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REPORT OF THE MEETING OF THE FOCAL POINTS OF SPA/RAC (FLORIANA, MALTA, 3-6 JUNE 2009)

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Introduction

1. At their Fifteenth ordinary Meeting (Almeria, January 2008), the Contracting Parties to the Barcelona Convention invited the Specially Protected Areas Regional Activity Centre (RAC/SPA) to hold the Ninth Meeting of Focal Points for SPAs in 2009.

2. The meeting was held at the Excelsior Grand Hotel in Floriana (Malta) from 3 to 6 June 2009, with the support of the Maltese authorities.

Participation

3. The meeting was attended by representatives of the following Contracting Parties: Albania, Arab Libyan Jamahiriya, Bosnia-Herzegovina, Cyprus, Croatia, Egypt, European Community, France, Greece, Israel, Italy, Lebanon, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Tunisia and Turkey.

4. The Coordinating Unit of the Mediterranean Action Plan (UNEP/MEDU) and REMPEC were also represented.

5. The following institutions and organizations were represented by observers: ACCOBAMS, FAO-GFCM, Greenpeace International, ISPRA, MEDASSET, MedMarAvis, MIO-ECSDE, Sea Alarm Foundation, Seagrass 2000, Shark Alliance, Stazione Zoologica Anton Dohrn, Tour du Valat, UICN, WWF MedPO.

6. RAC/SPA acted as the Secretariat of the meeting. The list of participants is contained in Annex I to this report.

Agenda item 1 Opening of the Meeting

7. Mr. Abderrahmen GANNOUN, Director of RAC/SPA, welcomed the participants and thanked the Maltese authorities for their assistance in organizing the meeting. After outlining the main agenda items, he stressed the importance of the event, noting that the meeting was required to examine the Centre's programme of activities for the next two years and the policy guidelines for the coming five years. He invited the participants to put forward specific suggestions on those issues, reminding them that they were also required to express their views on the draft revised mandate of the RAC/SPA.

8. Ms. Tatjana HEMA took the floor during the opening on behalf of the MAP coordinating Unit. She mentioned that Biodiversity is very high on the international agenda and MAP agenda. In particular in view of the Biodiversity target year in 2010 to halt biodiversity loss, Mediterranean should show and demonstrate its achievements. Important issues are expected to be discussed by the RAC SPA focal points together its partner organizations and she wishes a smooth meeting and success.

9. Mr. Peter PORTELLI, Permanent Secretary, Office of the Prime Minister of Malta, noted that Malta had been a Contracting Party to the SPA Protocol since 1988 and recognized that his country's contribution to the protection and conservation of marine and coastal biodiversity owed much to the assistance provided by RAC/SPA. With regard to marine conservation, work was proceeding on the compilation of the National Marine Protected Area (MPA) Strategy, which had led to the setting up of the national MPA steering committee. In terms of species protection, Malta had established a system of biodiversity protection and set up a system to coordinate rescue operations in stranding events, and adopted a protocol for cetacean strandings.

10. In a small country with a high population density, balancing the various and sometimes conflicting demands on the Mediterranean was not easy. Malta was conscious of the need to develop a framework for policy integration for the coastal and marine environment, which could only be achieved through mutual cooperation between the Mediterranean countries, for which the Protocol represented a key instrument. Existing collaboration could be further strengthened when specially protected areas and biological diversity were recognized as a shared environmental asset to be protected and sustained. Malta was concerned to increase its population's awareness and appreciation of the islands' rich habitats while seeking to share them with its visitors. He invited the participants in the meeting to visit Malta's numerous sites, taking away with them many pleasant memories.

11. Mr. Martin SEYCHELL, Director of the Environment of the host country, welcomed all the participants to Malta. He noted that they had in common the Mediterranean, that relatively small sea, which was an essential element in their past as well as their future. Only an innovatory and integrated approach based on a sound networking relationship could protect this heritage threatened by the action of human beings and by global warming. Herein lay the value of the Barcelona Convention as an instrument of regional cooperation in fields such as study and protection of threatened species and, more generally, the protection and rational exploitation of marine resources. Thanking RAC/ASP for its work, he wished all participants the most fruitful and rewarding meeting possible.

Agenda item 2 Rules and regulations

12. The rules of procedure adopted for the meetings and conferences of the Contracting Parties to the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution and its Protocols (UNEP/IG.43/6, Annex XI) apply *mutatis mutandis* to the current meeting.

Agenda item 3 Election of Officers

13. After informal consultations, the meeting unanimously elected the following officers:

Chairperson	Ms. Carmen MIFSUD (Malta)
Vice-Chairpersons	Ms. Claire BERGE (France) Mr. Javier PANTOJA (Spain)
Rapporteur	Mr. Aybars ALTIPARMAK (Turkey)

Agenda item 4 Adoption of the agenda and organization of work

14. The meeting adopted the provisional agenda contained in document UNEP(DEPI)/MED WG.331/1. The agenda is attached as Annex II to this report.

15. The meeting approved the organization of work proposed by the Secretariat as contained in the annotated provisional agenda of the meeting (document UNEP(DEPI)/MED WG.331/2 Rev.1).

Agenda item 5 **Status of implementation of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean**

a) Reports of the Parties on the implementation at national level of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD)

16. Following a general introduction by the Director of RAC/SPA, the Secretariat introduced document UNEP(DEPI)/MED WG.331/3 entitled "Report on the status of implementation of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, for the period January 2006-December 2007", which is a synthesis of the reports submitted by the Focal Points of RAC/SPA on the basis of the new format adopted for that purpose by the Fifteenth Meeting of the Contracting Parties (Almeria, January 2008). It emerged from this document that the results of the inventory were largely positive, both as regards the protection of species and their habitat and in terms of the reduction of negative impacts and the management of natural resources.

17. Some representatives, while welcoming these results and the quality of the work of the Secretariat, having regard to the volume of documents to be processed, justified the gaps in information with reference to the difficulties experienced by some countries in responding within the allotted time, which could be explained by the new report format adopted at the Fifteenth meeting of the Contracting Parties. A delegation provided the Secretariat with a list of proposals aimed at improving the online reporting system.

b) Progress report of the activities of RAC/SPA

18. The Secretariat described the Centre's activities since the last meeting of Focal Points, referring to document UNEP(DEPI)/MED WG.331/4 ("Progress report of the activities of RAC/SPA").

19. The Director of RAC/SPA indicated that the Centre's strategy should continue to be based on a long and medium-term vision that sought to target more closely the areas of intervention and to strengthen efficiency, but that circumstances made it necessary to take account of new parameters, such as the search for new partners, the recent Union for the Mediterranean and the imminence of important meetings concerned in particular with the environment. However, the two main thrusts of the Centre's activities remained species conservation and development of the areas to respond to the numerous threats related to human activity. It was necessary to that end to strengthen networking. It was also essential to continue to reflect on the creation of SPAMIs in the open seas, since they represented 70 percent of the Mediterranean surface. Finally, it was a matter of satisfaction that the activities of the Centre had continued to develop from one biennium to the next, despite relatively modest human and financial resources. It was moreover an additional reason for seeking new partnerships, such as that which had made it possible to complete the MedPosidonia project.

c) Proposal for inclusion in the SPAMI List

20. As foreseen in the Protocol and in application of the procedures of the Contracting Parties, four requests for inclusion on the SPAMI List, one from France (Natural Reserve of Bouches de Bonifacio), two from Italy (Marine Protected Area Capo Caccia-Isola Piana and Marine Protected Area Punta Campanella) and one from Morocco (Al-Hoceima National Park) had been received and examined by the RAC/SPA Secretariat. These requests were the subject of document UNEP(DEPI)/MED WG.331/5, which the Secretariat had presented together with information on the characteristics and legal status of each site and the protection, planning and management measures envisaged.

21. The participants recognized the value of these proposals and agreed to submit them for adoption by the Contracting Parties at their next ordinary meeting. One speaker wondered however about the desirability of authorizing or tolerating in a SPAMI activities such as underwater hunting, which are forbidden in many Mediterranean SPAs, even if the effective protection of sites obviously called for the support of the local population. ACCOBAMS Executive Secretary put the emphasis on the importance of including in the SPAMIs management plans, if not already done, mitigation measures of the interactions between cetaceans and fisheries. She offered the collaboration of the ACCOBAMS Secretariat for the preparation of a National Action Plan for the Conservation of Cetaceans for Morocco before 2010.

22. In response to a question by a delegation as to whether a country that was not yet a Party to the SPA/BD Protocol could propose the inclusion of sites on the SPAMI List, the Director of RAC/SPA said that sites proposed must meet the conditions set by the Protocol, in particular those concerning the existence of a legal protection status. He also indicated that RAC/SPA was ready to provide assistance to countries with respect to the legal protection of protected areas with a view to their possible application for inclusion in the SPAMI List.

d) Ordinary evaluation of the SPAMIs included in the List in 2001

23. The Secretariat informed the meeting of the results of the ordinary evaluation of the SPAMIs carried out in the biennium in accordance with the procedure adopted (UNEP(DEPI)/MED IG.17/10 Annex V) by the Contracting Parties, summarized in document UNEP(DEPI)/MED WG.331/Inf.3.

24. The Meeting having taken note of the conclusions recommended that the procedure for the ordinary evaluation of the SPAMIs included in the List in 2003 and 2005 should be pursued.

e) Proposals for modification of Annexes II and III to the SPA/BD Protocol

25. The Secretariat introduced document UNEP(DEPI)/MED WG.331/6, noting that the proposed changes concerned, on the one hand, the nomenclature of species already included in the annexes to the Protocol and, on the other, the inclusion of new species identified and evaluated by groups of experts established by RAC/SPA.

26. In the discussion on this agenda item, all the Parties approved the taxonomic amendments. However, several delegations indicated that they needed time to consult with their national experts before adopting a position on the proposed inclusions. The representative of the European Commission expressed scrutiny reservations, explaining that according to the established procedures the proposed modifications should be examined at community level via a decision of the Council.

27. After examining the proposed amendments with respect to each taxonomic group (macrophytes, birds, and cartilaginous fish), the meeting adopted the list of birds proposed for inclusion in Annex II to the SPA/BD Protocol and decided to propose the modifications appearing in Annex IV of the present report for adoption by the Contracting Parties. It was however agreed that the Parties could if they wished consult with their national experts with a view to expressing their position on the proposed amendments to RAC/SPA or at the forthcoming meeting of the MAP Focal Points (Athens, 7-10 July 2009).

