following GFCM recommendation GFCM/42/2018/2; it shall be prohibited to remove shark fins on board vessels and to retain, tranship or land shark fins.

C.3. Critical habitats and environment

22. Field studies are needed to inventory and map critical habitats around the Mediterranean.

23. Legal protection should be given to these habitats, in conformity with the national and international laws and conventions on the subject, to prevent their deterioration due to the negative effects of human activity. When these habitats have deteriorated, restoration programmes should be undertaken. One example of legal protection is the creation, where possible, of marine protected areas in which human activity is regulated.

24. Such protection measures could be part of fishery management programmes as well as of integrated coastal zone management.

C.4. Scientific research and monitoring

25. Parallel to protection and conservation measures, properly funded and staffed scientific research programmes should be undertaken or developed, mainly on species biology and ecology, emphasising growth, reproduction, diet, geographical and bathymetric distribution, migration, population genetics and dynamics and risk assessment. Regional tagging (conventional, pop-up and satellite tag) programmes should be developed for migratory species. Also, fishing efforts exploratory cruises and the status of resources within the precautionary principle, should be assessed. In the same way, discard should be evaluated in terms of quantity and composition. Research on tools to avoid or reduce by-catch should be fostered.

26. For the monitoring of fisheries, the standardised collection of data at landing places and fish markets should be supplemented and completed by on-board observation programmes to gather precise data on fisheries and on species biology. Also, logbooks adapted to chondrichthyan fisheries should be distributed to fishermen. The following set of data would be required:
    - species composition of the catch with length frequency distribution by sex;
    - retained catch by species in number and weight;
    - discarded catch in number and weight (+ reasons for discard);
    - released species in number (sex, length when possible);
    - gear and vessel specifications and cruise characteristics;

    Furthermore samples (vertebrae, dorsal spines) should be taken and adequately preserved for age determination, and tissue samples for genetic analysis (DNA).

27. Mediterranean countries should design, at both national and regional level, specific programmes, or widen existing ones, to cover the whole Mediterranean Sea, and to collect standardised quantitative data to estimate fish density (relative abundance). This would help evaluate the risk status of the various species.

C.5. Capacity building/training

28. The Contracting Parties should promote the training of specialists, fisheries officers and managers in the study and conservation of chondrichthyan fishes. To this end, it is important to identify already existing initiatives and to give priority to taxonomy, conservation biology and techniques for monitoring research programmes (cf. above paragraph on scientific research).

29. Training programmes should also focus on methods of fisheries data collection and stock assessment, especially data analysis.

C.6. Education and public awareness

30. For protection and conservation measures to be effective, public support should be obtained. In this respect, (1) information campaigns should be directed at national authorities, residents, teachers, visitors, professional fishermen, sport anglers, divers and any other stakeholder (2) Publication materials should be produced to present the life history, and vulnerability, of chondrichthyans and (3) education programme on the issue should be taught for schoolchildren .

31. Also, guidelines for chondrichthyan watching should be published and widely distributed to potential observers such as anglers, yachtsmen, divers, shark-fans, etc, in order to make them actively involved in the conservation of chondrichthyan fishes.

32. In this process of education and public awareness, the help of associations and other bodies involved in nature conservation should be solicited.

C.7. Regional coordinating structure

33. All the above-mentioned recommended actions related to the protection and the conservation of species and their habitats, and the research and educational programmes, should be monitored and implemented, with as much regional cooperation between all the countries operating in the Mediterranean basin as is possible.

34. These actions should be undertaken in cooperation with, and with the support of, other regional fisheries organisations (e.g. GFCM, ICCAT), through establishing MoUs where necessary. Non-governmental organisations, associations and national environmental bodies should also be involved.

35. Implementation of the present Action Plan will be regionally coordinated by the Mediterranean Action Plan's (MAP) Secretariat through the Regional Activity Centre for Specially Protected Areas (SPA/RAC). The main functions of the coordinating structure shall consist in:
    - favouring and supporting the collection of data and publishing and circulating results at Mediterranean level;
    - promoting the drawing up of inventories of species and areas of importance for the Mediterranean marine environment;
    - promoting transboundary cooperation;
    - preparing reports on progress in the implementation of the Action Plan, to be submitted to the Meeting of National Focal Points for SPAs/BD and to meetings of the Contracting Parties;
    - organising meetings of experts on specific subjects relating to Mediterranean chondrichthyans, and training courses;
    - promoting the review of status of species and fisheries by relevant organisations;
    - One year after the adoption of the Action Plan, coordinating the organisation of a Mediterranean symposium aiming at defining the state of knowledge on chondrichthyan fishes and taking stock of the progress made in implementing the Action Plan;
    - five years after the present updating of the Action Plan, organising a meeting to review the progress of the Action Plan and to propose a revision of the Action Plan if needed.

36. Complementary work done by other international organisations with the same objectives shall be encouraged by SPA/RAC, promoting coordination and avoiding possible duplication of effort.

37. Initiatives aiming at ensuring enforcement of the current Action Plan, particularly in international waters, should be promoted.

D. PARTICIPATION IN THE IMPLEMENTATION

38. Implementing the present Action Plan is the responsibility of the national authorities of the Contracting Parties. Parties should facilitate coordination between their national, environmental and fisheries departments to ensure implementation of activities directed at protected and non-protected chondrichthyan species. Organisations or bodies concerned are invited to associate themselves with the work of implementing the present Action Plan. At their ordinary meetings, the Contracting Parties may, at the suggestion of the Meeting of National Focal Points for SPAs/BD, grant the status of 'Action Plan Associate' to any organisation or laboratory which so requests and which carries out, or supports (financially or otherwise) the carrying out of, concrete actions (conservation, research, etc.) likely to facilitate the implementation of the present Action Plan, taking into account the priorities contained therein. NGOs can submit their applications directly to SPA/RAC.

39. The coordinating structure shall set up a mechanism for regular dialogue between the Action Plan Associates and, where necessary, organise meetings to this effect. Dialogue should be conducted mainly by mail, including e-mail.

E. TITLE OF ACTION PLAN PARTNER

40. To encourage and reward outside contributions to the Action Plan, the Contracting Parties may at their ordinary meetings grant the title of 'Action Plan Partner' to any organisation (governmental, NGO, economic, academic etc.) that has to its credit concrete actions likely to help protect chondrichthyan fishes in the Mediterranean. The title of Action Plan Partner will be awarded by the Contracting Parties following recommendations made by the Meeting of National Focal Points for SPAs/BD.

F. F. ASSESSING THE IMPLEMENTATION AND REVISION OF THE ACTION PLAN

41. At each of their Meetings, the National Focal Points for SPAs/BD will assess the progress made in implementing the Action Plan, on the basis of national reports and of a report made by the SPA/RAC on implementation at regional level. In the light of this assessment, the Meeting of the National Focal Points for SPAs/BD will suggest recommendations to be submitted to the Contracting Parties, and, if necessary, suggest adjustments to the timetable given in the Annex to the Action Plan.

Implementation Timetable for the period 2020-2024

ACTIONS	CALENDER	BY WHOM
Tools		
1. Establish a network, enrich and update directory of national, regional and international experts on chondrichthyan fishes. (cf. § 33 of C.7 "Regional coordinating structure")	continuous action (2020-2024)	SPA/RAC, CMS Shark MOU Secretariat, IUCN SSG, RFMO Shark Working Groups
2. Promote the use of the existing Field identification sheets (cf. § 15 of C.2. "Fisheries management")	continuous action (2020-2024)	Contracting Parties & RFMOs
3. Promote the use of the GFCM manual (2019) “Monitoring the incidental catch of vulnerable species in the Mediterranean and the Black Sea: methodology for data collection” (cf. § C.2. "Fisheries management")	continuous action (2020-2024)	Contracting Parties
Formalize/reinforce synchronous submission of catch, bycatch and discard data annually to the GFCM according to DCRF (Data Collection Reference Framework). (cf. § 25 of C.4. "Scientific research and monitoring")	Every year	Contracting Parties
5. Information campaigns and publishing materials for public awareness (cf. § C. 6 "Education and public awareness")	continuous action (2020-2024)	SPA/RAC
6. Promote the use of existing guidelines for reducing the presence of sensitive species in by-catch and releasing them if caught. ; (cf. § 16 of C.2 «Fisheries management")	continuous action (2020-2024)	SPA/RAC and RFMO
7.Update and promote protocols and programmes for improved compilation and analysis of data, for contribution to regional stock assessment initiatives. (cf. § 16 of C2 “Fisheries management” and 25 of C.4. "Scientific research and monitoring")	From 2020 to 2024	National and regional agencies and advisory bodies, CMS, GFCM and FAO.
8. Training manual on cartilaginous fish eco-biology (Taxonomy, biological parameters determination, identification and monitoring of fisheries and	ASAP	SPA/RAC

critical habitats, conservation…) (cf. § 29 of C.6 "Education and public awareness")		
9. Training courses on cartilaginous fish eco-biology (cf. § 27 of C.5 "Capacity building / Training")	ASAP	SPA/RAC
10. Symposium on Mediterranean chondrichthyan fishes (cf. § 33 of C.7 "Regional coordinating structure")	One year after adoption	SPA/RAC
11. Meeting to review progress made on the Action Plan (cf. § 33 of C.7 and § F "Assessing the implementation and revision of the Action Plan")	5 years after adoption	SPA/RAC
Legal processes		
12 a. Legal protection established for endangered species, recommended in this Action Plan, identified by country (species enlisted in Annex II of the SPA/BD Protocol) 12 b. Urgent assessment of the status of data deficient species, recommended in this Action Plan (assessed by IUCN) (cf. § 11.1. of B "Priorities"; C1 "Protection")	ASAP	Contracting Parties,
13. Legal protection for prohibiting "finning" according to the GFCM recommendation (GFCM/42/2018/2) (cf. § 19 of C.2 "Fisheries management")	ASAP	Contracting Parties & RFMOs
14. Critical habitats legally protected and monitored, as soon as they are identified. (cf. § C.3 «Critical habitats and environment")	ASAP	Contracting Parties
15. Establish and promote national, sub-regional and regional plans or strategies for cartilaginous fish species (mainly listed in Annexes II and III). (cf. § 14 of C.2 "Fisheries management")	2020-2024	Contracting Parties, SPA/RAC, GFCM, CMS
16. Facilitating the enforcement of legal measures aiming to set up a system for enforcement of monitoring fisheries in international waters such as extending MEDITS programme to all Mediterranean countries (Mediterranean International Trawl Survey). (cf. § 35 C. 7 "Regional coordinating structure")	2020-2024	Contracting Parties SPA/RAC, GFCM, CMS and EU
Monitoring and data collection		

17. Establishing research programmes, mainly on the biology, ecology and population dynamics of the main species identified by the countries (cf. § C. 4 "Scientific research and monitoring")	2020-2024	Contracting Parties
18. Support the establishing of, or feed the existing, centralised databases (DCRF, MEDLEM…) (cf. § C.7 "Regional coordinating structure")	2020-2024	Contracting Parties and SPA/RAC
19. Inventory of critical habitats (mating, spawning and nursery grounds) (cf. § 11.4 of "Priorities" and § C.3 "Critical habitats and environment")	2020-2024	Contracting Parties
20. Promote existing research proposals developed under the SPA/RAC Action Plan to funding agencies (cf. § C. 4 "Scientific research and monitoring")	2020-2024	SPA/RAC, CPs, AP partners
21.Promote programs on the status of bycatch to propose measures for attenuation of the phenomenon. Such programs should be developed with onboard observers and multispecies approach. (cf. § C. 4 "Scientific research and monitoring")	2020-2024	SPA/RAC, CPs, AP partners
22. Increase compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and GFCM, including through increased use of observers. (cf. § C. 7 "Regional coordinating structure")	From 2020 to 2024	Contracting Parties
23. Support expert participation in RFMO and other relevant meetings and workshops, to share expertise and build capacity for data collection, stock assessment and bycatch mitigation. (cf. § C.5 "Capacity building / Training")	As soon as possible	Contracting Parties, RFMO, SPA/RAC
Management and assessment procedures		
18. Continuously review data and undertake new studies to clarify the status of Mediterranean chondrichthyan species focusing on endemics and species assessed as Data Deficient or Near Threatened (cf. § 11.2 of B "Priorities"; 12 of C.1 ‘Protection’; 25 of C.4 "Scientific research and monitoring")	2020-2024	International organisations
20. Develop and adopt (where these do not exist) national Shark Plans (cf. § C.1 ‘Protection’, C.2. "Fisheries management", & C.3 "Critical habitats and environment").	2020-2024	Contracting Parties

21. Identify further management and technical measures to minimize bycatch and mortality of sharks in fisheries impacting cartilaginous fishes. (cf. § 11.4 of B "Priorities"')	2020-2024	Contracting Parties& RFMOs

ANNEX-I

ASSESSMENT OF THE IMPLEMENTATION OF THE ACTION PLAN FOR THE CONSERVATION OF CARTILAGINOUS FISHES (CHONDRICHTHYANS) IN THE MEDITERRANEAN

(2014 – 2019)

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I – INTRODUCTION

Sharks, skates and rays, collectively referred to as elasmobranchs (Class *Chondrichthyes*) are characterised by slow growth, late maturity, and low fecundity rates. Because of these characteristics, they have very low rates of population increase and limited recovering potential from overfishing (direct or indirect) and other threats as a result of human activities.

To counteract their high vulnerability many action plans have been adopted. On this regard, and in accordance with the existing International Plan of Actions (FAO IPOA-Sharks) and the UN Fish Stocks Agreement, the Contracting Parties to the Barcelona Convention, within the framework of the Mediterranean Action Plan, give priority to the conservation of the marine environment and to the components of its biological diversity and adopted 9 regional Action Plans among them: the Action Plan for the conservation of the cartilaginous fishes (Chondrichthyans) in the Mediterranean (UNEP MAP SPA/RAC 2003), approved at the XIII Conference of Contracting Parties to the Barcelona Convention.

The Action Plan constitutes mid-term regional strategy that should be updated each five-year based on an evaluation of their implementation at regional and national levels.
For the biennium 2018-2019, the Contracting Parties to Barcelona Convention requested SPA/RAC during the CoP 20 (Tirana, Albania, 17-20 December 2017) to update, among others, the Action Plan for the conservation of cartilaginous fishes (Chondrichtyans) in the Mediterranean sea.

The objectives of this update are:
1- Assess the implementation of the Action Plan in the Mediterranean sea at regional and national levels;
2- Propose a draft updating for the Action Plan.

the updating of the Action Plan for the conservation of cartilaginous fishes (Chondrichthyans) in the Mediterranean Sea should be carried out mainly in a participatory and consultative way. the assessment will be built around (1) self-assessment processes (2) a broad consultation with the concerned stakeholders/organisms to help collecting and validation of information.
The report on the Status of implementation should include information on National Plans of Action for the Conservation and Management of Sharks, national fisheries regulations in general and measures applicable to sharks including research, data collection and reporting.
To this end, an evaluation questionnaire, considering the updated online reporting format of the Barcelona Convention (IG.23/1, CoP20, 2017) was finalized to gather information on contribution to the work to apply the action plan by the parties to Barcelona convention, regional organizations / partners / Multilateral Environmental Agreements. The scope is to describe any Achieved or Ongoing Actions identified within the Timetable of the Action Plan (2014-2019) (Annex 1).

The questionnaire was disseminated by the SPA/RAC secretariat to SPA/BD Focal Points, regional institutions and Convention's Secretariats, Associates and Partners of the Action Plan. A questionnaire, with similar scope, was disseminated also to the experts mail listing of the consultant.

This document presents the following outputs based on responses to the SPA/RAC Secretariat's requests for information and on self-assessment processes:

- Evaluation of the implementation of the Shark Action Plan at the national level;
- Evaluation of the implementation of the Shark Action Plan by SPA/RAC.
- Evaluation of the implementation of the Shark Action Plan at the international level;

Evaluation of the comments, programmes, plans and recommendations of international and regional organizations working on shark conservation issues.

II- REVIEW OF THE IMPLEMENTATION OF THE SHARK ACTION PLAN, 2014–2019

The review will be based on the international implementation of the IPOA shark and other international tools, SPA/RAC implementation, national implementation (SPA/RAC focal points and experts' responses) and on bibliographic research.

The questionnaire circulated to Focal Points by the SPA/RAC Secretariat in December 2018 (Annex 2) asked Contracting Parties (CPs) to the Barcelona Convention SPA Protocol to provide a brief update on steps taken at the national level to implement the Shark Action Plan (UNEP-MAP SPA/RAC, 2003). A second questionnaire, with the same scoop, was also circulated to the list of experts (Annex 3). Sixteen responses were received; ten from SPA/RAC focal points, namely Albania, Algeria, Bosnia Herzegovina, Italy, Lebanon, Monaco, Slovenia, Spain, Tunisia and Turkey and one response from the IUCN. Five responses were received from experts from four countries (Albania, Italy, Lebanon and Montenegro). Twelve SPA/RAC focal points did not respond, so this evaluation provides an incomplete picture of activities in the Mediterranean (Annex 4).

For this we consider all responses and extrapolate to some extent from the other focal points comments in 2013 if any.

II- 1. INTRODUCTION

II – 1- 1- Overview on cartilaginous fish landings in the Mediterranean Sea

Elasmobranch are incidentally caught as bycatch, while in some cases they are targeted by commercial fisheries. In the Mediterranean Sea, elasmobranch fish catches represent only 1.15 percent of the total landings (Statistic FAO 1980–2016). A decline in cartilaginous species landings has been observed while fishing effort has generally increased. According FAO statistics of elasmobranchs, the catches show a decreasing trend from 26000 tons in 1983–1984 to about 14500 tons in 2016 (Figure 1). The increase of production noted after 2008 is not related to augmentation of catch but to the contribution of the State of Libya to the FAO official statistic. In fact, the State of Libya begins the ad of their statistic data only in 2009. The landing of elasmobranchs in the Mediterranean Sea without taking into account Libyan statistics don't exceed 9690 tons in 2016.

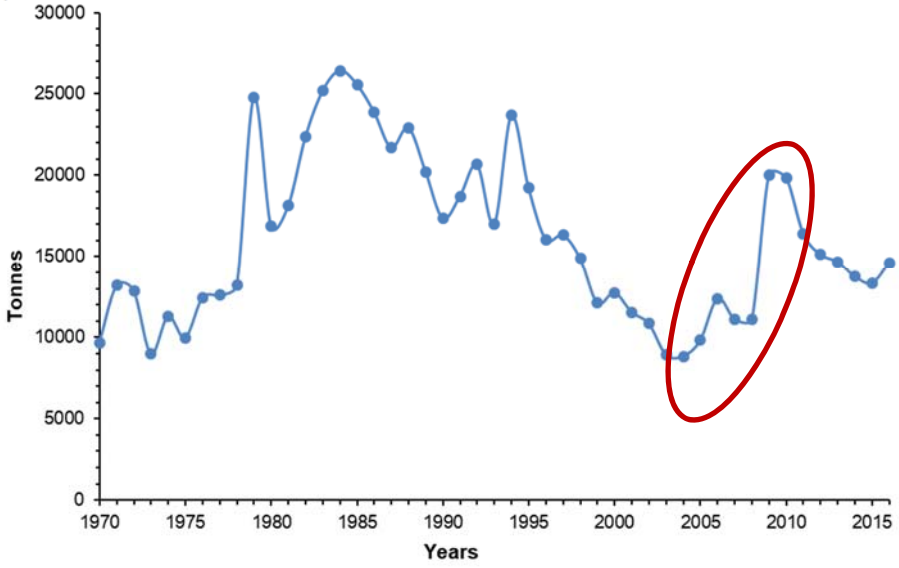

Figure 1: Mediterranean trends of elasmobranchs catches from 1970 to 2016 according to FAO statistics

During the last 7 years, the major elasmobranch-fishing countries within the Mediterranean Sea

are The State of Libya and Tunisia; in fact, they contributed by more than 70% of production (Figure 2). Italy and Turkey known to be the major elasmobranch-fishing countries within the Mediterranean, register a dramatic decrease in catch. The production of sharks and rays was declined by more than 90 % between 1985-2016 in Italy.

Elasmobranchs in the Mediterranean Sea catch are constituted essentially by Rajiiformes and Squaliformes. The Carcharihniformes have declined by about 70 % during the last 30 years (Figure 3).

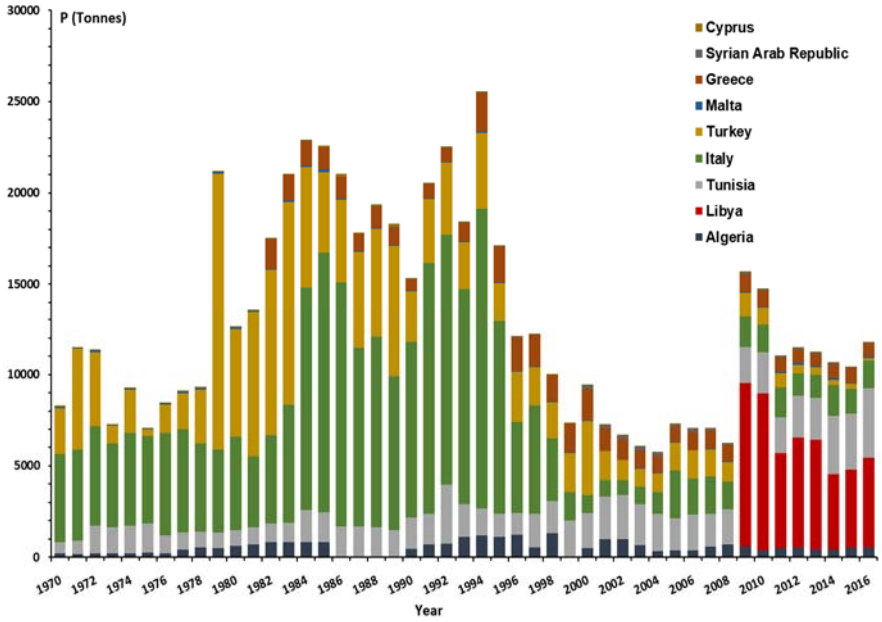

Figure 2: Contribution of some countries in the Mediterranean elasmobranch production according to FAO statistics from 1970 to 2016.