28. It was noted at the end of the discussion of this agenda item that, in accordance with the provisions of the Protocol, proposed amendments to the Annexes should emanate from the Parties and that the proposed amendments to the Annexes submitted to the present meeting had been prepared by RAC/SPA in accordance with the mandate given it by the last ordinary meeting of the Contracting Parties.

f) Draft Mandate for the Regional Activity Centre for Specially Protected Areas

29. The Director of RAC/SPA, introducing document UNEP(DEPI)/MED WG.331/15, said that the draft mandate derived from the 1995 Protocol to the Barcelona Convention and concerned essentially the Centre's objective and mission, the expanded scope of its action, its principal activities, its role in improving the visibility of MAP, and the sources and mechanism of its financing

30. The representative of MEDU noted that the draft mandate was in line with the Governance Paper established by the Contracting Parties and was destined to form part of an integrated decision approving the mandates of all the MAP components.

31. The Meeting took note of the draft mandate, contained in Annex V of the report, to be submitted to the Contracting Parties.

Agenda item 6 Inventorying, mapping and monitoring marine and coastal biodiversity

32. The Vice-Chairperson (France), standing in for the Chairperson (Malta), invited the Secretariat to described the inventorying and mapping activities undertaken and introduced the documents UNEP(DEPI)/MED WG.331/Inf.5 and UNEP(DEPI)/MED WG.331/Inf.6.

33. The representatives in their majority paid tribute to the work of synthesis carried out by the Secretariat. Several speakers thanked RAC/SPA for the assistance provided to many countries, with the support of various partners, for the establishment and updating of the mapping of Posidonia meadows, while stressing the need for increased efforts with regard to training and the modernization of the techniques and means deployed.

34. The representative of Italy stressed the major effort by the Italian Government to carry out a comprehensive inventory of these formations and verify that all the elements transmitted had effectively been received and integrated by the Secretariat, which had responded positively on this point.

35. The representative of Slovenia pointed out the importance of mutual cooperation and assistance between Parties and paid tribute to the Principality of Monaco for their support to the inventorying and mapping of the Slovenia marine and coastal biological diversity and reported on the good results.

36. An observer referred to an interesting initiative by the fishermen of the Greek Island of Andros, who had decided to collaborate in the protection of the meadows in their fishing zones. Greenpeace had registered a complaint with the European Community against four member countries (France, Greece, Italy and Spain) for failure to respect the legislation designed to protect Posidonia meadows.

37. The representative of Cyprus announced the approval of a co-funded project by the Government of Cyprus and EU through Fisheries Fund, for the mapping of Posidonia around the Island. The project is to be realised under the National Strategic Action Plan for Fisheries.

38. In response to the concerns expressed regarding the gaps in identifying the multiple sources of information, the Secretariat declared itself ready to receive all new information made available for integration in the data collection. The Director of RAC/SPA took the floor to support that commitment, noting that the inventory was a long-term task but that every effort would be made to ensure that compliance with the data communicated by the authorities of the countries concerned.

Agenda item 7 Protecting sensitive habitats, species and sites

a) Activities concerning the Specially Protected Areas

39. The Secretariat informed the Meeting of activities relating to the establishment and management of protected marine and coastal areas, referring to the relevant sections of document UNEP(DEPI)/MED WG.331/4. It also presented the draft regional work programme concerning the protected areas drawn up in association with a number of partner organisations and contained in document UNEP(DEPI)/MED WG.331/7, the ultimate aim being to create "ecological representative MPA network in the Mediterranean". This programme contained in Annex VI of this report provides among other things for reflecting on representativeness, problems of the establishment and management of protected areas, and training activities.

40. The meeting also heard presentations by the representatives of partner organisations in this initiative – ACCOBAMS, IUCN, WWF MedPO and MedPAN – on their respective activities relating to the regional work programme objectives. The programme was discussed and amendments have been made according to the meeting proposals (Annex VI).

41. The Secretariat went on to deal with the activities initiated by RAC/SPA under this programme and introduced document UNEP(DEPI)/MED WG.331/Inf.4 concerning the preliminary results of the questionnaire sent to the National Focal Points and informed the meeting that the late arrival of certain items of information had prevented their inclusion in this document.

42. Several participants mentioned the difficulties encountered in completing the questionnaire because of the ambiguity of certain of the terms and concepts employed and stressed the need to clarify what an MPA really is.

43. Introducing document UNEP(DEPI)/MED WG.331/Inf.7, the Secretariat said that the Joint Management Action of the European Community with UNEP/MAP on the identification of possible SPAMIs in the open seas beyond national jurisdiction envisaged a two-phase process to promote the establishment of a representative ecological network of protected areas in the Mediterranean. The first phase was including a feasibility assessment to identify areas beyond national jurisdiction that qualified as SPAMIs on the basis of sound science. A Steering Committee, which had held its first meeting in Tunis in March 2009 (UNEP(DEPI)/MED WG.331/Inf.8), was working in conjunction with the European Community on a tentative list of potential SPAMI open-sea sites to be further screened with the Parties participation.

44. The project was welcomed by the participants. One representative reported that his country was already collaborating with the European Union in that regard, and another offered to share his country's relevant experience in the field with RAC/SPA. However, some participants thought that information on the project should have been provided to them at an earlier stage. One representative insisted on the need for close consultation with the governments concerned in the framing and development of projects of that kind,

with particular reference to compliance with legal formalities and coordination of data collection.

45. The Secretariat noted in reply that the joint project had in fact commenced only recently. The representative of MAP pointed out that the project was so far mainly restricted to the identification of possible SPAMIs in the high seas and that it would be for the countries concerned to decide in due course how they wished to proceed with the information provided. The priority concern at the present stage was data collection and a methodological approach.

46. It was agreed that the recommendation on this question should make reference to the need to promote exchanges of information.

47. Introducing document UNEP(DEPI)/MED WG.331/8, the Secretariat highlighted the main provisions of the "Draft guidelines for the creation and management of Specially Protected Areas for marine turtles in the Mediterranean", namely selecting the areas to protect, legislation and enforcement, management of nesting beaches and adjacent seas, selecting areas for setting up hatcheries, and setting up marine protected areas for turtles.

48. Various participants referred to the impact of some environmental parameters on sexual differentiation, emphasizing the need to protect beaches that are the most suitable for the conservation of turtle population. The importance of turtle tracking was emphasized – in order to identify wintering and feeding zones, to provide protection in the course of large-scale migrations, and to gather data on the observed northward trend in migratory movements.

49. Reference was also made to the need to promote small projects so as to create a research dynamic in the Mediterranean countries, and to address the problem of by-catch of turtles by focusing on appropriate messages to the fishing community and the public in general and on projects based on spatial modelling planning.

b) Implementation of Action Plans adopted in the framework of MAP

50. The Secretariat presented for each action plan a synthesis of the activities pursued and the associated documents referring to the relevant sections of document (UNEP(DEPI)/MED WG.331/4).

51. The Secretariat presented the results of the evaluation of the implementation of the Action Plan for the management of the monk seal, referring to the relevant sections of the document (UNEP(DEPI)/MED WG.331/Inf.9). It stressed that the efforts had been focused on improved knowledge, the training of national experts and collaboration with countries in identifying critical habitat of the species. For the planned actions of RAC/SPA would assist certain countries to acquire camera-traps and a meeting would be organized to prepare sub-regional plans for the recovery of the species, in collaboration with the Bern and Bonn Conventions.

52. With regard to the results of the RAC/SPA Action Plan since 2005, based on the responses to the questionnaire addressed to countries and the information derived from national reports, shortcomings exist with regard to surveillance and control of populations, particularly with regard to interactions with fishing, which would justify an increased effort to raise awareness of the problems confronting this threatened species

53. Several representatives pointed out that the areas most favourable to reproduction of the species existed in their territorial sea, but that no population had been observed there recently. On the other hand, the representative of Greece had indicated that her country

was finalizing at the end of the month a LIFE project aimed at mitigating the adverse effects of fishing on the monk seal populations.

54. In conclusion, the Director of RAC/SPA expressed the view that such an alarming report possibly justified a review of the Action Plan, with a view to taking specific initiatives. This would require proper monitoring of the species situation, in close consultation with the Bern and Bonn Conventions.

55. The Secretariat presented the activities under the Action Plan for the conservation of cetaceans in the Mediterranean, implemented in collaboration with ACCOBAMS, as contained in section 2.6 of document (UNEP(DEPI)/MED WG.331/4) and the most recent updating made to the database on cetacean strandings in the Mediterranean (MEDACES), as described in document UNEP(DEPI)/MED WG.331/Inf.10.

56. A major problem mentioned by several representatives concerned the number of strandings of dolphins recently observed, not to mention the interferences with fishing. In this respect, the devices designed to repulse the cetaceans seemed ineffective, counterproductive and even harmful. Moreover, ACCOBAMS Scientific Committee was hardly favourable to such methods, which could ultimately have the effect of driving away species from their habitat, and rather advocated modifying fishing techniques, which obviously presupposed a substantial effort to raise awareness among those concerned.

57. The executive secretary of ACCOBAMS thanked RAC/SPA for its activities undertaken within the framework of Cetacean conservation, especially in the countries not yet Parties of the agreement and has invited Bosnia-Herzegovina, Israel and Turkey to start their ratification process for the next meeting of the Contracting Parties of ACCOBAMS (Monaco, 9-12 November 2010).

58. In addition some country representatives expressed the need to develop guidelines on live stranded cetaceans. ACCOBAMS informed the meeting that the Agreement is already working to prepare them.

59. With regard to the Action Plan for the conservation of marine turtles in the Mediterranean (document UNEP(DEPI)/MED WG.331/Inf.9), the Secretariat described the use of satellite tracking systems to study the migratory routes of marine turtles and the assistance provided to five countries for data collection on the turtle nesting sites with a view to creating protected areas. The Secretariat went on to inform the meeting on the organization of the Third Mediterranean Conference on marine turtles held in Tunisia in collaboration with the Secretariats of the Bern and Bonn Conventions and the INSTM (Tunisia). Furthermore, draft Guidelines for the development of marine turtle strandings networks of and protocols for data collection were described (document UNEP(DEPI)/MED WG.331/9). Finally, the Secretariat submitted the application of six organizations (CWS, EGA, INSTM, MEDASSET, PETROL Slovenian Energy Company and the Zoological Station Anton Dohrn of Naples) that wished to be granted the status of Action Plan Partners.

60. Many speakers referred to the problems of caring for and rehabilitating wounded turtles, stressing the value and effectiveness of programmes designed to train fishermen on veterinary knowledge, among others. Others stressed the need to harmonize information and conservation efforts. A representative indicated that his country had developed very effective data collection software on veterinary treatment that he could make available to any interested individuals, through RAC/SPA.

61. An observer stressed the problems of population concentration and imbalance and the destruction of habitats, which would require a system of rapid alert and evaluation.

62. The Secretariat indicated that training efforts should focus in the first place on the follow-up of populations and the rehabilitation of injured animals. It gave an assurance that the recommendations of the Tunis meeting would be widely circulated.

63. The Director of RAC/SPA took the floor to express satisfaction at the cooperation with the Cyprus and Naples Centres. He hoped that the efforts would be pursued to improve and develop the various training programmes related to this species, with the effective help of national associations and institutions.

64. The Secretariat introduced the Action Plan for the conservation of marine vegetation in the Mediterranean Sea and presented the results of the MedPosidonia Project (UNEP(DEPI)/MED WG.331/Inf.11). The Project, aimed at inventorying, mapping and monitoring Posidonia meadows in four Mediterranean countries (Algeria, Libya, Tunisia and Turkey) had been made possible through the kind support of the Total Corporate Foundation and the collaboration of the four partner countries.

65. Support for the project was expressed by a number of participants. Several highlighted the need to promote local expertise to enable the project to put down roots at the country level. It was suggested that the experience derived from its implementation could serve in the development of projects concerning other biodiversity components.

66. Several delegations had expressed the wish that their countries might be involved in the second phase of the project, which could be extended to include other habitats of importance for biodiversity conservation and other countries and sites.

67. The Secretariat also presented the request submitted by Okianos - a private enterprise active in the field of environmental expertise and training - to be granted the title of Action Plan Partner, in accordance with articles 25 and 26 of the Action Plan.

68. The Secretariat introduced the activities undertaken by the Centre to implement the Action Plan for the Conservation of Cartilaginous Fish. They included promotion of the sub-regional implementation of the Action Plan in the Adriatic; preparation of a support document for the North and Central Adriatic Sea countries, with international and local experts' participation; analysis of the status of implementation in the countries concerned; and support for the preparation of programmes of work for the elasmobranches in their territorial waters (UNEP(DEPI)/MED WG.331/Inf.12). The representative of Lebanon requested RAC/SPA's assistance in assessing the state of cartilaginous fish in her country through conducting research, inventory, monitoring and training.

69. The meeting was provided with a regional overview and technical guidelines to improve national legislation and regulations concerning cartilaginous fish conservation and management (UNEP(DEPI)/MED WG.331/10). A review carried out in Spring 2009 had shown implementation of the Action Plan for the Conservation of Cartilaginous Fishes in the Mediterranean Sea (UNEP(DEPI)/MED WG.331/Inf.13) to be deficient at regional and national level despite the critical situation of the elasmobranches populations in the Mediterranean and the provision by RAC/SPA of necessary tools and support in accordance with the implementation calendar. A representative stressed the need to improve Parties legislation at national levels and to increase efforts to protect elasmobranches.

70. The Secretariat finally presented proposals to update the Action Plan's Implementation Timetable.

71. Action to stem the disappearance of cartilaginous fishes was deemed a priority by numerous participants. Approaches should be made to the EU to provide more support to the sector, with particular reference to data collection.

72. The crucial role of fisheries in the provision of data and management of resources was emphasized. The preparation of guidelines to fisheries on good practices was suggested. The Secretariat recalled that the topic was in the new calendar, but would be emphasised. The representative of Malta stressed the fact that few countries, except hers, have yet developed legal measures for the conservation of cartilaginous fishes.

73. The Meeting approved the draft implementation timetable for 2010-2013 contained in Annex X of this report.

74. Further to requests for Partner (IUCN-Shark specialist Group, Italian Selaceans Group (GRIS) and Shark Alliance) and Associate (Pew Environment Group) status in relation to the Action Plan. The representative of the Shark Alliance and Pew Environment Group described spheres of activity of the organizations concerned and possible modalities of cooperation with RAC/SPA in the implementation of the Action Plan. Itlaly informed the meeting about ongoing research activities on selaceans with funding from the Ministry of Environment.

75. The Secretariat summarized the activities undertaken within the framework of the Action Plan for the conservation of bird species listed in Annex II of the SPA/BD Protocol, including: assistance to Libya and Tunisia to carry out their winter bird census; to Syria for elaboration of the national action plan for the conservation of marine and coastal bird species; and to Montenegro for the production of the document on the Dalmatian Pelican (*Pelecanus crispus*) and its state of conservation in Montenegro, Albania and Greece (UNEP(DEPI)/MED WG.331/Inf.14).

76. Presenting the Draft Guidelines for reinforcing laws and regulations for the conservation and management of birds (UNEP(DEPI)/MED WG.311/11), drawn up in collaboration with the *Conservatoire de l'Environnement Littoral et des Rivages Lacustres* (CELRL), the Secretariat said that the document contained general recommendations as well as specific recommendations concerning four main fields: conserving, managing and restoring bird species; conserving, managing and restoring the habitats of bird species; information and awareness measures for the various actors; integrating measures for the conservation of bird species and habitats within coastal and marine planning processes. Finally, the Secretariat submitted the application of the Conservatoire du Littoral (France) for the granting of the title of Action Plan Partner.

77. Several participants thanked RAC/SPA for its assistance, stressing the value of the draft guidelines. The items of nuisance from tourism, changes of land use (e.g. permanent constructions) and invasive alien species like rats on islets were discussed also as other important activities to be addressed in the future.

78. The Secretariat presented the activities undertaken in the framework of the Action Plan for the Coralligenous and other Calcareous Bio-concretions in the Mediterranean, together with the results and recommendations of the First Mediterranean Symposium on the Coralligenous and other Calcareous Bio-concretions, held in Tabarka (Tunisia) from 14 to 16 January 2009 in collaboration with the RAMOGE Agreement and Okianos.

Agenda item 8 **Assessing and mitigating the impacts of threats to biodiversity**

79. Under this agenda item the Secretariat referred to the whole range of activities undertaken in the framework of the Action Plan concerning species introduction and invasive species in the Mediterranean (document UNEP(DEPI)/MED WG.331/4). The meeting was informed of training, information and follow-up activities undertaken with RAC/ASP partners (in particular with REMPEC and ACCOBAMS) with a view to reducing the impact of fishing on sensitive habitats and endangered species, combating the effects of pollution and managing more effectively ballast waters (under the GloBallast Partnerships Project). The implementation of the Action Plan on species introductions and invasive species was continuing with the organization of a training course in Egypt and the publication of two important technical tools concerning the introduction of non-indigenous species in the Mediterranean. Italy informed the meeting that in accordance to Siracusa Declaration, the Italian Ministry had funded the databank on alien species of IUCN.

80. Pursuant to the Almeria Declaration, RAC/SPA has undertaken a process consisting of in-depth studies involving relevant ministries in all the riparian countries with a view to assessing the state of knowledge on the impact of climate change on Mediterranean marine and coastal biodiversity. An initial synthesis deriving from three sub-regional meetings and 20 ad-hoc documents was submitted in mid-December 2008 to a meeting convened to discuss the final recommendations and conclusions of the exercise at the regional level.

81. The importance of the impacts of climate change on Mediterranean marine biodiversity was emphasised by several speakers. Following a debate on intervention priorities, the meeting underlined the value of monitoring the impact of these changes on biodiversity and to work on the aspects of mitigation and adaptation, as reflected in the document on SAP BIO update on climate change issues (UNEP(DEPI)/MED WG.331/13). The meeting stressed the need to take into account all relevant international initiatives, such as the MedChange European project.

Agenda item 9 **Developing research to supplement knowledge and fill in gaps on biodiversity**

82. The Secretariat reported that the Centre's website had been redesigned and was continuously updated to ensure better contact with the Focal Points, Member States and the general public. The Mediterranean Geographical Information System (MedGIS) had been made available online, and it was now possible to download national georeferenced data on marine and coastal biodiversity features (such as protected areas and key-habitats distribution). The enhanced RAC/SPA website also provided access to regional bibliographical databases, comprising scientific and technical documents, reports of meetings, and a variety of other information sources and illustrative materials, and contained indicators on the state of Mediterranean biodiversity.

Agenda item 10 **Training, coordination and technical assistance**

83. The Secretariat provided information on regional training actions carried out during the biennium to improve capacity building in terms of conservation techniques, monitoring, surveillance and evaluation of biodiversity, or the prevention of threats on the basis the information provided in document UNEP(DEPI)/MED WG.311/4.

84. There was unanimous appreciation of the training provided by RAC/SPA, which was described as one of the Centre's key functions. Reference was made to the importance of follow-up activities, in particular ensuring feedback from trainees. It was important, in the view of one participant, to distinguish between training and capacity building - the latter

implying human and technical resources. Consideration might be given to placing contributions to training sessions on the RAC/SPA website.

85. The Secretariat said that an effort would be made to include more material on the website, but the Centre was limited by the lack of a dedicated website staff member.

Agenda item 11 RAC/SPA Programme-budget for 2010-2011

86. The Secretariat presented the programme of activities of the RAC/SPA and the proposed budget 2010-2011 referring to document UNEP(DEPI)/MED WG.311/14.

87. The Director of RAC/SPA set out the main lines of the programme and budget, the overall aim of which was to create a network of SPAs and to check the erosion of biodiversity in the Mediterranean by focusing on five main axes or groups of activities: the pursuit of inventories of biodiversity, the conservation of threatened species and the protection of sensitive sites, the reduction of threats to biodiversity, the sharing of knowledge and information at the regional level and, finally, the promotion of awareness and development of skills among national actors. He noted that the programme formed part of the objectives of the SAP BIO.

88. As regards financing, he noted that the annual budget had practically doubled from one biennium to another thanks to external financing, increasing roughly from one to € 2.5 million, which at the same time entailed an increase in the volume of activities that was difficult to manage with current staffing. Hence the need to further staff recruitment in order to implement these projects, as planned.

Agenda item 12 Any other matters

89. The French Delegation pointed out that the Union for the Mediterranean, co-chaired by Egypt and France, was a new initiative that intended to give real political impetus to regional efforts in favour of sustainable development in full harmony with existing institutions, including MAP. She emphasised that the protection of marine bottoms and in particular those of the Mediterranean is one the priorities quoted in the Declaration of the 4 November 2008 Foreign Affairs Ministers Conference. This Declaration specified also that the assessment of the processes leading to the elaboration of a maritime policy would play a special role in 2009.

Agenda item 13 Adoption of the Meeting Report

90. The Meeting examined the draft report prepared by the Secretariat, introducing the amendments deemed necessary and adopted it. The Meeting adopted the draft decisions and recommendations contained in Annex III of the report as well as all the report's other Annexes.

Agenda item 14 Closure of the Meeting

91. After the customary exchange of courtesies, the meeting was closed by the Chairperson on Saturday, 6 June 2009 at 4.50 p.m.