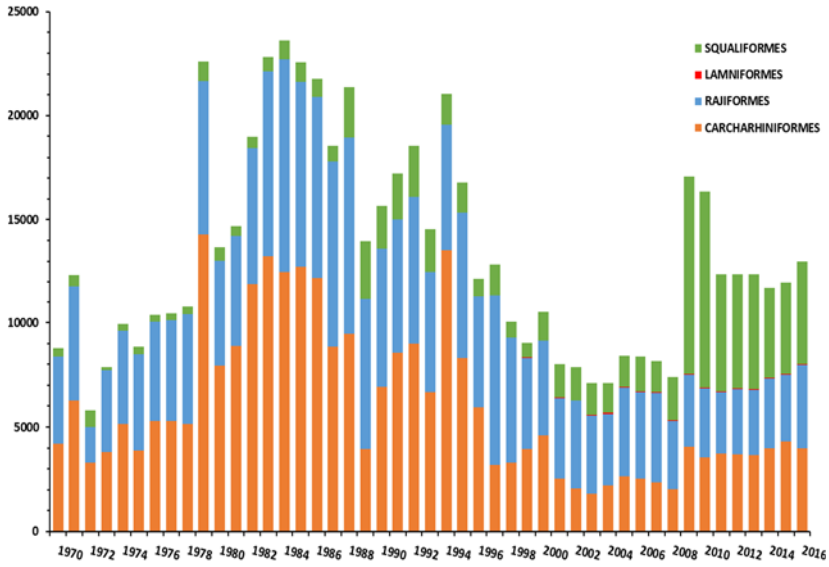

Figure 3: Landing evolution of some elasmobranch groups in the Mediterranean between 1970 and 2016.

Statistical information for many priority species of the GFCM area or of the annexes II and III of SPA/RAC are absent as *Mobula mobular, Carcharodon carcharias, Gymnura altavella, Raja*

miraletus... The species of rays and sharks are usually grouped together in the same statistical category and not identified by species. Some data deposed by species makes a big confusion and seems to be absurd. Landings of angel sharks *Squatina sp* is a good example; more than 800 tons in 2009 and 174 tons in 2016 were landed in The GFCM area. These data are certainly incorrect. The misidentification of species was the sources of these abnormal data. In fact, the situations of the Squatinidae family is very critical in the Mediterranean Sea. The species were locally extinct from many areas. In the North Western Mediterranean where no catches of these species have been recorded for more than 50 years.

II – 1 – 2 Conservation status of cartilaginous fish (Chondrichtyens) in the Mediterranean Sea

Cartilaginous species, including elasmobranchs (sharks and rays) and chimaeras, are by far the most endangered group of marine species. The Mediterranean is considered a biodiversity hot spot for this groups, being at the same time the area in the world with the highest proportion of threatened species because of the overfishing, the wide use of non-selective fishing practices, and the habitat degradation. In fact, there is evidence that the elasmobranchs of the area are declining in abundance, diversity, and range due primarily to the intense fishing activity. The Mediterranean Sea has lost more than 97 percent in number and "catch weight" of their elasmobranch's population over the last 200 years (Fretty et al., 2008).

Historically, the diversity of chondrichthyans was greatest in the western Mediterranean Sea, particularly in the coastal waters of Morocco, Algeria, and Tunisia. Diversity is slightly lower in the northwest Mediterranean countries: Spain (including the Balearic Islands), France, Italy, Albania, and Greece. Intermediate levels of diversity were found in the central Mediterranean countries and the lowest diversity area is in the eastern part of the Mediterranean Sea.

More recently, there has been a significant decline in species richness throughout the Mediterranean Sea due to increasing threats and local extinctions. The number of threatened species was very high with as many as 33 to 38 threatened species found in 100 km^2 in the coastal waters of the western and central Mediterranean Sea. Threat levels are also high throughout the eastern Mediterranean Sea, with as many as 8 to 18 threatened species per 100 km^2 (Figure 4). No country has fewer than 29 threatened species. Geographically, local extinctions have been most prevalent in the NW Mediterranean waters of Spain, France, and Italy, and in the waters of the countries bordering the Adriatic Sea and northwest African countries (Dulvy et al., 2016).

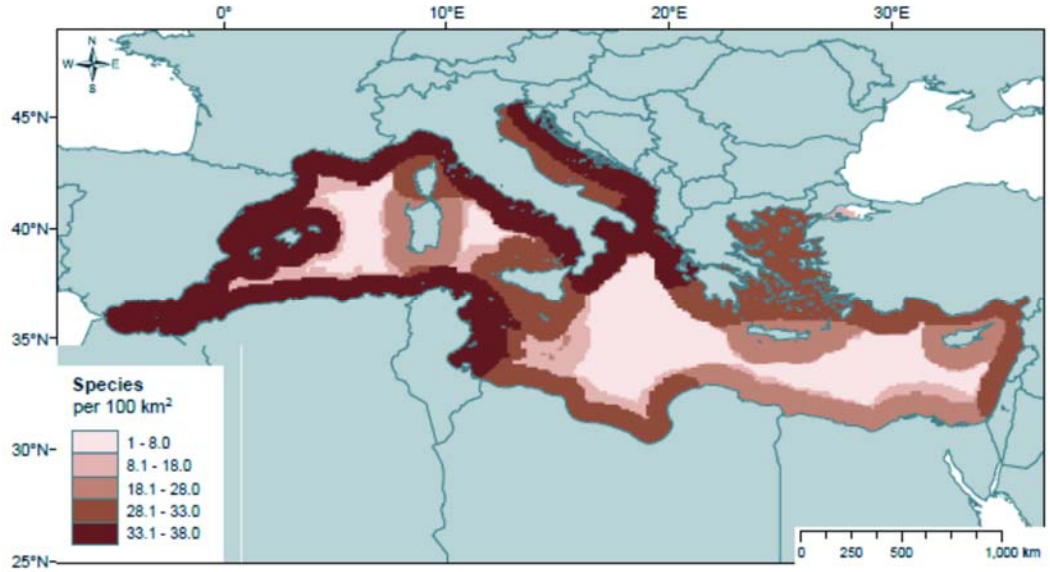

Figure 4: Distribution of threatened (CR, EN, and VU) Chondrichthyans within the Mediterranean Sea (Ref?).

According to the last elasmobranchs assessment made by the IUCN (Dulvy et al., 2016) at least half of the rays (16 of 32 species) as well as 54% of sharks (22 of 41 species) in the Mediterranean Sea face an elevated risk of extinction. However, the Red List status shows that 39 species (53% of all) are critically endangered, endangered, or vulnerable (Table 1). Of 27 chondrichthyan Families occurring in the Mediterranean Sea, 52% (14 Families, 24 species) of which have all species listed as threatened (Alopiidae, Squatinidae, Rhinobatidae…). The situation can evaluate to be worsen, in fact, of the remaining 45% of species in the region, 13 are Data Deficient.
By comparing these findings to the first Mediterranean Sea Red List assessment in 2007 (Cavanagh and Gibson, 2007), there is no sign of improvement in the status of Mediterranean Chondrichthyans and the situation seems to be fearful. The rate of threatened species (CR, EN and VU) pass from 42.25% to 53% during the last decade.
The proportion of data deficient species decrease by 8% between 2007 and 2016 representing significant knowledge enhancement in the Mediterranean Sea.

Table 1: Summary of the Red List status of Chondrichthyans in the Mediterranean Sea (Dulvy et al., 2016). In brackets: Data of the first assessment (Cavanagh and Gibson, 2007).

IUCN Red List Category	Number of Species
Extinct (EX)	0
Regionally Extinct (RE)	0
Critically Endangered (CR)	20 (13)
Endangered (EN)	11 (8)
Vulnerable (VU)	8 (9)
Near Threatened (NT)	9 (13)
Least Concern (LC)	12 (10)
Data Deficient (DD)	13 (18)
Total number of species assessed	73 (71)

II – 2. TOOLS FOR CONSERVATION ACTIONS

II-2-1 Directory of regional experts on chondrichthyan fishes

GFCM was involved with the development through SPA/RAC of a Mediterranean Directory of experts in 2012 then enriched by the IUCN SSG. This list was updated for the period 2014 – 2019 through responses of experts, the IUCN SSG and through research done by the consultant. The list includes now 165 experts and was submitted to the SPA/RAC.

II-2-2 Trainings / Multilingual regional and national field identification guides and sheets

The FAO International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARK (FAO, 1999) mentions: (1) taxonomic problems and (2) difficulties in identifying species after landing.

The Action Plan for the Conservation of Cartilaginous Fish (Chondrichthyans) in the Mediterranean Sea (UNEP PAM SPA/RAC, 2003) recommends, as a matter of priority, developing training for

capacity building at national and regional level, mainly in following topics: taxonomy, biology and ecology.

in this context and in the frame of the implementation of this regional action plan by SPA/RAC, CP of Barcelona convention and international organizations, some trainings and field identification guides were realized:

The ACCOBAMS-GFCM project on mitigating interactions between endangered marine species and fishing activities (2016-2017), coordinated by ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area) and GFCM (General Fisheries Commission for the Mediterranean) Secretariats, in collaboration with SPA/RAC (Specially Protected Areas Regional Activity Centre), aimed to enhance the conservation of endangered marine species, such as cetaceans, sea turtles, elasmobranches and seabirds, and to promote responsible fishing practices in the Mediterranean through six pilot actions in France, Spain, Morocco and Tunisia. The project produced a guideline distributed mainly to fishermen and observers titled" Good practice guide for the handling of sharks and skates caught incidentally during pelagic longline fishing" . Furthermore, a set of 4 "good-handling guides of incidental catches of vulnerable species" were elaborated and related respectively to sea turtles, seabirds, cetaceans and cartilaginous fishes.

In Tunisia a flyer was elaborated to fishermen in French and Arabic to better identify and handle species.

- Poisson et al. (2016) produced a Responsible Fisherman's Guide: Best Practices for Reducing the Mortality of Sensitive Species Incidentally Caught by French Pelagic Longliners in the Mediterranean (in French) in the frame of SELPAL and RéPAST projects;

- In the frame of Med bycatch project "Understanding Mediterranean multi-taxa 'bycatch' of vulnerable species and testing mitigation- a collaborative approach" (September 2017 – June 2020), implemented by ACCOBAMS, GFCM, SPA/RAC, IUCN-Med, Birdlife International (as coordinator), and MEDASSET and financially supported by the MAVA Foundation in three countries (Morocco, Tunisia an Turkey), a protocol "Monitoring the incidental catch of vulnerable species in the Mediterranean and the Black Sea: methodology for data collection" was elaborated by the GFCM with partners contribution. The main objective of this manual is to develop and implement an efficient and standardized data collection and monitoring system for all vulnerable species found in the Mediterranean and Black Sea fisheries (among them Cartilaginous fishes).The protocol was used as working document in the training workshops organized in Tunisia, Morocco and Turkey in October-November 2018 for observers (on-board/in port) involved in the project to better identify vulnerable species and collect data;

- The FAO produced in 2018 Two documents *Species Photographic Plates* for sharks and another for skates, rays and chimaeras (FAO, 2018a; FAO, 2018b). These documents are to supplement the field guide and cards available for the Mediterranean sharks in the FAO fishing area 37.
  These publications have been produced within the framework of the FAO EastMed Project Scientific and Institutional Cooperation to Support Responsible Fisheries in the Eastern Mediterranean and with the assistance of the European Union.