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Annex II - Agenda

Agenda item 1 - Opening of the Meeting

Agenda item 2 - Rules of Procedure

Agenda item 3 - Election of Officers

Agenda item 4 - Adoption of the Agenda and organisation of work

Agenda item 5 - Status of implementation of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean

Agenda item 6 - Inventorying, mapping and monitoring marine and coastal biodiversity

Agenda item 7 - Protecting sensitive habitats, species and sites

Agenda item 8 - Assessing and mitigating the impacts of threats to biodiversity

Agenda item 9 - Developing research to supplement knowledge and fill in gaps on biodiversity

Agenda item 10 - Training, coordination and technical assistance

Agenda item 11 - Programme-Budget of RAC/SPA for 2010-2011

Agenda item 12 - Any other matters

Agenda item 13 - Adoption of the Report of the Meeting

Agenda item 14 - Closure of the Meeting

Annex III - Recommendations and decisions

Proposed Decisions

The meeting approved to submit decisions proposals concerning the following subjects :

- Inclusion of 4 new SPAs on the List of Specially Protected Areas of Mediterranean Importance (SPAMIs).
- Implementation by the Parties, with the support of RAC/SPA and relevant organizations, of the Work Programme concerning coastal and marine protected areas in the Mediterranean region, including on the High Seas - Open seas, including deep seas.
- Amendments to Annexes II and III to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol).
- Revision of the calendar of implementation (2010-2013) of the Action Plan for the Conservation of Cartilaginous fishes in the Mediterranean Sea.

Draft Recommendations:

Objective 1: Inventorying, mapping and monitoring of marine and coastal biodiversity in the Mediterranean

In order to evaluate the status of the biodiversity at the regional level, efforts made by all the users (Parties, RAC/SPA, partners, scientific community, etc...) must be reinforced to update the available information concerning the distribution and the monitoring of marine and coastal biodiversity.

Objective 2: Conservation of the habitats, species and significant sites

Recommendations to Parties:

- To undertake the ordinary evaluation of the SPAMIs included on the List in 2003 and 2005.
- To adopt the following guidelines
    - Guidelines for setting up and management of Specially Protected Areas including key habitats for marine turtles in the Mediterranean Sea
    - Guidelines for developing marine turtles stranding networks and for data collection protocols
    - Guidelines for reinforcing laws and regulations for the conservation and management of cartilaginous fish

  - Guidelines for reinforcing laws and regulations for the conservation and management of bird species listed in Annex II and III of the SPA/BD Protocol
- To grant the title of Partner of the Action plan of the following organizations:
  - Cyprus Wildlife Society (CWS), Environmental General Authority (EGA-Libye), Institut National des Sciences et Technologies de la Mer (INSTM), MEDASSET, PETROL - Slovenian Energy Company and Zoological Station Anton Dorh of Naples / Action Plan for the conservation of Mediterranean marine turtles
  - Okianos / Action Plan for the conservation of marine vegetation in the Mediterranean Sea
  - Gruppo Ricercatori Italiani sugli Squali, razze e chimera – GRIS, Società Italiana di Biologia Marina, IUCN Shark Specialists Group and The Shark Alliance / Action Plan for the Conservation of Cartilaginous fishes in the Mediterranean Sea
  - Conservatoire de l'Espace Littoral et des Rivages Lacustres (CELRL) / Action Plan for the conservation of bird species listed in annex II of the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean
- To grant the title of Action Plan Associate to the following organization
  - Pew Environment Group (Action Plan for the Conservation of Cartilaginous fishes in the Mediterranean Sea)
- To take note of the recommendations of the First symposium on Coralligenous and other calcareous bioconstructions.

Objective 3: Evaluation and reduction of the impact of the threats to biodiversity

Recommendations to Parties:

- To make the best use of the available reports on climate change, to develop activities at countries and region levels to confront and to monitor the impacts of climate change on the Mediterranean marine and coastal biodiversity.
- To adopt the following guidelines
  - Guidelines for reducing by catch of seabirds in the Mediterranean region

Objective 4: Development of research to improve knowledge and fill gaps with respect to biodiversity

Recommendations to Parties:

- To provide RAC/SPA with available oceanographic means to implement its oceanographic survey campaigns in suitable candidate SPAMIs on the High Seas - Open seas, including deep seas-.

Recommendations to RAC/SPA:

- To update the RAC/SPA's databases and develop new ones for each action plan.

Objective 5: Capacity building to improve coordination and technical assistance

Recommendations to Parties:

- To support with national involvement and sub-regional collaboration frames the RAC/SPA training activities on MPAs creation and management planned within the MedMPANet project (2009-2013).

Annex IV - Proposals for amendment of Annexes II and III of the SPA/BD Protocol

The Ninth Meeting of Focal Points for SPAs (Floriana (Malta), 3-6 June 2009) decided to propose the following modifications and amendements concerning the species listed on annex II (Table I) and III (Table II) hereafter for adoption by the Contracting Parties.

The meeting accepted the taxonomic changes made on the Annex II and III respectively and the list of birds proposed for inclusion on Annex II of the SPA/BD Protocol as it is shown herebelow (Table II). The European Commission expressed scrutiny reservations, explaining that according to the established procedures the proposed modifications should be examined at Community level via a decision of the Council.

For the other taxonomic groups it was agreed that the Parties could if they wished consult with their national experts with a view to expressing their position on the proposed amendments, either to RAC/SPA or at the forthcoming meeting of the MAP Focal Points (Athens, 7-10 July 2009).

List of endangered or threatened species – Annex II. * Amendments made according to taxonomic changes; # Species included in the Annex in 2009; [ ] : For the species put in square brackets the meeting of the national Focal Points for SPAs agreed that the Parties could if they wished consult with their national experts with a view to expressing their position on the proposed amendments, either to RAC/SPA or at the forthcoming meeting of the MAP Focal Points (Athens, 7-10 July 2009). The final decision for inclusion or not of these species will be decided during the 16th meeting of the Contracting Parties.

Magnoliophyta
[Cymodocea nodosa (Ucria) Ascherson#]
Posidonia oceanica (Linnaeus) Delile
Zostera marina Linnaeus
Zostera noltii Hornemann
Chlorophyta
Caulerpa ollivieri Dostál

Heterokontophyta
[1]Cystoseira genus (except *Cystoseira compressa*) *[Fucus virsoides* J. Agardh#] *[Gymnogongrus crenulatus* (Turner) J. Agardh#] *[Kallymenia spathulata* (J. Agardh) P.G. Parkinson#] *[Laminaria rodriguezii* Bornet#] *[Sargassum acinarium* (Linnaeus) Setchell#] *[Sargassum flavifolium* Kützing#] *[Sargassum hornschuchii* C. Agardh#] *[Sargassum trichocarpum* J. Agardh#] *[Sphaerococcus rhizophylloides* J.J. Rodríguez#]
Rhodophyta
lithophyllum byssoides* (lamarck) foslie* (synon. L*ithophyllum lichenoides*)** *Ptilophora mediterranea* (H. Huvé) R.E. Norris *Schimmelmannia schousboei* (J. Agardh) J. Agardh *[Tenarea tortuosa* (Esper) Lemoine#] ***Titanoderma ramosissimum* (heydrich) Bressan & Cabioch* (synon. G*oniolithon byssoides*)** ***[Titanoderma trochanter* (bory) Benhissoune *et al.#]
Porifera
Aplysina sp. plur. *Asbestopluma hypogea* Vacelet & Boury-Esnault, 1995 *Axinella cannabina* (Esper, 1794) *Axinella polypoides* Schmidt, 1862 *Geodia cydonium* (Jameson, 1811) *Petrobiona massiliana* (Vacelet & Lévi, 1958) *Sarcotragus foetidus* Schmidt, 1862* (synon. *Ircina foetida*) S*arcotragus pipetta* (Schmidt, 1868)* (synon. *Ircinia pipetta)* Tethya sp. plur.
Cnidaria
Astroides calycularis (Pallas, 1766) *Errina aspera* (Linnaeus, 1767) *Savalia savaglia* Nardo, 1844* (synon.*Gerardia savaglia*)
Bryozoa
Hornera lichenoides (Linnaeus, 1758)

[1] It was proposed to replace all the Cystoseira species (5 yet included in Annexe II and 23 proposed for inclusion in 2009) by the genus Cystoseira excepted the species *Cystoseira compressa*

Mollusca
Charonia lampas (Linnaeus, 1758) (= *Ch. Rubicunda* = *Ch. Nodifera*)
Charonia tritonis variegata Lamarck, 1816 (= *Ch. Seguenziae*)
Dendropoma petraeum (Monterosato, 1884)
Erosaria spurca (Linnaeus, 1758)
Gibbula nivosa A. Adams, 1851
Lithophaga lithophaga (Linnaeus, 1758)
Luria lurida (Linnaeus, 1758) (= *Cypraea lurida*)
Mitra zonata Marryat, 1818
Patella ferruginea (Gmelin, 1791)
Patella nigra (Da Costa, 1771)
Pholas dactylus (Linnaeus, 1758)
Pinna nobilis (Linnaeus, 1758)
Pinna rudis (= *P. pernula*) (Linnaeus, 1758)
Ranella olearia (Linnaeus, 1758)
Schilderia achatidea (Gray in G.B. Sowerby II, 1837)
Tonna galea (Linnaeus, 1758)
Zonaria pyrum (Gmelin, 1791)
Crustacea
Ocypode cursor (Linnaeus, 1758)
Pachylasma giganteum (Philippi, 1836)
Echinodermata
Asterina pancerii (Gasco, 1870)
Centrostephanus longispinus (Philippi, 1845)
Ophidiaster ophidianus (Lamarck, 1816)

Pisces
Acipenser naccarii (Bonaparte, 1836)
Acipenser sturio (Linnaeus, 1758)
Aphanius fasciatus (Valenciennes, 1821)
Aphanius iberus (Valenciennes, 1846)
[Carcharias taurus (Rafinesque, 1810)#]
Carcharodon carcharias (Linnaeus, 1758)
Cetorhinus maximus (Gunnerus, 1765)
[Dipturus batis (Linnaeus, 1758)#]
[Gymnura altavela (Linnaeus, 1758)#]
Hippocampus guttulatus (Cuvier, 1829)* (synon. *Hippocampus ramulosus*)
Hippocampus hippocampus (Linnaeus, 1758)
Huso huso (Linnaeus, 1758)
[Isurus oxyrinchus (Rafinesque, 1810)#]
[Lamna nasus (Bonnaterre, 1788)#]
Lethenteron zanandreai (Vladykov, 1955)
[Leucoraja circularis (Couch, 1838)#]
[*Leucoraja melitensis* (Clark, 1926)#]
Mobula mobular (Bonnaterre, 1788)
[Odontaspis ferox (Risso, 1810)#]
[Oxynotus centrina (Linnaeus, 1758)#]
Pomatoschistus canestrini (Ninni, 1883)
Pomatoschistus tortonesei (Miller, 1969)
[Pristis pectinata (Latham, 1794)#]
[Pristis pristis (Linnaeus, 1758)#]
[Rostroraja alba (Lacépède, 1803)#]
[Sphyrna lewini (Griffith & Smith, 1834)#]
[Sphyrna mokarran (Rüppell, 1837)#]
[Sphyrna zygaena (Linnaeus, 1758)#]
[Squatina aculeata (Dumeril, in Cuvier, 1817)#]
[Squatina oculata (Bonaparte, 1840)#]
[Squatina squatina (Linnaeus, 1758)#],
Valencia hispanica (Valenciennes, 1846)
Valencia letourneuxi (Sauvage, 1880)
Reptiles
Caretta caretta (Linnaeus, 1758)
Chelonia mydas (Linnaeus, 1758)
Dermochelys coriacea (Vandelli, 1761)
Eretmochelys imbricata (Linnaeus, 1766)
Lepidochelys kempii (Garman, 1880)
Trionyx triunguis (Forskål, 1775)

Aves
Calonectris diomedea (Scopoli, 1769)
Ceryle rudis (Linnaeus, 1758)#
Charadrius alexandrinus (Linnaeus, 1758)#
Charadrius leschenaultii columbinus (Lesson, 1826)#
Falco eleonorae (Géné, 1834)
Halcyon smyrnensis (Linnaeus, 1758)#
Hydrobates pelagicus (Linnaeus, 1758)
Larus armenicus (Buturlin, 1934)#
Larus audouinii (Payraudeau, 1826)
Larus genei (Breme, 1839)#
Larus melanocephalus (Temminck, 1820)#
Numenius tenuirostris (Viellot, 1817)
Pandion haliaetus (Linnaeus, 1758)
*Pelecanus crispus (*Bruch, 1832)
Pelecanus onocrotalus (Linnaeus, 1758)
Phalacrocorax aristotelis (Linnaeus, 1761)
Phalacrocorax pygmeus (Pallas, 1773)
Phoenicopterus ruber (Linnaeus, 1758)
[2]*Puffinus mauretanicus* (Lowe, PR, 1921)*
Puffinus yelkouan (Brünnich, 1764)*
Sterna albifrons (Pallas, 1764)
Sterna bengalensis (Lesson, 1831)
Sterna caspia (Pallas, 1770)#
Sterna nilotica (Gmelin, JF, 1789)#
Sterna sandvicensis (Latham, 1878)

[2] *Puffinus yelkouan* at the time of its inscription on Annex II, two sub-species were included: *Puffinus mauretanicus* et *Puffinus yelkouan* which today are considered as two different species

Mammalia
Balaenoptera acutorostrata (Lacépède, 1804)
Balaenoptera borealis (Lesson, 1828)
Balaenoptera physalus (Linnaeus, 1758)
Delphinus delphis (Linnaeus, 1758)
Eubalaena glacialis (Müller, 1776)
Globicephala melas (Trail, 1809)
Grampus griseus (Cuvier G., 1812)
Kogia simus (Owen, 1866)
Megaptera novaeangliae (Borowski, 1781)
Mesoplodon densirostris (de Blainville, 1817)
Monachus monachus (Hermann, 1779)
Orcinus orca (Linnaeus, 1758)
Phocoena phocoena (Linnaeus, 1758)
Physeter macrocephalus (Linnaeus, 1758)
Pseudorca crassidens (Owen, 1846)
Stenella coeruleoalba (Meyen, 1833)
Steno bredanensis (Cuvier in Lesson, 1828)
Tursiops truncatus (Montagu, 1821)
Ziphius cavirostris (Cuvier G., 1832)

List of species whose exploitation is regulated – Annex III. * Amendments made according to taxonomic changes; # Species included in the Annex in 2009; [ ] : For the species put in square brackets the meeting of the national Focal Points for SPAs agreed that the Parties could if they wished consult with their national experts with a view to expressing their position on the proposed amendments, either to RAC/SPA or at the forthcoming meeting of the MAP Focal Points (Athens, 7-10 July 2009). The final decision for inclusion or not of these species will be decided during the 16th meeting of the Contracting Parties.

Porifera
Hippospongia communis (Lamarck, 1813)
Spongia (*Spongia*) *lamella* (Schulze, 1872)* (synon. *Spongia agaricina*)
Spongia (*Spongia*) *officinalis adriatica* (Schmidt, 1862)*
Spongia (*Spongia*) *officinalis officinalis* (Linnaeus, 1759)*
Spongia (*Spongia*) *zimocca* (Schmidt, 1862)
Cnidaria
Antipathes sp. plur.
Corallium rubrum (Linnaeus, 1758)

Crustacea
Homarus gammarus (Linnaeus, 1758)
Maja squinado (Herbst, 1788)
Palinurus elephas (Fabricius, 1787)
Scyllarides latus (Latreille, 1803)
Scyllarus arctus (Linnaeus, 1758)
Scyllarus pygmaeus (Bate, 1888)
Echinodermata
Paracentrotus lividus (Lamarck, 1816)
Pisces
[Alopias vulpinus (Bonnaterre, 1788)#]
Alosa alosa (Linnaeus, 1758)
Alosa fallax (Lacépède, 1803)
Anguilla anguilla (Linnaeus, 1758)
[Carcharhinus plumbeus (Nardo, 1827)#]
[Centrophorus granulosus (Bloch & Schneider, 1801)#]
Epinephelus marginatus (Lowe, 1834)
[Galeorhinus galeus (Linnaeus, 1758)#]
[Heptranchias perlo (Bonnaterre, 1788)#]
Lampetra fluviatilis (Linnaeus, 1758)
[Mustelus asterias (Cloquet, 1821)#]
[Mustelus mustelus (Linnaeus, 1758)#]
[Mustelus punctulatus (Risso, 1826)#]
Petromyzon marinus Linnaeus, 1758
Prionace glauca (Linnaeus, 1758)
[Raja undulata (Lacepède, 1802)#]
[Rhinobatos cemiculus E. Geoffroy (Saint-Hilaire, 1817)#]
[Rhinobatos rhinobatos (Linnaeus, 1758)#]
Sciaena umbra (Linnaeus, 1758)
[Squalus acanthias (Linnaeus, 1758)#]
Thunnus thynnus (Linnaeus, 1758)
Umbrina cirrosa (Linnaeus, 1758)
Xiphias gladius (Linnaeus, 1758)

Annex V - Draft Mandate of the Specially Protected Areas Regional Activity Centre (SPA/RAC)

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Background

The Specially Protected Areas Regional Activity Centre (SPA/RAC) was established in Tunis in 1985 by decision of the Contracting Parties (UNEP/IG.23/11), which entrusted it with responsibility for assessing the situation of natural and scenic heritage and assisting countries to implement the 1982 Geneva Protocol concerning Specially Protected Areas in the Mediterranean. In 1993, the Contracting Parties indicated their determination to make the Mediterranean a pilot region for application of the Convention on Biological Diversity through the amendment of the Barcelona Convention and the adoption of the 1995 Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (the "SPA/BD Protocol"), which came into force in 1999, replacing the Geneva Protocol.

Objective and mission

Within the context of the implementation of the Barcelona Convention, including the related strategies, programmes and decisions, such as MAP Phase II and the MCSD, the specific objective of SPA/RAC is to contribute to the implementation of the SPA/BD Protocol.

In this respect, SPA/RAC's mission is to provide assistance to Mediterranean countries in the implementation of their commitments under the Barcelona Convention and its Protocols, with particular reference to the SPA/BD Protocol, especially with a view to: developing and promoting Specially Protected Areas (SPAs) in the Mediterranean; and reducing the loss of marine and coastal biodiversity.

Scope of action and key issues

Biodiversity issues are becoming increasingly complex, which means that whereas SPA/RAC's focus was initially limited to the main species and sites, it has now widened to cover habitats, sustainable ecosystem management and taking account of the ecosystem approach.

With a view to furthering the implementation of the SPA/BD Protocol, SPA/RAC developed a Strategic Action Programme for the Conservation of Biological Biodiversity in the Mediterranean Region (SAP BIO), which was adopted by the Contracting Parties in 2003. The principal objective of the SAP BIO is the establishment of a logical basis for the implementation of the SPA/BD Protocol by the Contracting Parties, international and national organizations, NGOs, donors, and all other stakeholders in the protection and management of the Mediterranean natural environment, by setting out principles, measures and concrete and coordinated actions at the national, transboundary and regional levels for the conservation of the Mediterranean marine and coastal biodiversity, within the framework of the sustainable use of natural resources.

Within this context, SPA/RAC pursues the following basic objectives:

- fostering improved knowledge of marine and coastal biodiversity;
- improving the management of existing and facilitating the creation of new marine and coastal protected areas;
- enhancing the protection of endangered species and habitats;
- contributing to the reinforcement of relevant national legislation and national and international capacity-building; and
- contributing to fund-raising efforts.

SPA/RAC's main fields of action to pursue the above objectives, as identified in the SAP BIO, are as follows:

- developing research to complete the knowledge base and fill in knowledge gaps on biodiversity;
- inventorying, mapping and monitoring coastal and marine biodiversity;
- assessing and mitigating the impact of threats on biodiversity;
- conserving sensitive habitats, species and sites; and
- coordinating capacity-building and technical support.

In this regard, taking fully into account of the objectives identified by the Johannesburg World Summit on Sustainable Development (2002), within the context of the principles and approaches identified in the introductory section covering all MAP components, particular emphasis is placed by SPA/RAC in its work on the responsible fisheries principle, the "no adverse effect" principle and the "prevention better than last minute cure" principle.

Principal activities

The key elements of SPA/RAC's activities, as defined by the SPA/BD Protocol and the SAP BIO, and other long-term MAP documents, include the following:

Coordination of initiatives and activities for the implementation of the SPA/BD Protocol:

- the implementation of scientific and technical research programmes as defined by the SPA/BD Protocol (Article 20), with priority being given to scientific and technical research related to Specially Protected Areas of Mediterranean Importance (SPAMIs) and the species appearing in Annexes II and III to the SPA/BD Protocol;
- the preparation of management plans for protected areas and species;
- the preparation of cooperation programmes in order to coordinate the creation, conservation, planning and management of specially protected areas, as well as the choice, management and conservation of protected species;
- the implementation of the tasks with which SPA/RAC is entrusted by the action plans adopted within the framework of the SPA/BD Protocol; and
- the preparation of educational materials designed for various groups.

In this connection, SPA/RAC formulates recommendations for guidelines and common criteria for the selection of marine and coastal protected areas that could be included on the SPAMI List, common criteria for the inclusion of additional species in Annexes II and III to the SPA/BD Protocol, guidelines for the establishment and management of protected areas and any other technical tool relevant to the implementation of the SPA/BD Protocol. SPA/RAC creates and updates databases on specially protected areas, protected species, directories of Mediterranean specialists and organizations in various fields covered by the SPA/BD Protocol, bibliographic databases, and databases on other matters of relevance to the Protocol. SPA/RAC also prepares the reports and technical studies that may be required for the implementation of the SPA/BD Protocol.