- the SPA/RAC organized with the collaboration of the INSTM (Institut National des Sciences et Technologies de la Mer) and ASCOB-Syrtis (Association de conservation de la Biodiversité dans le Golfe de Gabès) a national training on shark taxonomy (Sfax, 23 – 25 April 2018). A Manuel on identification of sharks and rays in the Mediterranean Sea was elaborated as working document (in French):" Training manual on cartilaginous fish: identifying and recognizing rays and sharks in the Mediterranean" http://www.rac-spa.org/sites/default/files/doc_sharks/requins_fr_web.pdf

II-2-3 Submission of catch, bycatch and discard data to the GFCM

The Mediterranean Action Plan requests CPs to develop programmes to establish baseline data and facilitate reporting at a species-specific level on:

- shark catch rates;
- fishing gear used in shark fisheries;
- amount of incidental and directed take;
- amount of waste and discards;
- size and sex of individuals caught;

According to GFCM/36/2012/3 recommendation, CPCs shall ensure that:
a) information on fishing activities, catch data, incidental taking, release and/or discarding events for shark's species listed in either Annex of the SPA/BD Protocol, be recorded by the shipowners;
b) this information be reported to the national authorities for notification to GFCM Secretariat within the annual national reporting to SAC;
c) any other additional measures taken to improve data gathering….

To status on the implementation of this action, CPs to Barcelona convention were asked if the party *Formalized/reinforced synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the GFCM.*

Responses on this action implementation were received from nine countries: two responded by yes, three by no and the action is under development for three while it is not applicable for one country.

II-3. LEGAL PROCESSES

II-3 – 1 Species protection

The need for a precautionary approach to the management of sharks and rays has been widely highlighted in the last 20 years. In 1999 the FAO adopted the IPOA-Sharks and since than it has undertaken several initiatives to better manage the exploitation of these animals. In 2010 and 2011 the GFCM adopted ad-hoc measures to reduce the by-catch of pelagic sharks such as thresher sharks, mako and hammerhead sharks. In 2012, the GFCM prohibited the capture and sell of the sharks and rays species listed in Annex II of the SPA/BD Protocol of the Barcelona Convention.

Species protection is a major objective of the Action Plan (A.10.2). The 'urgent provision of legal protection status' for endangered species is listed as the first priority for action (B.11.1) and falls under implementation measure (C.1). CPs were asked, in Action 10, to establish strict legal protection for

species listed in Annex II and GFCM Recommendation through national laws and regulations as soon as possible.

Although 80% of CPs who responded to the questionnaire reported that they had protected species (Spain, Turkey, Italy, Monaco, Tunisia, Lebanon and Montenegro) or had measures under development (Bosnia-Herzegovina), implementation has been incomplete, with 10% of CPs reporting no action. All the Annex II species have been included in the Spanish Red List since 2015. Turkey reported protecting All the Annex II species under fisheries law in 2016. Similarly, for Monaco, all chondrichthyan species listed in Annex II of the SPA Protocol enjoy protection status under Article O. 230-1 of the Code of the Sea.
To reinforce the application of national and international legislation and to cope with the growing phenomenon of uncontrolled fishing and landing of threatened marine species, a circular 128 of July 2, 2015 of the Minister of Agriculture asked governors to form regional teams formed from several departments (Ministries of Agriculture, Interior, Defence and Trade) to fight against this phenomenon in landing ports, fish whole sale markets and details markets according to the provisions in force and mainly the recommendations of ICCAT and GFCM. It is to report that for Tunisia GFCM recommendations are binding.

Lebanon and Montenegro protect a smaller number of Annex II species; for Lebanon, Decision No 1160/1 General conditions on shark fishing of the Lebanese Ministry of Agriculture that aims to protect the following: *Galeorhinus galeus, Isurus oxyrinchus, Lamna nasus, Leucoroja circularis, Leucoroja militensis, Rhinobatos cemiculus, Rhinobatos rhinobatos, Sphyrna lewini, Sphyrna mokarran* and *Sphyrna zygaena* and for Montenegro, *C. carcharias*, *M. mobular* and *C. maximus* as well as several other species of sharks are protected(Official Gazette of Montenegro No. 26/15).

We can add on this issue other focal points comments done in 2013: Croatia have used their national legislation to do so for all Annex II species and Malta for White shark, basking shark and the giant devil ray

Overall, the level of protection granted to the chondrichthyan fish species listed in Annex II of the Protocol continues to be disappointingly incomplete. Only 70% of CPs that responded to the questionnaire survey reported some form of action, reports of difficulties or challenges included for three countries that responded to the question: regulatory frameworks, administrative management, technical capacity and policy framework.

II-3 – 2 Finning prohibition

Historically, The ICCAT 2004 regulation and the GFCM 2005 regulation recommend the full utilization of sharks (only head, skin and guts may be discarded). Landed fins are not to exceed 5 percent of landed shark weight. The live release of incidentally caught sharks is encouraged but not required.

In 2012, The General Fisheries Commission for the Mediterranean (GFCM) banned finning practices in the Mediterranean and Black Sea (Recommendation GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area)

To strengthen the regional ban on “finning” (slicing off a shark’s fins and discarding the body at sea), the GFCM have adopted in its Forty-second session of the Commission (FAO headquarters, Rome,

Italy, 22–26 October 2018) an EU proposal on this practice. The new Recommendation GFCM/42/2018/2 on fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3 (Annex 4), mandates that all sharks be landed with their fins naturally attached to their bodies, thereby closing loopholes that can lead to undetected finning.

The CPs were asked *"has the party Supported GFCM finning prohibition by enacting national regulations and monitoring their implementation and enforcement?"* One of the objectives of the Action plan is to ban the finning by Mediterranean countries (Art. 19). 50 % of the CPs that responded to this question reported that they had done so, with an additional 10 % (one CP) having a project on this matter under development.

Three CPs that responded to the question about difficulties encountered mentioned regulatory framework, administrative management and technical capabilities.

II-3 – 3 Protection of critical habitats for chondrichthyans

Following CPs responses and literature, there is no effective protection of critical habitats for cartilaginous fish in the Mediterranean Sea. Protection is may be indirect through GFCM recommendation GFCM/42/2018/2. In PART II "Fisheries management measures" GFCM recommends:

- Reduction of trawl fishing in coastal areas to enhance protection of coastal sharks
- Prohibition of trawl fishing activities within 3 nautical miles off the coast, provided that the 50 meters isobath is not reached, or within the 50 meters isobath where that depth is reached at a shorter distance from the coast.

II - 4 MONITORING AND DATA COLLECTION

II – 4 – 1 Scientific research analysis

CPs were asked to continuously review data and undertake new studies to clarify the status of Mediterranean endemics and large bodied species assessed as Data Deficient or Near Threatened. For this, an analyze of the bibliography on elasmobranches (all species) was undertaken.

One hundred sixty-for paper concerning elasmobranchs were published during 2014-2018 in Mediterranean Sea with an average of 32 papers/year. They cover different area and many topics. The most papers came from the Eastern Mediterranean Sea with 68 papers followed by the central Mediterranean Sea (47 papers) (Figure 5). Turkey, Lebanon and Syria produced the most publications in the eastern area, Italy and Tunisia in the central part and Spain in the western Mediterranean Sea.
Studies published concern essentially tow topics: biology/ecology and fishery/bycatch (Figure 6). There are no real studies on stock assessment. However, some works give data on species richness, population structure, catch rates, abundance and biomass for a restricted area and a few numbers of species.
Systematic and genetic studies show a significant evolution. Molecular and genetic studies provide information on better identification of species.

Studies on the 24 species listed in annex II of the Barcelona Convention and considered in Recommendation GFCM/36/2012/3 on shark's fisheries management in the GFCM area don't exceed

42 papers during 2014-2018 (Table 2). Data reported concern essentially information on capture in different zone of the Mediterranean Sea.

The increase of papers and communications on fisheries and mainly bycatch seems to be related to the implementation of programmes on this topic to reduce this phenomenon. These programmes were generally multi-taxa approach.

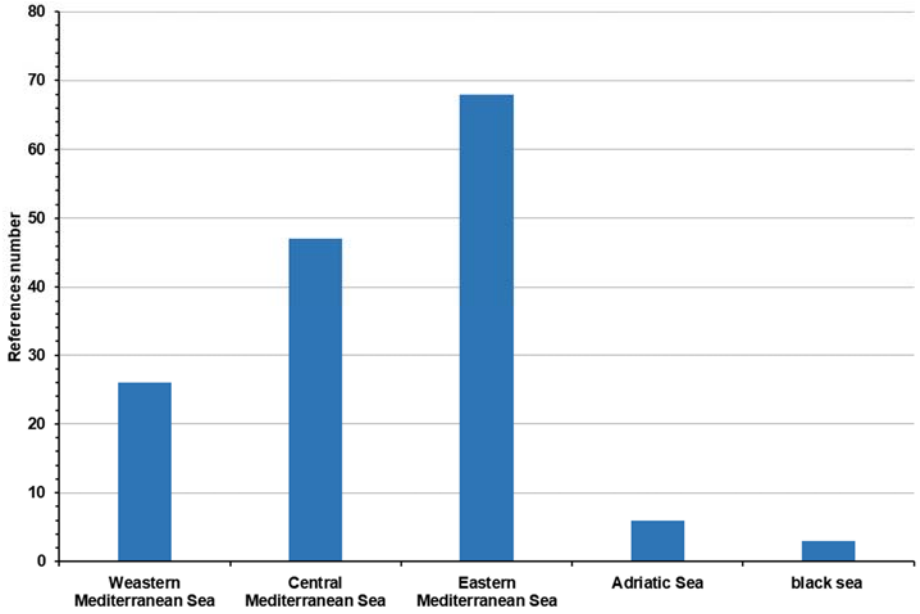

Figure 5: Geographic distribution of elasmobranchs paper in the Mediterranean Sea between 2014-2018

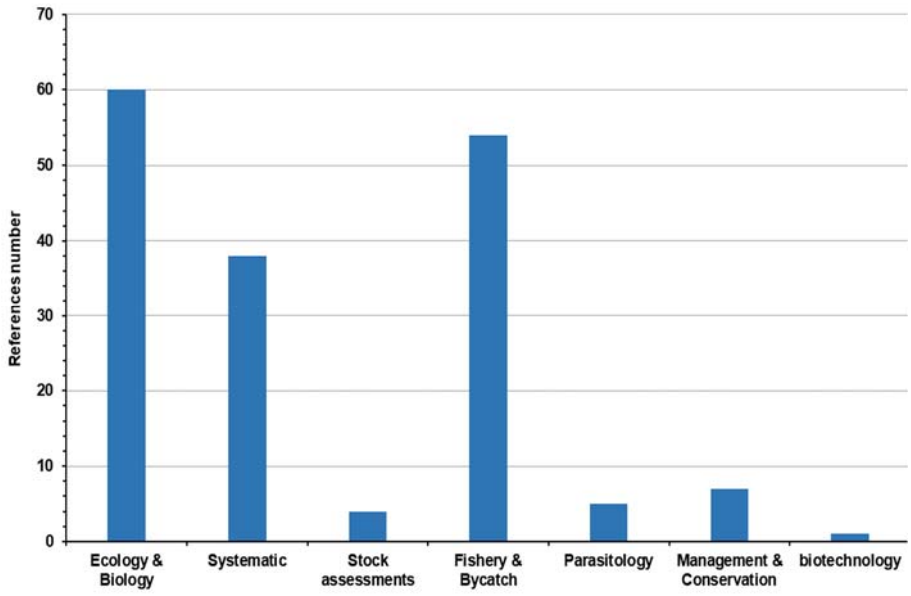

Figure 6: Distribution of elasmobranchs paper by topic in the Mediterranean Sea between 2014-2018

Table 2: Papers reporting data concerning species listed in Annex II in the Mediterranean Sea (2014-2018)