Assistance to the Parties

SPA/RAC provides technical assistance to Contracting Parties which so request, in particular to help them:

- identify, establish and manage specially protected areas, including the preparation of management plans for their marine parts, within the context of national, subregional and regional programmes;
- prepare and implement National Action Plans for the protection of endangered species and habitats;
- strengthen their capacities to deal with issues relating to the conservation and management of Mediterranean biodiversity; and
- exchange scientific and technical information concerning current and planned national research and monitoring programmes and the results thereof.

Capacity building

SPA/RAC draws up and implements training programmes, particularly regarding: public environmental education; the training of scientific, technical and managerial personnel; scientific research; the acquisition, utilization, design and development of appropriate equipment; and the transfer of technology on advantageous terms to be agreed among the Parties concerned, through training sessions, courses, study tours, on-the-job training and field missions.

Cooperation with national, regional and international organizations

SPA/RAC is the lead MAP centre for cooperation with the regional and international governmental and non-governmental organizations concerned with the protection of areas and species, in accordance with the specificity of each organization and the need to avoid the duplication of activities. It will also continue to collaborate with the other MAP components and with all relevant partners in the region to ensure synergy and complementarity in relation to action concerning specially protected areas and biodiversity.

In this regard, particular emphasis will be placed on giving effect to specific provisions of the SPA/BD Protocol respecting:

- *Relations with national authorities*, which are provided for by the SPA/BD Protocol through: the appointment of National Focal Points for SPAs, who are the representatives of the Contracting Parties and the point of contact for SPA/RAC (Article 24); the regular organization of meetings which enable the various stakeholders to meet on at least a two-yearly basis (Article 25(b)); and the drafting of regular reports which provide information regarding the implementation of the SPA/BD Protocol (Article 23); and

- *Relations with other partners (UN bodies, international and regional conventions and agreements, IGOs, NGOs and the private sector)* (Article 25(g)), which may attend the meetings of the National Focal Points as observers. Some partners are also identified in the Action Plans for the conservation of threatened species and habitats adopted within the MAP framework as being "Partners" or "Associates" to these Action Plans. Finally, where appropriate, memoranda of cooperation may be drawn up between SPA/RAC and its partners to promote the implementation of activities under the SPA/BD Protocol.

Improving the visibility of MAP

SPA/RAC represents MAP at national, regional and international meetings and fora related to the fields covered by the SPA/BD Protocol and strives to publicize MAP's programmes and activities at the various meetings. SPA/RAC supports several activities aimed at promoting visibility and raising awareness of MAP action to protect the environment and promote sustainable development in the region. SPA/RAC organizes special events, such as United Nations Day, World Biodiversity Day and World Environment Day, with the aim of promoting the visibility of MAP and increasing awareness of the related issues in the media and among the general public, in collaboration with other MAP components. In this respect, efforts will be made to identify synergies among all MAP components to increase the visibility of the Barcelona Convention in line with the MSSD Information and Communication Strategy.

Sources and mechanisms of financing

The principal recurrent funding for SPA/RAC activities and staffing is provided through the Mediterranean Trust Fund (MTF). Additional funding is sought for actions that are clearly defined in space and time, either in response to international calls for proposals or through spontaneous proposals from sponsors, including volunteer countries, international institutions, donor agencies and the private sector.

Annex VI - Proposal regarding a regional working programme for the Coastal and Marine Protected Areas in the Mediterranean Sea

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FOREWORD

The Parties to the CBD agreed in 2004 to take action to address the under representation of marine ecosystems in the global network of protected areas. In this context, they adopted the 2012 target for MPAs that invites countries to achieve by 2012 a global network of comprehensive, representative and effectively managed national and regional protected area system.

During their 14th ordinary meeting (Portoroz, Slovenia, November 2005) the Contracting Parties to the Barcelona Convention invited the Regional Activity Centre for Specially Protected Areas (RAC/SPA) to elaborate a programme of work for the development of marine protected areas (MPAs) aimed at supporting the Mediterranean countries to achieve the CBD's 2012 target by establishing a representative network of MPAs in the Mediterranean Sea.

The draft programme of work presented hereinafter was elaborated by RAC/SPA in consultation with the IUCN Centre for Mediterranean Cooperation, WWF-MedPo, MedPAN and ACCOBAMS. It takes into account the information on MPAs available in the databases and documentation of these organisations. The 9th Meeting of the NFP for SPA (Malta, 3-6 June 2009) reviewed the draft programme and decided to submit it for adoption to the Contracting Parties.

After the adoption of this programme of work, the onus will be on the national authorities of the Contracting Parties to implement it. The partner organisations that participated in its elaboration will provide the Mediterranean countries, upon their request, with the technical and, where possible, financial assistance to undertake the activities of the programme of work.

The first step in the implementation of the programme of work will be an Assessment of the representativity and effectiveness of the existing Mediterranean network of marine and coastal Protected Areas.

SECTION 1: DESIGNING ECOLOGICAL NETWORKS OF MPAS IN THE MEDITERRANEAN SEA

EXECUTIVE SUMMARY

With this document we identify sets of criteria to aid in the creation of representative networks of marine protected areas (MPAs) in the Mediterranean Sea. Such action is needed to enable the RAC/SPA to comply with the request made in 2005 by the Contracting Parties to the Barcelona Convention, to develop a programme of work for the development of marine protected areas (MPAs) aimed at supporting the region's nations to implement by 2012 a representative network of MPAs in the Mediterranean Sea.

We recommend adopting a three-step hierarchical planning approach, which begins at the large scale and focuses in on ever-smaller scales. 1. At the widest scale, in this case that of the Mediterranean Basin, the baseline for designing an ecological network will involve the identification of large scale ecological units. The purpose of this is to recognize ecological distinctions between different parts of the Sea, and ensure that something that is called a "Mediterranean Network of MPAs" is truly comprehensive and representative of all of its sub-regions. 2. At the next scale, priority conservation areas should be identified within each ecological unit. These areas would not constitute MPAs themselves, but would be focal areas for individual MPA networks. 3. Once such priority conservation areas are identified, the task of identifying sites to develop true ecological networks can be initiated. Individual MPAs within these networks should protect what is ecologically most important – i.e., they should focus on habitats where a concentration of ecological processes results in a high diversity of species. To become a network, it will be important not only to establish MPAs to protect these key areas, but also to maintain the ecological linkages between these areas.

To address the selection of priority areas, we require a review of existing classifications, defining the nesting strategy considering from the finest classification scale to the regional scale. We describe steps related to production of maps; the set of variables with adequate set of data and environmental drivers; using as a principle data if these are available and if not use proxies; defining synergies and overlaps with any existing sub-regional classifications. We also intend to provide a brief overview of the general principles for the two realms (pelagic/benthic) and the different classification systems, making explicit which criteria were used by the benthic group to separate the two bathyal zones: the upper and lower bathyal; and make explicit the role of biological data leading to the results.

Concerning the identification of *priority conservation areas* within each ecological units seven criteria which have been previously proposed could be used in the

Mediterranean: uniqueness or rarity; special importance for life history stages of species; importance for threatened, endangered or declining species and/or habitats; vulnerability, fragility, sensitivity or slow recovery; biological productivity; biological diversity; and naturalness.

Once the Mediterranean priority conservation areas have been identified within each ecological unit, qualitative and/or quantitative techniques can be iteratively used to identify sites where MPAs should be established to constitute the network (third step). Area selection should proceed through two phases: first, selection should reflect the areas' recognised ecological importance, vulnerability, and address the requirements of ecological coherence through: representativity; connectivity; and replication. Second, the adequacy and viability of the selected sites should be assessed by considering their size, shape, boundaries, buffering, and appropriateness of the site management regime.

INTRODUCTION

1. Context

During their 14th ordinary meeting in Portoroz, Slovenia, in November 2005 the Contracting Parties to the Barcelona Convention requested the Regional Activity Centre for Specially Protected Areas (RAC/SPA) to develop a programme of work for the development of marine protected areas (MPAs) aimed at supporting the region's nations to implement by 2012 a representative network of MPAs in the Mediterranean Sea.

Complying with the request from the Barcelona Convention Parties will involve the implementation of a number of different actions, including a greater integration of SAP BIO in the RAC/SPA actions, in particular concerning the creation of networks of MPAs, the strengthening of existing MPAs and the establishment of new MPAs.

Within this framework, we have been requested by the RAC/SPA to support its efforts by identifying criteria for the establishment of a representative network of MPAs in the Mediterranean, as well as proposing guidelines of a medium-term (5 years) programme of work designed to facilitate the creation of new MPAs to integrate the networks.

There is growing consensus in the marine conservation community that strategically designed MPA networks confer huge advantages over single MPAs. Networks can potentially provide maximal conservation benefit by providing the strictest possible protections for the most ecologically important areas, the most environmentally sensitive habitats, and/or the most vulnerable species. Heightened protections may be more feasible through MPA networks than through individual MPAs because while the total target area spanning a network may be large, the actual amount of restricted access or use over that large area is relatively small.

Networks have other benefits as well. They collectively constitute a spatial management tool that can be used to conserve highly migratory or mobile species, wherein key habitats for various life stages of a target organism are preserved. Alternatively, networks can be used to ensure that all representative habitat types within a country's jurisdiction or within a region are conserved. Networks can provide economies of scale for training personnel and provide a mechanism for linking individuals and institutions, facilitate cross-project learning, and allow more integrated research and sharing of scientific data.

This much is clear. It is also clear that the parties to the Barcelona Convention and its Protocol on Specially Protected Areas and Biological Diversity have made serious commitments to establish representative networks of MPAs throughout the Mediterranean. But how could such networks be constructed, and are there universal lessons that can guide MPA network development in the Mediterranean?

It is important to note that the design of any MPA within an ecological network must be developed with socio-economic and socio-political feasibility in mind. In other words, although a scientific spatial planning process may be used to identify potential sites within an ecological network of MPAs, science alone cannot drive decisions on what kind of MPA is instituted, how large it is, or how it will be managed. These decisions must be made with the individual circumstances of a place in mind, and preferably through a participatory process. Although this report only focuses on the ecological aspects of establishing a regional network of MPAs, it is today common wisdom that the success of MPAs can only derive from addressing a balanced combination between ecological and socio-economic concerns.

2. Ecological MPA networks

It is useful, in fact necessary, to distinguish various kinds of MPA networks. Creating a system of MPAs by pulling together all existing MPAs in a region and calling it a network is often done, but this does not constitute a true network. Rather it is a conglomeration of MPAs, many opportunistically designated, often with many different objectives. In order for MPA networks to make ecological sense, they must be systematically planned with the same goal in mind. One can imagine a network of MPAs being the subject of a single spatial management plan with the individual MPAs within the network acting as the focal points for conservation.