	Annex II (Protected species, fishing is prohibited in the Mediterranean Sea. The reporting of any incidental catch is mandatory)	**numbers of reference published between 2014 and 2018**	**Countries concerned**
1	*Carcharias taurus* Rafinesque, 1810	0	
2	*Carcharodon carcharias* (Linnaeus, 1758)	2	Turkey, Tunisia
3	*Cetorhinus maximus* (Gunnerus, 1765)	2	Italy, Turkey
4	*Dipturus batis* (Linnaeus, 1758)	0	
5	*Galeorhinus galeus* (Linnaeus, 1758)	1	The State of Libya
6	*Gymnura altavela* (Linnaeus, 1758)	3	Turkey, Syria
7	*Isurus oxyrinchus* Rafinesque, 1810	4	Turkey, Croatia, Malta
8	*Lamna nasus* (Bonnaterre, 1788)	0	
9	*Leucoraja circularis* (Couch, 1838)	1	Syria
10	*Leucoraja melitensis* (Clark, 1926)	1	Italy
11	*Mobula mobular* (Bonnaterre, 1788)	5	Palestine, Tunisia, Turkey, Syria, Croatia
12	*Odontaspis ferox* (Risso, 1810)	0	
13	*Oxynotus centrina* (Linnaeus, 1758)	2	Greece, Turkey
14	*Pristis pectinata* Latham, 1794	0	
15	*Pristis pristis* (Linnaeus, 1758)	0	
16	*Rhinobatos cemiculus* (Geoffroy Saint- Hilaire, 1817)	7	Tunisia, Syria, Turkey, Lebanon, Greece
17	*Rhinobatos rhinobatos* (Linnaeus, 1758)	7	Tunisia, Syria, Turkey, Lebanon, Greece
18	*Rostroraja alba* (Lacépède, 1803)	2	Tunisia

19	*Sphyrna lewini* (Griffith & Smith, 1834)	0	
20	*Sphyrna mokarran* (Rüppell, 1837)	0	
21	*Sphyrna zygaena* (Linnaeus, 1758)	0	
22	*Squatina aculeata* Cuvier, 1829	2	Turkey, Malta
23	*Squatina oculata* Bonaparte, 1840	1	Italy
24	*Squatina squatina* (Linnaeus, 1758)	2	Italy, Turkey

In another hand, a chapter titled "Overview on Mediterranean Shark's Fisheries: Impact on the Biodiversity" (Bradai et al., 2018) was published in 2018 providing an overview on the bycatch of sharks in the Mediterranean, their impact on biodiversity, problems encountered by elasmobranchs in the area are highlighted, and conservation measures are suggested (See: https://www.intechopen.com/books/marine-ecology-biotic-and-abiotic-interactions/overview-on-mediterranean-shark-s-fisheries-impact-on-the-biodiversity)

The Regional Activity Center for Specially Protected Areas (SPA/RAC) contributed in funding the publication cost of this chapter

II – 4 – 2 The MEDLEM database

The Mediterranean Large Elasmobranchs Monitoring MedLem is a monitoring programme on the captures and sightings of the large cartilaginous fishes occurring in the Mediterranean Sea. This programme directly links up with the FAO IPOA-SHARKS. The programme started officially in the 1985 (Mancusi and Serena, 2014) and adopted by FAO-GFCM in 2005 and by UNEP-SPA/RAC in the 2009. IUCN-SSG and EEA are the main partners. It provides an updated source of information on large cartilaginous fishes for national and international organizations involved in the management and the conservation of these fishes in the Mediterranean Sea (Serena *et al*., 2009). The main goal of the program is to evaluate the elasmobranchs by-catch recording the incidental catches, sightings, stranding and historical bibliographic references.

20 different countries participate in the MedLem programme (Italy, Spain, Tunisia, Greece, Croatia, Algeria, Syria, Malta, Lebanon, France, Egypt, Turkey, The State of Libya, Slovenia) and promote input and shared access to the database under the appropriate protocol. Records is clearly increasing (Table 3).

Table 3: captures and sightings of the large cartilaginous fishes occurring in the Mediterranean Sea

Years	Records	Specimens
1666- 2009	964	-
1666 -2011	1390	-
1666 - 2014	2627	2874
1666 to 2017	3000	> 4000

The MEDLEM database contributes to an improvement of the knowledge on presence, spatial distribution and by catch of large elasmobranchs species in the Mediterranean and Black seas. For this reason, it could represent a useful tool for national and international organizations (e.g. FAO-GFCM, UNEP-MAP and IUCN-SSG) involved in the management and conservation of biodiversity of the Mediterranean Sea.

MEDLEM does not have a homogeneous reporting coverage throughout the Mediterranean and Black seas and it should be considered as a database of observed species presence. Scientific monitoring efforts in the south-eastern Mediterranean and Black seas are generally lower than in the northern sectors and the absence in our database of some species from these regions does not imply their actual absence from those areas (Figure 7).

The database was hosted by The Regional Environmental Protection Agency, Toscana- Italy (ARPAT) for a long time, now MEDLEM archive, even if not fully available now, is on the GFCM server and is continuously updated (Fabrizio Serena, personnel comm.).

Next step, to reinforce MedLem, may be to provide, at documentation of the database structure level, the possibility of recording all the elasmobranchs affected to bycatch and not only those of large size.

Based on these collaborative premises, good results useful to the GFCM strategies and for the goals of the Barcelona Convention could be produced.

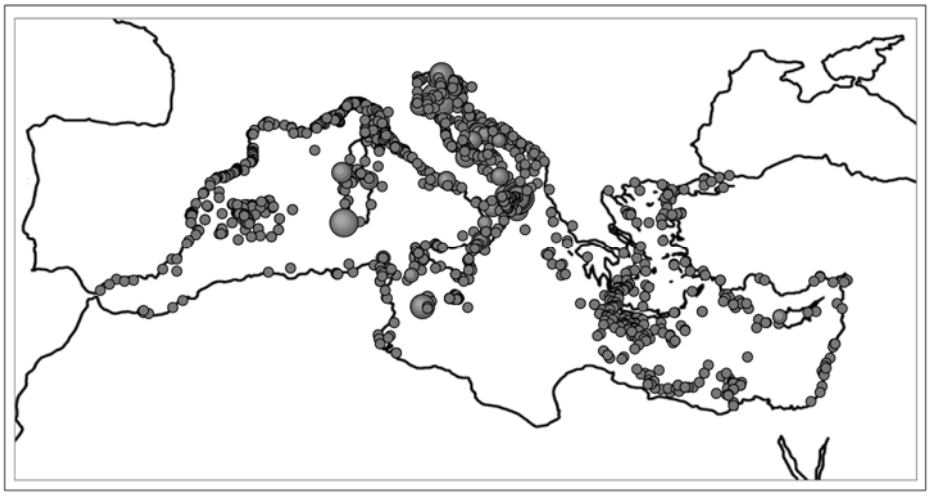

Figure 7: Records of large Elasmobranches (1666 – 2014) (Mancusi et al., 2014)

II – 4 – 3 Critical habitats for chondrichthyans

Critical habitats should be identified for conservation purposes. In fact, a big lack of knowledge on critical habitats for this group was noted in the Mediterranean and Black Sea (Bradai et al., 2012). However, some mapping of nursery areas and spawning ground for some species are being carried out by some countries. Some areas are considered as critical habitats for chondrichthyans. Investigation conducted through 2004 to 2008 in the Gulf of Gabes (southern Tunisia, central Mediterranean Sea), showed that at least four elasmobranch species use coastal water of the area as nursery. *Carcharhinus plumbeus*, *Mustelus mustelus*, *Rhinobatos rhinobatos* and *Rhinobatos cemiculus* (Bradai et al., 2005; Saidi, 2008; Enajjar, 2009 and Enajjar et al., 2015). The Tunisian waters provide also a nursery area for the white shark *Carcharodon carcharias* (center of Tunisia) (Bradai et al., 2012). However, a large knowledge on the presence of juveniles, gravid females and other biological parameters (i.e. size at first maturity) is strongly needed to identify a nursery area in order to make solid conclusions to set and implement practical spatial and/or temporal protection measures e.g. MPAs, FRAs, since the Gulf of Gabès is the most fished area in Tunisian waters. Aggregations of basking shark *Cetorhinus maximus* have been observed in the northern Balearic region, the Northern Adriatic and the Tyrrhenian Sea (Walker et al. 2005).
Given the importance of such habitats for conservation purposes, the Mediterranean Action Plan (in C.3) requests CPs the following:

- To inventory and map critical habitats
- To give legal protection to these habitats (prevent deterioration, restoration programmes, creation of MPAs…)

Ten responses were received at the question "Has the CP Completed and disseminated inventories of critical habitats (mating, spawning and nursery grounds). Two CPs (20 %) inventoried critical habitats; Italy identified spawning and nursey areas in Sardinian seas for demersal rays and sharks, but they are not now under protection and at least four elasmobranch species use coastal water of the Gulf of Gabes as nursery: *Carcharhinus plumbeus*, *Mustelus mustelus*, *Rhinobatos rhinobatos* and *Rhinobatos cemiculus*. More work is needed to delimit such nurseries. Tunisian waters of center provide also a nursery area for the white shark *Carcharodon Carcharias*. three CPs (30 %) did not do so, for four countries (40 %), investigations are under development and for one CP (10 %), the action is not applicable following all difficulties / challenges mentioned in the questionnaire.

II – 4 – 4 Programmes for data collection

In 2010-2013 the GFCM carried out a three-year research programme to improve the knowledge and assess the status of elasmobranchs in the region and continues to work in close collaboration with the regional experts to contrast sharks and rays populations' decline.

a - ACCOBAMS-GFCM Project

The ACCOBAMS-GFCM project on mitigating interactions between endangered marine species and fishing activities (2015-2016), coordinated by ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area) and GFCM (General Fisheries Commission for the Mediterranean) Secretariats, in collaboration with SPA/RAC (Specially Protected Areas Regional Activity Centre), aimed to enhance the conservation of

endangered marine species, such as cetaceans, sea turtles, elasmobranches and seabirds, and to promote responsible fishing practices in the Mediterranean through six pilot actions in France, Spain, Morocco and Tunisia.

b – Med Bycatch project

A bycatch project "Understanding Mediterranean multi-taxa 'bycatch' of vulnerable species and testing mitigation- a collaborative approach" (September 2017 – June 2020), implemented by ACCOBAMS, GFCM, SPA/RAC, IUCN-Med, Birdlife International (as coordinator), and MEDASSET and financially supported by the MAVA Foundation in three countries (Morocco, Tunisia an Turkey) is interested, among other taxa, in cartilaginous fishes.

c - Montenegrin project

Determination of Fishing Effort on Sharks by Montenegrin Marine Fisheries and Multi-Stakeholder Informing about Conservation of These Endangered Species (2016 -2018)
Funded by: The Rufford Foundation
Title of the study: Composition and abundance of shark by-catch in Montenegrin fisheries
Results published by Montenegrin Ecologists Society and Environment Programme © 2018 Author: Ilija Ćetković (2018)

The project aimed to collect data regarding diversity of shark species present in Montenegrin coastal sea (South Adriatic), their spatial distributions and interactions with fisheries within the study area. Different approaches were combined in data collection with on-board observations and interviewing fishermen/fish market actors.

d - Project MEDITS (Mediterranean International Trawl Survey)

The MEDITS survey programme (International bottom trawl survey in the Mediterranean) intends to produce basic information on benthic and demersal species in term of population distribution as well as demographic structure, on the continental shelves and along the upper slopes at a global scale in the Mediterranean Sea, through systematic bottom trawl surveys.
The programme aims at conducting coordinated surveys from bottom trawling in the Mediterranean Sea. The surveys intend to include as much as possible all the trawlable areas over the shelves and the upper slopes from 10 to 800 m depth off the coasts of the partner countries. Since 2002, the MEDITS survey is included in the European regulation related to the collection of fishery data.