Just as geographic proximity of already existing MPAs is not a good criterion for determining whether an ecological network is being built, so neither does putting all existing MPAs into a single legal or institutional framework. In the Mediterranean, SPAMI (Specially Protected Areas of Mediterranean Importance) sites are proposed by contracting parties to the Barcelona Convention. While these sites are extremely important to raising awareness and generating political will, the SPAMI list in and of itself does not constitute an ecological network.

This is not to say that linking MPAs, or MPA managers, within a region does not confer conservation benefits. Such “networking” is extremely important, and MedPAN as a network of practitioners shows the value of learning from one another. But true ecological networks of MPAs require a systematic and strategic planning effort to identify what areas are ecologically most important and protect them through MPA establishment.

MPA NETWORK DESIGN

Planning often occurs at larger scales than management or conservation interventions, and the end result can be that management on the ground is more *ad hoc* than the “management dreams” of regional planners. For this reason, a three-

step hierarchical planning approach is recommended, which begins at the large scale and focuses in on ever-smaller scales.

1. At the largest scale, in this case that of the Mediterranean Basin, the first recommended step in designing an ecological network is the **identification of large scale ecological units**. The purpose of this is to recognize ecological distinctions between different parts of the Sea, and ensure that something that is called a "Mediterranean Network of MPAs" is truly comprehensive and representative of all of its sub-regions.
2. At the next scale, **priority conservation areas** should be identified within each unit. These areas would not constitute MPAs themselves, but would be focal areas for individual MPA networks. Such areas may exhibit high biodiversity or have marine species of conservation concern (vulnerable, rare, or highly valued marine species), or they may have a unique or unusual combination of marine habitats (exhibiting high Beta diversity).
3. Once such priority conservation areas are identified, the task of identifying **sites to develop true ecological networks** can be initiated. Individual MPAs within these networks should protect what is ecologically most important – i.e., they should focus on habitats where a concentration of ecological processes results in a high diversity of species. Such areas might include spawning grounds for fishes, highly productive areas such as upwelling areas, estuaries, or *Posidonia* beds, aggregating areas such as seamounts, and the like. To become a network, it will be important not only to establish MPAs to protect these key areas, but also to maintain the ecological linkages between these areas. These linkages are made possible by the flow of water through currents and by the movement of organisms through larval dispersion of propagules or movement of adults or juveniles.

We feel there has been some mixing of criteria that are being used for different purposes in most of these methodologies, and propose a division of site-selection criteria and protected area design criteria. Site-selection criteria are meant to highlight areas, due to their biological/ecological value, their potential in filling gaps of representativity, and the degree to which they are threatened and thus need protection (Step 2 above). Design criteria then can direct planners to developing the most efficacious protected area for the site (Step 3 above).

3. Subdivision of the Mediterranean into ecological units

Identifying the subdivision of the Mediterranean into marine ecological units is necessary to the designing of a balanced network of MPAs. Bio-regionalisation at the sub-regional level to create key base data layers is an important step towards the identification and selection of components of representative networks of MPAs, to provide greater understanding of biological patterns and processes at the regional level. Existing global and regional or sub-regional marine regionalization efforts include those by Ekman (1953), Hedgpeth (1957), Briggs (1974), Hayden *et al.*

(1984), Sherman and Alexander (1989), Kelleher *et al.* (1995), Longhurst (1998), Bailey (1998), Dinter (2001), Spalding *et al.* (2007), and Ivanov and Spiridonov 2007.

"Ecoregion is a large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions. The boundaries of an ecoregion encompass an area within which important ecological and evolutionary processes most strongly interact" (WWF 2003). Ecoregion conservation "is an evolution in thinking, planning, and acting at the spatial and temporal scales best suited for successful biodiversity conservation" (WWF 2003).

A subdivision of the Mediterranean into seven distinct ecoregions was tentatively proposed by Spalding *et al*. (2007; see UNEP/CBD/COP/8/INF/34). For the Mediterranean region the subdivision of the Mediterranean Sea in the following four areas was agreed within the framework of the elaboration of the concept of Ecosystem Approach : 1. Western Mediterranean; 2. Adriatic Sea; 3. Ionian Sea – Central Mediterranean; 4. Aegean Sea – Levantine Sea (UNEP(DEPI)/MED WG 326/3).
Building upon the results of a workshop organised in Mexico City in Jan. 2007 (UNEP 2008), it may be advisable to approach benthic and pelagic systems separately.

In the pelagic realm to consider the use of fuzzy boundaries for each province; consider the description of transition zones, boundary currents, upwelling systems as main features; and recognize the importance of hotspots and migratory species.

In the benthic realm to start with a habitat/functional classification system and then overlay available species composition and distribution patterns, and consider the connectivity between the benthic and pelagic realms in a second step.

Further work is needed to align and nest such subdivision process based on agreed principles. We recommend that methodologies and tools used are examined to review the existing classification; define the nesting strategy considering from the finest classification scale to the regional scale; describe steps related to produce the maps; provide a set of variables with adequate set of data and environmental drivers, use as a principle data if these are available and if not use proxies; define synergies and overlaps with any existing sub-regional classifications; provide a brief overview of the general principles for the two realms (pelagic/benthic) and the different classification systems; make explicit which criteria were used by the benthic group to separate the two bathyal zones: the upper and lower bathyal; and make explicit the role of biological data leading to the results.

4. Identification of priority conservation areas within ecological units

Once distinct ecological units are identified in the Mediterranean and agreed upon, the process of identifying priority conservation areas within each ecoregion can

begin. Areas relevant because of biodiversity richness or the presence of protected species may qualify as priority conservation areas if they meet special criteria.

A number of efforts have recently been devoted to identify, list and describe such criteria. We here refer mostly to the most recent attempt (Convention on Biological Diversity 2007), resulting from a workshop organised in the Azores in 2007, in which the following seven criteria for identifying ecologically or biologically significant marine areas in need of protection, in open ocean waters and deep sea habitats, are recognised:
Uniqueness or rarity;
Special importance for life history stages of species;
Importance for threatened, endangered or declining species and/or habitats;
Vulnerability, fragility, sensitivity or slow recovery;
Biological productivity;
Biological diversity;
Naturalness.

These criteria are further analysed in Table 1, adapted to the Mediterranean from CBD (2007).

5. Criteria for site selection

There are several guidelines available in the literature and among the materials put out by various organisations that can steer the site selection process that is the formative planning step in constructing truly effective, ecologically coherent, and comprehensive MPA networks.
Thus only certain criteria help elucidate the choice of new sites to form a representative network. These criteria include: representativeness, resilience, shape and size of individual MPAs, connectivity, viability, permanence, replication and degree to which precautionary principles were invoked in designing individual MPAs. Of these, representativeness, viability (or some combination of viability and resilience, which are very similar concepts), connectivity, and replication seem to be the most important considerations in selecting sites for ecologically coherent networks. Achieving representativeness and replication are relatively straightforward, but being able to do so will mean compiling existing information on habitat type and distribution within the study or planning area. Measuring resilience or viability and determining connectedness or connectivity is somewhat more difficult, and we feel that percentage no-take areas are not a good metric to use in this regard.
OSPAR has reformulated the IUCN/WCPA checklist to meet its needs in Northern Europe (OSPAR, 2007). This checklist may be applied at different scales; e.g., employing local, regional, national, or international study areas. It is recommended, however, that the scale of the assessment be made clear at the outset, and that one scale be applied throughout any given assessment.

Table 1 – Criteria for the selection of priority conservation areas in the Mediterranean (adapted from CBD 2007)

Criteria	Definition	Rationale	Mediterranean examples	Consideration in application
Uniqueness or Rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features	Irreplaceable Loss would mean the probable permanent disappearance of diversity or a feature, or reduction of the diversity at any level.	Posidonia meadows Vermetid reefs	Risk of biased-view of the perceived uniqueness depending on the information availability Scale dependency of features such that unique features at one scale may be typical at another, thus a global and regional perspective must be taken
Special importance for life history stages of species	Areas that are required for a population to survive and thrive.	Various biotic and abiotic conditions coupled with species-specific physiological constraints and preferences tend to make some parts of marine regions more suitable to particular life-stages and functions than other parts.	Area containing (i) breeding grounds, spawning areas, nursery areas, juvenile habitat or other areas important for life history stages of species; or (ii) habitats of migratory species (feeding, wintering or resting areas, breeding, moulting, migratory routes).	Connectivity between life-history stages and linkages between areas: trophic interactions, physical transport, physical oceanography, life history of species Sources for information include: e.g. remote sensing, satellite tracking, historical catch and by-catch data, Vessel monitoring system (VMS) data. Spatial and temporal distribution and/or aggregation of the species
Importance for threatened, endangered or	Area containing habitat for the survival and recovery of endangered,	To ensure the restoration and recovery of such species and habitats.	Areas critical for threatened, endangered or declining species and/or habitats, containing (i) breeding grounds, spawning	Includes species with very large geographic ranges. In many cases recovery will require

declining species and/or habitats	threatened, declining species or area with significant assemblages of such species.		areas, nursery areas, juvenile habitat or other areas important for life history stages of species; or (ii) habitats of migratory species (feeding, wintering or resting areas, breeding, moulting, migratory routes).	reestablishment of the species in areas of its historic range. Sources for information include: e.g. remote sensing, satellite tracking, historical catch and by-catch data, vessel monitoring system (VMS) data
Vulnerability, Fragility, Sensitivity, or Slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.	The criteria indicate the degree of risk that will be incurred if human activities or natural events in the area or component cannot be managed effectively, or are pursued at an unsustainable rate.	Vulnerability of species Inferred from the history of how species or populations in other similar areas responded to perturbations. Species of low fecundity, slow growth, long time to sexual maturity, longevity (e.g. sharks, etc). Species with structures providing biogenic habitats, such as deepwater corals, sponges and bryozoans; deep-water species. Vulnerability of habitats Areas susceptible to ship-based pollution. Ocean acidification can make deep sea habitats more vulnerable to others, and increase susceptibility to human induced changes.	Interactions between vulnerability to human impacts and natural events Existing definition emphasizes site specific ideas and requires consideration for highly mobile species Criteria can be used both in its own right and in conjunction with other criteria.