Since the beginning of the project, the same sampling gear is used throughout the survey series by all teams. The standard device is a bottom trawl, including all the material and its rigging from the doors to the codend of the net.

A specific chart defines the rules for distribution of the MEDITS data. From this chart, the full access to the raw MEDITS data is guaranteed to the European Commission and the laboratories participating in the surveys.

MEDITS data are extensively used for in a large scope of topics related to the biology and ecology of the demersal populations in the Mediterranean (e.g. population biology, population diagnostics, habitat, biodiversity, population and community indicators).

The utility of such a survey programme as support for fishery management is strongly related to its ability in producing indices able to characterize the diversity of situations in the whole area and their variations and trends in time. So far, its first goal is the production of relative abundance indices and

demographic structure of mainly exploited species. Further, the programme offers a fantastic opportunity for complementary observations and studies related to biology and ecology of the demersal species and communities.

This survey continues to collect data on many taxa among them cartilaginous fishes. This programme, as suggested before, needs to be extended to the North African and Levantine countries. Contacts are launched in fact, mainly with Algeria and Tunisia. This requires the support of SPA/RAC and partners to convince relevant national and international organizations, such as EC and GFCM to do so.

II – 4 – 5 Data submission to FAO and GFCM

a - commercial catch and bycatch data submission to FAO and GFCM

The CMS Conservation Plan includes:
- Develop and implement strategies to ensure that sharks and shark products entering international trade are harvested and traded in accordance with conservation and management measures and applicable regulations including those of CITES and RFMOs.

- Implement and enforce fisheries conservation and management measures and trade regulations through effective monitoring, control and surveillance.

Nine responses were received at the question "Has the CP Increased compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and GFCM, including through increased use of observers? Four CPs (44.45%) responded by yes, two countries (22.22 %) by no. For two CPs, the action is under development and for one country (11.11 %) the action is not applicable. Main difficulties or challenges were administrative management and technical capacity.

b - Data on pelagic shark catches

On this issue, the Convention on Migratory Species MoU and Conservation Plan for Migratory Sharks requests to implement and enforce existing fisheries conservation and management measures and trade regulations on shark fisheries through effective monitoring, control and surveillance.

ICCAT recommends the conservation of thresher sharks caught in association with fisheries in the ICCAT convention area through REC.ICCAT-GFCM/34/2010/4.

This action was poorly implemented for the period 2014/2019. In fact, at the question "has the contracting party Complied with obligations under GFCM Recommendations to collect and submit data on pelagic shark catches?" only one CP (12.5 %), among 8, responded by yes. For three countries (37.5 %), the action was not implemented at all. It was under development for three other countries (37.5 %) and not applicable for one country. The main difficulties reported were Technical guidance capabilities and Financial resources.

c - Collection and reporting of data from coastal fisheries

Nine countries responded at the question "has the CP Improved programmes for the collection and reporting of data from coastal fisheries?". Four of them (44.44 %) improved such programmes, Tow (22.22 %) did not do so. The action was under development for two CPs and not applicable for one

country. Difficulties reported concerned mainly technical guidance capabilities, financial resources and administrative management.

II – 4 – 6 Support expert participation in RFMO and other relevant meetings and workshops, to share expertise and build capacity for data collection, stock assessment and bycatch mitigation

GFCM/42/2018/2 PART III 10. As appropriate, the GFCM and its CPCs should, individually and collectively, engage in capacity building efforts and other research cooperative activities to improve knowledge on sharks and sharks' fisheries and to support the effective implementation of this recommendation including entering into cooperative arrangements with other appropriate international bodies.

In this frame, the GFCM, some FAO projects and other organizations (ACCOBAMS, SPA/RAC…) support participation of Mediterranean researchers to meetings and workshops dealing with cartilaginous fishes. The following events were very interesting to improve knowledge on sharks and sharks' fisheries and to support the effective implementation of this recommendation

- **Joint CopeMed II-MedSudMed Working Group on Demersal Fisheries Resources MedsudMed/CopeMed II (14-18 September 2015 Palermo, Italy)**
  The FAO MedSudMed project "Assessment and Monitoring of the Fishery Resources and the Ecosystems in the Straits of Sicily" organized this working group on Demersal Fisheries Resources to status, among other issues, on the progress toward the appraisal of the state of demersal elasmobranch stocks and fisheries in the MedSudMed and Copemed II Project areas

- **MedSudMed Technical meeting on elasmobranchs in the south-central Mediterranean Sea FAO HQ, Rome, 20-23 October 2015**

- **Working Group on Demersal Species (GFCM HQ, Rome, Italy, 23-28 November 2015)**
  In the frame of activities carried by the Subcommittee on Stock Assessment (SCSA) of the Scientific Advisory Committee on Fisheries (SAC-GFCM)

- **MedSudMed Working Group on Demersal Fisheries Resources in the south-central Mediterranean Sea FAO HQs, Rome 07-08 November 2017**

- **The Fish Forum 2018: Forum on fisheries science in the Mediterranean and Black Sea (10 -14 December 2018). General Fisheries Commission for the Mediterranean (GFCM)**

  It is important to report that in the frame of Theme 2 "Healthy Seas & Sustainable Fisheries", 16 papers were presented on cartilaginous fishes dealing mainly with bycatch (4 oral presentations and 12 posters).

- **Meeting of the Sub-regional Committee for the Eastern Mediterranean (SRC-EM) / Scientific Advisory Committee on Fisheries (SAC) (FAO HQ, Rome, (Italy), 18 – 19 March 2019)**

- **Meeting of the Sub-regional Committee for the Central Mediterranean (SRC-CM)/ Scientific Advisory Committee on Fisheries (SAC) (FAO HQ, Rome, (Italy) 21-22 March 2019).**

II – 5. MANAGEMENT AND ASSESSMENT PROCEDURES

II – 5 – 1 National Shark Plans

The Mediterranean Action plan recommends to contracting parties the elaboration of national action Plans (cf. § C.1 "Protection", C.2 "Fisheries management"& C.3 "Critical habitats and environment"). The role of SPA/RAC is fundamental for constantly updating the MAP and for stimulating Mediterranean countries to produce their own National Plans. According to IUCN (Fabrizio Serena) and Fowler (2013), some countries elaborated in 2007- 2008 their national A P: The State of Libya, Slovenia, Croatia, Bosnia-Herzegovina and Montenegro.

In the evaluation questionnaire, the CPs were asked *"has the party Developed and adopted (where these do not exist) national Shark Plans and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch?"*

Six countries did not do so (among them Bosnia and Montenegro) and three countries responded that such elaboration is under development (Turkey, Italy and Algeria). The Egyptian national AP is also under development. The elaboration of the NAP of Turkey (Öztürk, 2018) and Egypt are in final step of the process. SPA/RAC assisted Turkey to develop the national plan of action for the conservation of cartilaginous fish. A national workshop was held on 10 March 2017 in Istanbul to outline the NAP. Concerning Slovenia, Croatia, Bosnia-Herzegovina and Montenegro, it is not a real action plan but a research program (http://www.rac-spa.org/fr/node/240), the same for The State of Libya (UNEP-MAP SPA/RAC, 2005)

II – 5 – 2 Monitor Critically Endangered, Endangered and endemic species

Contracting parties were asked to Monitor Critically Endangered, Endangered and endemic species. On this issue, 42 scientific papers reported information on 15 species of the Annex II list (62,5 % of all 24 species). Monitoring concerned 10 CPs (Table 2).

II – 5 – 3 Reports submission to the GFCM

According to Recommendation GFCM/36/2012/3, information on fishing activities, catch data, incidental taking, release and/or discarding events for shark species listed either in Annex II or III of the SPA/BD Protocol, must be recorded by the shipowners in the logbook or equivalent document. this information must be reported to the national authorities for notification to GFCM Secretariat within the annual national reporting to SAC and through the Task 1.

MEDLEM updates incidental catches of large elasmobranchs; these data may enable assessments of some elasmobranch species through the GFCM SC Stock Assessment

CPs were asked “Has the party submitted to the GFCM annual Shark Assessment Reports describing all national target and/or bycatch fisheries?”

Among the height countries that responded to this question, two responded by yes, four countries did not do so, two countries responded that such elaboration is under development and one party estimated that the action is not applicable.

II – 6. REVIEW OF PROGRESS ON THE IMPLEMENTATION OF THE TIMETABLE 2014/2019

Table 4 is based upon the responses from contracting parties and other consultees, and other sources of information and evaluates progress against the 2014–2019 Implementation timetable.

Table 4: Evaluation of progress against the 2014- 2019 implementation table

ACTIONS	PROGRESS
TOOLS	
Update directory of national, regional and international experts on chondrichthyan fishes.	Complete but will require regular updating.
2. Develop, print and distribute multilingual regional and national field identification guides and sheets for remaining priority areas: Adriatic, Aegean, Ionian (in Croatian, Albanian, Italian, Greek, Turkish); and Northwestern Mediterranean (French, Spanish).	Partial
3. Promote use of existing standard monitoring protocols and forms (SPA/RAC, FAO) for species-specific data on landings, discards and observations of threatened species;	Underway with development of new protocols
4. Update and promote protocols and programmes for improved compilation and analysis of data, for contribution to regional stock assessment initiatives.	Underway with some progress
5. Formalise/reinforce synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the GFCM.	Underway
6. Improve data on elasmobranch bycatch in national reports to GFCM, for incorporation in GFCM database	Underway
7. Undertake information campaigns, improve the provision of materials for publication, and disseminate more widely existing SPA/RAC, FAO, CMS and other relevant products to fisheries managers, researchers and the public.	Partial
8. Widely disseminate SPA/RAC guidelines and code of conduct for shark and ray recreational fishing.	Poor
9. Promote catch and release, research activity and improved reporting of catches to shark and ray recreational fishers.	Unknown but seems inexistent
LEGAL PROCESSES	
10. Establish strict legal protection for species listed in Annex II and GFCM Recommendation through national laws and regulations.	In progress

11. Establish and promote national, sub-regional and regional plans or strategies for species listed in Annexes II and III.	Poor progress
12. Support GFCM finning prohibition by enacting national regulations and monitoring their implementation & enforcement.	Relatively good
13. Monitor and protect critical habitats for chondrichthyan fishes, as soon as they are identified.	Poor progress
MONITORING AND DATA COLLECTION	
14. Promote existing research proposals developed under the SPA/RAC Action Plan to funding agencies; develop similar proposals for the Levantine basin.	Progress
15. Develop and support improved data collection efforts, particularly in southern and eastern Mediterranean	Underway
16. Promote input and shared access to the MEDLEM database under the appropriate protocol.	Good
17. Complete and disseminate inventories of critical habitats (mating, spawning and nursery grounds)	Underway
18. Increase compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and GFCM, including through increased use of observers.	In progress
19. Comply with obligations under GFCM Recommendations to collect and submit data on pelagic shark catches.	Poorly implemented
20. Improve programmes for the collection and reporting of data from coastal fisheries.	Underway
21. Support expert participation in RFMO and other relevant meetings and workshops, to share expertise and build capacity for data collection, stock assessment and bycatch mitigation.	Good relatively
MANAGEMENT AND ASSESSMENT PROCEDURES	
22. Continuously review data and undertake new studies to clarify the status of Mediterranean endemics and large bodied species assessed as Data Deficient or Near Threatened	Underway
23. Monitor Critically Endangered, Endangered and endemic species	Poor but underway
24. Submit to the GFCM annual Shark Assessment Reports describing all national target and/or bycatch fisheries	Underway

25. Develop and adopt (where these do not exist) national Shark Plans and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch.	Underway
26. Develop a Regional Shark Plan and associated fisheries management regulations outside territorial waters.	Unknown
29. Continue to implement programme for the development of stock assessments, by area and by species.	Poor

III - PROPOSALS OF PRIORITIES FOR A NEW IMPLEMENTATION TIMETABLE

The future of marine biodiversity in the Mediterranean and of sustainable fishery depends a lot on elasmobranchs. A good conservation of this fish group should be ensured.

Besides developing actions not well implemented in the period 2014 – 2019 (Table 4), we should focus on the following priorities:

- Improve shark conservation in multi-taxa approach, mainly for:
  - Bycatch reducing
  - Mapping and monitoring of critical habitats
- Improve data collection at sea and at land for a global map of species distribution in all Mediterranean area and available landing statistics;
- Develop stock assessment studies; some knowledge on biologic parameters are now available and on fishery, discussions should take to choose better methods and work on collecting missing information if necessary and define case studies to be jointly developed.
  For this kind of study available statistics (by species or at least by group of species) are necessary. For this it is necessary to develop studies on systematic (focus on genetic studies) and species identification trainings are needed.
  For stock assessment studies, more investigations should be also done:
  - On shared stocks (genetic studies)
  - Undertake studies on migration and exchange between populations by satellite tracking.

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ANNEXES

ANNEX 1

Updated Timetable (2014 - 2019) of the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea*

ACTIONS	Deadline	By whom
TOOLS		
1. Update directory of national, regional and ternational experts on chondrichthyan fishes.	By 2015	SPA/RAC, CMS Shark MOU Secretariat, IUCN SSG, RFMO Shark Working Groups
2. Develop, print and distribute multilingual regional and national field identification guides and sheets for remaining priority areas: Adriatic, Aegean, Ionian (in Croatian, Albanian, Italian, Greek, Turkish); and Northwestern Mediterranean (French, Spanish).	2014 - 2015	GFCM/FAO, MEDITS, national scientific and management bodies, regional cooperation agencies
3. Promote use of existing standard monitoring protocols and forms (SPA/RAC, FAO) for species-specific data on landings, discards and observations of threatened species;	From 2014 to 2019	National scientific and management bodies, regional cooperation agencies, MEDLEM, CMS, GFCM and FAO.
4. Update and promote protocols and programmes for improved compilation and analysis of data, for contribution to regional stock assessment initiatives.	From 2014 to 2019	National and regional agencies and advisory bodies, CMS, GFCM and FAO.
5. Formalise/reinforce synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the GFCM.	Every year	Contracting Parties
6. Improve data on elasmobranch bycatch in national reports to GFCM, for incorporation in GFCM database	From 2014 to 2019	Contracting Parties, GFCM and MEDLEM
7. Undertake information campaigns, improve the provision of materials for publication, and disseminate more widely existing SPA/RAC, FAO, CMS and other relevant products to fisheries managers, researchers and the public.	Every year	AP partners, associates and donor agencies
8. Widely disseminate SPA/RAC guidelines and code of conduct for shark and ray recreational fishing.	2014	SPA/RAC, Contracting Parties, AP partners and CMS

9. Promote catch and release, research activity and improved reporting of catches to shark and ray recreational fishers.	From 2014 to 2019	Contracting Parties, AP partners
LEGAL PROCESSES		
10. Establish strict legal protection for species listed in Annex II and GFCM Recommendation through national laws and regulations.	As soon as possible	Contracting Parties
11. Establish and promote national, sub-regional and regional plans or strategies for species listed in Annexes II and III.	2014	Contracting Parties, SPA/RAC, GFCM, CMS
12. Support GFCM finning prohibition by enacting national regulations and monitoring their implementation & enforcement.	As soon as possible	Contracting Parties
13. Monitor and protect critical habitats for chondrichthyan fishes, as soon as they are identified.	From 2014 to 2019	Contracting Parties, MEAs,
MONITORING AND DATA COLLECTION		
14. Promote existing research proposals developed under the SPA/RAC Action Plan to funding agencies; develop similar proposals for the Levantine basin.	2014	SPA/RAC, CPs, AP partners
15. Develop and support improved data collection efforts, particularly in southern and eastern Mediterranean	2014 - 2015	National and regional scientific bodies and cooperation agencies, GFCM, FAO
16. Promote input and shared access to the MEDLEM database under the appropriate protocol.	From 2014 to 2019	Contracting Parties, research institute, GFCM
17. Complete and disseminate inventories of critical habitats (mating, spawning and nursery grounds)	2015	Contracting Parties
18. Increase compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and GFCM, including through increased use of observers.	From 2014 to 2019	Contracting Parties
19. Comply with obligations under GFCM Recommendations to collect and submit data on pelagic shark catches.	As soon as possible	Contracting Parties

20. Improve programmes for the collection and reporting of data from coastal fisheries.	As soon as possible	Contracting Parties
21. Support expert participation in RFMO and other relevant meetings and workshops, to share expertise and build capacity for data collection, stock assessment and bycatch mitigation.	As soon as possible	Contracting Parties, RFMO, SPA/RAC
MANAGEMENT AND ASSESSMENT PROCEDURES		
22. Continuously review data and undertake new studies to clarify the status of Mediterranean endemics and large bodied species assessed as Data Deficient or Near Threatened	From 2014 to 2019	Contracting Parties, partners
23. Monitor Critically Endangered, Endangered and endemic species	From 2014 to 2019	Contracting Parties
24. Submit to the GFCM annual Shark Assessment Reports describing all national target and/or bycatch fisheries	Every year	Contracting Parties
25. Develop and adopt (where these do not exist) national Shark Plans and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch.	As soon as possible	Contracting Parties individually and through GFCM
26. Develop a Regional Shark Plan and associated fisheries management regulations outside territorial waters.	2015	Contracting Parties, GFCM
27. Review national and regional Shark Plans every four years	2014, 2018	Contracting Parties, GFCM
29. Continue to implement programme for the development of stock assessments, by area and by species.	2014, 2016, 2019	Contracting Parties, GFCM
30.Assessment of progress in the implementation of the Action Plan and update its timetable	2019	SPA/RAC, Contracting Parties

* As adopted by the 18th meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) and its Protocols (Istanbul, Turkey from 3 to 6 December 2014).

ANNEX 2

Implementation of the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean See (2014 – 2019)

	Regional Plan Requirements: Measures taken	**Status of implementation** Please tick the box that applies				**Difficulties/Challenges** Please tick all that apply					**Changes in the information provided in the previous report** *(please tick the box that applies)*	
		yes	No	Under development	Not applicable	Policy framework	Regulatory framework	Financial resources	Administrative management	Technical Guidance Capabilities	Yes	No
(COP Decision IG21/4)	Formalize/reinforce synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the General Fisheries Commission for the Mediterranean (GFCM)- Timeline:											
		If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)*				**On a voluntary basis**, please briefly describe difficulties/challenges and the assistance that is required (type of equipment, training or					If your answer is "Yes", please update accordingly If your answer is "No", please go to next question	
		If your answer is "No", please in the column difficulties/challenges, tick all that apply										

RAP for the conservation of Cartilaginous Fishes (Chondrichthyans)

	every year from 2014 to2019															
	Establish strict legal protection for species listed in Annex II and GFCM Recommendation through national laws and regulations – Timeline: as soon as possible															
		If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL* *link or other reference)* All the Annex II species have been included in the Spanish Red List since 2015. Spain has included *Pinna nobilis* as critically endangered in 2018.				**On a voluntary basis**, briefly pleasedescri be difficulties/challenges andf attention assistance the type o that is requireor d					If your answer is "Yes", please update accordingly If your answer is "No", please go to next question	
		If your answer is "No", please in the column difficulties/challenges, tick all that apply										
	Support GFCM finning prohibition by enacting national regulations and monitoring their implementation and enforcement-Timeline: as soon as possible															
		If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL* *link or other reference)*				**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required					If your answer is "Yes", please update accordingly If your answer is "No", please go to next question	

		If your answer is "No", please in the column difficulties/challenges, tick all that apply										
RAP for the conservation of Cartilaginous Fishes (Chondrichthyans) (COP Decision IG 21/ 4)	Complete and disseminate inventories of critical habitats (mating, spawning and nursery grounds)- Timeline: 2015											
		If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)*				**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required					If your answer is "Yes", please update rdingly acco ɒ", please go to next stion If your answer is "N que	
		If your answer is "No", please in the column difficulties/challenges, tick all that apply										
	Increase compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and GFCM, including through increased use of observers-Timeline: from 2014 to 2015											
		If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)*				**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required					If your answer isupdate rdingly acco ɒ", please go If your to next stion answer is "N que	'Yes", please
		If your answer is "No", please in the column difficulties/challenges, tick all that apply										

Comply with obligations under GFCM Recommendations to collect and submit data on pelagic shark catches. _Timeline: as soon as possible	If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)* If your answer is "No", please in the column difficulties/challenges, tick all that apply	**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required		If your answer is Yes", please update Accordingly	If your answer is "No" please go to next section
Improve programmes for the collection and reporting of data from coastal fisheries- Timeline: as soon as possible	If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)* If your answer is "No", please in the column difficulties/challenges, tick all that apply	**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required		If your answer is Yes", please update Accordingly	If your answer is "No" please go to next section
Monitor Critically Endangered, Endangered and endemic species – Timeline: from 2014 to 2019	If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)*	**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required		If your answer is Yes", please update Accordingly	If your answer is "No" please go to next section

	If your answer is "No", please in the column difficulties/challenges, tick all that apply			
Submit to the GFCM annual Shark Assessment Reports describing all national target and/or bycatch fisheries- Timeline: every year				
	If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)*	**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required	If your answer is Yes", please update Accordingly If your answer is "No" please go to next section	
	If your answer is "No", please in the column difficulties/challenges, tick all that apply			
Develop and adopt (where these do not exist) national Shark Plans and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch- Timeline: as soon as possible				
	If your answer is "Yes", **on a voluntary basis** please provide further information *(Indicate website/URL link or other reference)*	**On a voluntary basis**, please briefly describe difficulties/challenges and the type of attention or assistance that is required	If your answer is "Yes", please update accordingly If your answer is "No", please go to next question	
	If your answer is "No", please in the column difficulties/challenges, tick all that apply			

ANNEX 3

Evaluation questionnaire on the implementation of the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea (2014 - 2019)
(Action Plan partners / Experts)

TOOLS

1- For updating directory of regional experts on chondrichthyan fishes, you are kindly requested to list experts on elasmobranches you know in your country/region:

Last name	First name	Organization	Address email	Phone	Expertise	Country

2- Have you updated and promoted protocols and programs for improved compilation and analysis of data, for contribution to regional stock assessment initiatives?

Yes ☐

No ☐

If your answer is "Yes", please providing further information (links to other information...)

If your answer is "No", please briefly describe difficulties.

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3- Do you Improve data on elasmobranch bycatch in national reports to GFCM, for incorporation in GFCM database?

Yes ☐

No ☐

4- Do you promote catch and release and research activities?

Yes ☐

No ☐

If your answer is "Yes", please providing further information (links to other information...)

If your answer is "No", please briefly describe difficulties.

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LEGAL PROCESSES

5- Does strict legal protection established for species listed in Annex II of the SPA/RAC and GFCM Recommendation through national laws and regulations?

Yes ☐

No ☐

If your answer is "Yes", please providing further information (references, species...)

6- Do you support GFCM finning prohibition by enacting national regulations and monitoring their implementation & enforcement.

Yes ☐

No ☐

If your answer is "Yes", please providing further information (links to other information...).

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7- Are there critical habitats for chondrichthyans identified (mating, spawning and nursery grounds)?

Yes ☐

No ☐

If your answer is "Yes", please providing further information and precise if they are monitored and protected

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MONITORING AND DATA COLLECTION

8- Do you promote input and shared access to the MEDLEM database under the appropriate protocol?

Yes ☐

No ☐

If your answer is "No", please briefly describe difficulties.

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9- Have you increased compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and GFCM, including through increased use of observers?

Yes ☐

No ☐

If your answer is "Yes", please providing further information

If your answer is "No", please briefly describe difficulties.

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10- Are obligations under GFCM Recommendations to collect and submit data on pelagic shark catches are compiled?

Yes ☐

No ☐

11- Have you participated in collaborative research projects, of Regional importance, for the evaluation of the interaction between sharks and fishery?

Yes ☐

No ☐

Please, specify the type of projects and its objectives:

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MANAGEMENT AND ASSESSMENT PROCEDURES

12- Are data reviewed continuously and new studies undertaken to clarify the status of Mediterranean endemics and large bodied species assessed as Data Deficient or Near Threatened?

Yes ☐

No ☐

If your answer is "Yes", please providing further information

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13- Are critically Endangered, Endangered and endemic species monitored?

Yes ☐

No ☐

If your answer is "Yes", please providing further information

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14- Are national Shark Plan and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch developed?

Yes ☐

No ☐

If your answer is "Yes", please providing further information (references, species...)

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Please, add what deemed of relevance, according to your expertise, on Shark conservation, which is not included in this questionnaire:

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Kindly to provide your Bibliographic references on cartilaginous fishes for the period 2014-2019 or attach Pdf

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ANNEX 4

National implementation of the Action Plan for the conservation of cartilaginous fishes (Chondrichthyans) in the Mediterranean Sea

This table summarizes CP responses to the questionnaire circulated in December 2018

Requirement actions	**Status of implementation**				**Difficulties/Challenges**				
	Yes	No	Under development	Not applicable	Policy framework	Regulatory frame work	Financial resources	Administrative management	Technical guidance capabilities
Formalize/reinforce synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the GFCM	Lebanon* Tunisia	Bosnia H Monaco Montenegro*	Turkey IUCN Algeria	Albania*	Montenegro*	Albania*	Algeria Montenegro*	IUCN	Albania*
Establish strict legal protection for species listed in Annex II and GFCM Recommendation through national laws and regulations	Spain Turkey Italy Monaco	Algeria	Bosnia H IUCN	Albania*	Algeria	Algeria Albania*		Bosnia H Albania*	Algeria

– Timeline: as soon as possible	Lebanon* Tunisia Montenegro*								
Support GFCM finning prohibition by enacting national regulations and monitoring their implementation and enforcement	Turkey Italy IUCN Lebanon* Montenegro*	Bosnia H Algeria Monaco Tunisia	Albania*			Algeria Albania*		Bosnia H Albania*	Albania*
Complete and disseminate inventories of critical habitats (mating, spawning and nursery grounds)	Italy* Tunisia	Bosnia H Slovenia Monaco Lebanon*	Turkey IUCN Algeria Montenegro*	Albania*	Albania*	Albania*	Albania*	Albania*	Algeria Albania*
Increase compliance with obligations to collect and submit species-specific commercial catch and bycatch data to FAO and	Algeria Italy* Montenegro*	Bosnia H Monaco	Turkey IUCN	Albania*	Albania*	Albania*	Albania*	Bosnia H Albania*	Algeria Albania*

GFCM, including through increased use of observers	Tunisia								
Comply with obligations under GFCM Recommendations to collect and submit data on pelagic shark catches	Tunisia	Bosnia H Monaco Italy*	IUCN Algeria Montenegro*	Albania*	Albania*	Albania*	Bosnia H Albania*	Albania*	Bosnia H Algeria Albania*
Improve programmes for the collection and reporting of data from coastal fisheries	Albania Turkey Algeria Tunisia	Bosnia H Monaco	IUCN Montenegro*	Albania*	Albania Albania*	Albania*	Bosnia H Albania*	Bosnia H Albania*	Bosnia H Algeria Albania*
Monitor Critically Endangered, Endangered and endemic species	Turkey Italy	Bosnia H Algeria Monaco Lebanon* Montenegro* Tunisia	Albania*		Algeria Albania*	Algeria Albania*	Bosnia H Italy Montenegro* Albania*	Montenegro* Albania*	Bosnia H
Submit to the GFCM annual Shark Assessment Reports	Albania Italy*	Bosnia H Algeria	Turkey IUCN	Albania*	Algeria Albania*	Algeria	Bosnia H Albania*	Albania*	Bosnia H Albania*

describing all national target and/or bycatch fisheries		Monaco Montenegro *				Albania*				
Develop and adopt (where these do not exist) national Shark Plans and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch	IUCN	Albania Bosnia H Monaco Lebanon* Montenegro* Tunisia	Turkey Italy Algeria	Albania*	Albania Albania* IUCN Algeria	Italy Algeria Albania*	Bosnia H IUCN Montenegro* Albania*	IUCN Montenegro* Albania*	Bosnia H Montenegro* Albania*	*Expert responses

ANNEX 5

Recommendation GFCM/42/2018/2 on fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3

The General Fisheries Commission for the Mediterranean (GFCM),

RECALLING that the objectives of the Agreement establishing the General Fisheries Commission for the Mediterranean are to promote the development, conservation, rational management and proper utilization of living marine resources;

RECALLING the Johannesburg Declaration on Sustainable Development of 2002 and in particular its Plan of Implementation;

RECALLING the Declaration of the Ministerial Conference for Sustainable Development of the Fisheries in the Mediterranean held in Venice on 2003;

REAFFIRMING the principles of the FAO Code of Conduct for Responsible Fisheries and recalling the precautionary and ecosystem approach to fishery management;

RECALLING the FAO International Plan of action for the Conservation and the management of Sharks (IPOA-sharks);

RECALLING the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) and the listing of some sharks species in either Annex II or Annex III of its Protocol concerning the Specially Protected Areas and Biological Diversity in the Mediterranean (hereinafter SPA/BD Protocol);

NOTING the importance of harmonizing conservation and management measures with other international conventions responsible for the protection of these species;

TAKING INTO ACCOUNT the SAC advice and in particular the needs for species identification and to ensure better conservation status to sharks including protection of coastal areas from most active fishing gear;

ADOPTS in conformity with the provision of Article III paragraph 1 (b) and (h) and Article V of the GFCM Agreement that:

PART I
Scope

1. Contracting Parties and Cooperating non-contracting Parties of the GFCM (hereafter referred to as CPCs) shall ensure that sharks are kept on board, transshipped, landed and marketed at first sale in a way that species are recognizable and identifiable and catches, incidental takings and, whenever appropriate, releases by species can be monitored and recorded.

2. CPCs shall adopt fisheries management measures to ensure adequate conservation status to sharks.

Definitions

3. For the purposes of this Recommendation the following definitions shall apply:

‘Shark’ means any fish of the taxon *Elasmobranchii*

‘Shark fins’ means any fins of sharks including caudal fins, but excluding the pectoral fins of rays, which are a constituent part of ray wings;

‘trawl nets’ means nets which are actively towed by the main boat engine and consisting of a cone- or pyramid-shaped body (as trawl body) closed at the back by a cod-end and which can extend at the opening by the wings or can be mounted on a rigid frame. Horizontal opening is either obtained by otter boards or provided by a beam or frame of variable shape and size. Such nets can be towed either on the bottom (bottom trawl net) or in midwater (pelagic trawl net);

PART II
Fisheries management measures

4. CPCs shall ensure that:

- it shall be prohibited to remove shark fins on board vessels and to retain, tranship or land shark fins.

- in order to facilitate on-board storage, shark fins may be partially sliced through and folded against the carcass but shall not be removed from the carcass before landing.

- beheading and skinning of specimens on board and before landing shall be prohibited. Beheaded and skinned sharks cannot be marketed at the first sale markets after landing;

- It shall be prohibited to purchase, offer for sale or sell shark fins which have been removed, retained on board, transhipped or landed in contravention of this Recommendation.

5. Reduction of trawl fishing in coastal areas to enhance protection of coastal sharks

A. CPCs shall ensure that fishing activities carried out with trawl nets are prohibited within 3 nautical miles off the coast, provided that the 50 meters isobath is not reached, or within the 50 meters isobath where that depth is reached at a shorter distance from the coast.

B. Specific and spatially limited derogation may be granted by the Members on condition that affects a limited number of vessels and provided that such derogation:

a) is justified by particular geographical constraints, such as the limited size of continental shelf along the entire coastline of a Member State or the limited extent of trawlable fishing grounds due to different causes;

and/or
b) concerns small trawl vessels of less than or equal to 12 metres overall length and engine power of less than or equal to 85 kW traditionally carried out in coastal areas;

or
c) concerns a limited number of vessels during a seasonal fishing campaign;

and
d) has no significant impact on the marine environment.

C. CPCs shall inform the GFCM on the modalities of applying the derogation under point B) no later than 31 March. This notification shall include:

a) a list of authorized trawl fishing vessels with their characteristics,

b) zones as identified by geographic coordinates both on land and at sea and by GFCM statistical rectangles as defined in Recommendation GFCM/35/2011/1.

c) Measures taken to monitor and mitigate impact on marine environment

D. CPCs shall establish a specific monitoring plan for the trawl fisheries operating under derogation as stipulated by point B).

E. These provisions are without prejudice to more detailed or stricter rules implemented by Members.

Elasmobranchs species under Annex II (list of endangered or threatened species) and Annex III (list of species whose exploitation is regulated) of the SPA/BD Protocol to the Barcelona Convention

6. CPCs shall ensure a high protection from fishing activities to elasmobranches species listed in Annex II of the SPA/BD protocol of the Barcelona Convention that must be released unharmed and alive to the extent possible.

7. Specimens of sharks' species listed in Annex II of the SPA/BD Protocol cannot be retained on board, transshipped, landed, transferred, stored, sold or displayed or offered for sale.

8. CPCs shall ensure that catches of tope shark (Galeorhinus galeus) taken with bottom- set nets, longlines and in tuna traps shall be promptly released unharmed and alive to the extent possible.

PART III
Monitoring, data collection and research

9. CPCs shall ensure that:

a) information on fishing activities, catch data, incidental taking, release and/or discarding events for shark species listed either in Annex II or III of the SPA/BD Protocol, must be recorded by the ship-owners in the logbook or equivalent document, in line with requirements of Recommendation GFCM/35/2011/1 establishing the GFCM logbook;

b) this information must be reported to the national authorities for notification to GFCM Secretariat within the annual national reporting to SAC and through the Task 1;

c) any other additional measures are taken to improve data gathering in view of scientific monitoring of the species.

10. As appropriate, the GFCM and its CPCs should, individually and collectively, engage in capacity building efforts and other research cooperative activities to improve knowledge on sharks and shark fisheries and to support the effective implementation of this recommendation, including entering into cooperative arrangements with other appropriate international bodies.

11. The provisions referred to in Paragraphs 4, 5, 6, 7, 8 and 9 are without prejudice to stricter rules implemented by the CPCs.