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	Important role in fuelling ecosystems and increasing the growth rates of organisms and their capacity for reproduction	Ligurian Sea permanent front Known Mediterranean upwelling areas Cold seeps Eratosthenes Seamounts	Can be measured as the rate of growth of marine organisms and their populations, either through the fixation of inorganic carbon by photosynthesis, chemosynthesis, or through the ingestion of prey, dissolved organic matter or particulate organic matter Can be inferred from remote-sensed products, e.g., ocean colour or process-based models Time series fisheries data can be used, but caution is required
Biological Diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	Important for evolution and maintaining the resilience of marine species and ecosystems	Sea-mounts and canyons Fronts and convergence zones Cold coral communities (e.g. off Santa Maria di Leuca, Ionian Sea) Deep-water sponge communities	Diversity needs to be seen in relation to the surrounding environment Diversity indices are indifferent to species substitutions Diversity indices are indifferent to which species may be contributing to the value of the index, and hence would not pick up areas important to species of special concern, such as endangered species Can be inferred from habitat heterogeneity or diversity as a surrogate for species diversity in areas where biodiversity has not been sampled intensively.

Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	To protect areas with near natural structure, processes and functions To maintain these areas as reference sites To safeguard and enhance ecosystem resilience	Corsican-Ligurian-Provencal basin Alborán Sea Most ecosystems and habitats have examples with varying levels of naturalness, and the intent is that the more natural examples should be selected.	Priority should be given to areas having a low level of disturbance relative to their surroundings In areas where no natural areas remain, areas that have successfully recovered, including reestablishment of species, should be considered. Criteria can be used both in its own right and in conjunction with other criteria.

This checklist is called a “self-assessment” because it is expected that those directly involved in the design and management of a given network would best be able to judge the relative ratings for many of these questions. Nonetheless, it can be expected that different assessors will have different internalized standards by which they rate their networks, and thus two different assessors would likely produce somewhat different scores for the same network. In this light, making comparisons of scores between networks that have used different assessors should be applied with caution.

The checklist has been ordered according to the OSPAR requirement to assess ecological coherence, with the most applicable criteria in Table I, secondary criteria in Table II, and tertiary criteria in Table III. Table IV puts forward criteria that while not applicable to the assessment of ecological coherence, are recognized to be of importance to the long-term success of an MPA network (see Appendix 1). In looking to other parts of the world where ecological MPA networks have been designed or are being considered, (e.g. California, Canada, Great Barrier Reef, South Australia, New Zealand), it is apparent that scale of planning will greatly influence choice of criteria. In an area as large as the federal waters of Canada, one would have to work down through a hierarchy of scales to get to a scale (probably on the level of a National Marine Conservation Area) where one could then design one or more ecologically coherent MPA networks. Similarly in the Mediterranean, a representative system would be one in which representation and replication occur at the scale of habitats within ecoregions, but where connectivity and viability requirements are met at much finer scales. Scaling is thus important – and it needs to be said that not all criteria will be relevant to all scales.

Belgium may have the most useful template to guide MPA network design and site selection, though the criteria used in the country’s “biological valuation” project were not designed with the intent of creating MPA networks. Derous *et al.* (2006) describe first order and second order criteria for ranking the relative value of marine sites: rarity, aggregation, fitness consequences (main criteria), naturalness and proportional importance (modifying criteria). We think a combination of criteria from WCPA and Derous *et al*. (2006), applied at appropriate scales, will create a robust set of representative MPA networks for the Mediterranean region.

There is currently some controversy regarding whether distance between boundaries of individual MPAs provides a good measure of the strength of linkage between MPAs. Distance is a crude proxy for determining ecological linkage, since some very close MPAs may have little to no physical or biotic linkages between them, while other very distant MPAs may be closely linked by the movement of, and use of space by, highly mobile species. For this reason, it may be better to answer the question about how well linkages are preserved by looking to see if there is any existing or prospective activity between (i.e. outside of) MPAs that could interrupt the flow of nutrients, the communications among organisms, or the movement of organisms themselves between one MPA and another in the network. If so, then management will have to be directed at such potentially disruptive activities to ensure the network operates as an effective ecological network.

At the 2007 Azores workshop (CBD 2007; Table 2), the following consolidated set of scientific criteria for representative networks of marine protected areas, including in open ocean waters and deep-sea habitats, was identified:
Ecologically and biologically significant areas;
Representativity;
Connectivity;
Replicated ecological features;
Adequate and viable sites.

1. ***Table 2. Scientific criteria to select areas to establish a representative network of MPAs (from CBD 2007)***

Required network criteria	Definition	Applicable site-specific considerations (inter alia)
Ecologically and biologically significant areas	Ecologically and biologically significant areas are geographically or oceanographically discrete areas that provide important services to one or more species/populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics, or otherwise meet the criteria as identified in Table 1.	Uniqueness or rarity Special importance for life history stages of species Importance for threatened, endangered or declining species and/or habitats Vulnerability/ fragility/ sensitivity/ slow recovery Biological productivity Biological diversity Naturalness
Representativity	Representativity is captured in a network when it consists of areas representing the different biogeographical subdivisions of the global oceans and regional seas that reasonably reflect the full range of ecosystems, including the biotic and habitat diversity of those marine ecosystems.	A full range of examples across a biogeographic habitat or community classification*;* relative health of species and communities; relative intactness of habitat(s); naturalness
Connectivity	Connectivity in the design of a network allows for linkages whereby protected sites benefit from larval and/or species exchanges, and functional linkages from other network sites. In a connected network, individual	Currents; gyres; physical bottlenecks; migration routes; species dispersal; detritus; functional linkages. Naturally unconnected sites may also be included (e.g., isolated seamount communities)

	sites benefit one another.	
Replicated ecological features	Replication of ecological features means that more than one site shall contain examples of a given feature in the given biogeographic area. The term *features* means "species, habitats and ecological processes" that naturally occur in the given biogeographic area.	Accounting for uncertainty, natural variation and the possibility of catastrophic events. Features that exhibit less natural variation or are precisely defined may require less replication than features which are inherently highly variable or are only very generally defined.
Adequate & Viable sites	Adequate & viable sites indicate that all sites within a network should have size and protection sufficient to ensure the ecological viability and integrity of the feature(s) for which they were selected.	Size; shape; buffers; persistence of features; threats; surrounding environment (context); physical constraints; scale of features/processes; spillover/compactness;

As a way of proceeding, we suggest that first qualitative and/or quantitative techniques be iteratively used to identify sites to include in a network. Their selection for consideration of enhanced management should reflect their recognised ecological importance, vulnerability, and address the requirements of ecological coherence through:
Representativity;
Connectivity;
Replication.

Secondly, the adequacy and viability of the selected sites should be assessed. Consideration should be given to their size, shape, boundaries, buffering, and appropriateness of the site management regime. Design criteria can direct planners to developing the most efficacious protected area for the site. Such design criteria would address questions of size, shape, management regime, including whether the MPA should be a no-take or multiple use area.

We feel that such design criteria, captured in other methodologies under headings such as "adequacy" and "management effectiveness", should come in a second phase of the project, once key sites for Mediterranean MPA networks have been determined.

MANAGEMENT CONSIDERATIONS

Perhaps the best known is the IUCN/WCPA checklist for MPA networks (Day and Laffoley, 2007), which allows assessment of the relative "value" of sites to a network once

that network has been designed. Many of the criteria evaluate how well each individual MPA might perform in meeting its own objectives – a checklist to assess whether best management practices are being utilized, much like Staub and Hatziolos (2004) or Corrales (2005).

CONCLUSION

One can imagine a time in the future when the marine biodiversity of the Mediterranean is truly protected through an ecological network (or networks) of MPAs. In this scenario, each of the seven or eight ecoregions of the Mediterranean would have priority conservation areas demarcated, and within these priority conservation areas, systematically designated and linked individual MPAs within ecological networks.

These networks would be built from existing MPAs by determining which areas are most ecologically critical, and establishing new MPAs in places where MPAs do not already exist. In addition, the integrity of the networks would be maintained by management measures outside MPAs that aim to preserve linkages.

The individual MPAs within any network in any ecoregions of the Mediterranean could be no-take areas, multiple use sanctuaries, biosphere reserves, nature preserves, or any number of other MPA management categories. But the cumulative effect of having these different sorts of MPAs all linked within a network would be to create a whole greater than the sum of its parts, with all MPAs working towards a common goal of biodiversity conservation.

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APPENDIX. OSPAR MPA NETWORK RAPID SELF-ASSESSMENT CHECKLIST

Ecological Coherence Criteria			
Assessment Criterion 1: Adequacy / Viability			
Size & Shape		Score	Comments
Specific consideration was given to the size and shape of the sites within the MPA network when it was designed and implemented in order to maximize the effectiveness of the network to achieve its ecological objectives.	3		
Some consideration was given to the size 23or shape of the sites within the MPA network when it was designed, and some consideration overall to achieving its ecological objectives.	2		
Some consideration was given to the size and/or shape of the sites within the MPA network when it was designed, but no consideration overall to achieving its ecological objectives.	1		
Little or no consideration was given to the size and/or shape of the sites within the MPA network; nor any consideration of the effectiveness of the network to achieve its ecological objectives.	0		
Consideration was given to edge effects of the sites within the MPA network when it was designed.	Bonus 1		
Viability		Score	Comments
The MPA network includes many self-sustaining viable no-take areas, which are all geographically dispersed within the study area ensuring viability at all levels (i.e. at the ecosystem, species and genetic levels) within natural cycles of variation	3		
The MPA network includes some no-take areas geographically dispersed within the study area, some of which are designed to be self-sustaining.	2		
The MPA network includes a few no-take areas geographically dispersed within the study area.	1		
The MPA network includes no or only a single no-take area.	0		
Assessment Criterion 2: **Representativity**		Score	Comments
The MPA network represents all or almost all (~80-100%) of the range of species and/or habitats and/or ecological processes within the study area.	3		
The MPA network represents most (~30-80%) of the range of species and/or habitats and/or ecological processes known in the study area.	2		
The MPA network represents some (~10 -30%) of the known range of species and/or habitats and/or ecological processes in the study area.	1		
The MPA network comprises only one or two types of marine species and/or habitats known in the study area (e.g. only coral reefs are protected in the network)	0		
Assessment Criterion 3: **Replication**		Score	Comments
The MPA network includes highly protected spatially-separated replicates of 80% or more of the features occurring within the study area (i.e. almost all known features within your network are replicated to spread any risk).	3		
The MPA network includes spatially-separated replicates of highly protected areas within 25 - 80% of the features occurring within the study area	2		
The MPA network includes some spatially-separated replicates of highly protected areas, but they represent less than 25% of the features occurring within the study area	1		
The MPA network does not have any spatially-separated replicates of highly protected areas within the study area.	0		
Systematic replication is occurring throughout every ecological region in the study area, e.g. cross shelf and long-shore replication	Bonus 1		

Assessment Criterion 4: **Connectivity**		Score	Comments
The MPA network has been purposefully designed to maximize all / most key ecological processes (spatial and/or temporal) in the study area	3		
The MPA network was purposefully designed and does consider some of the key ecological processes (spatial and/or temporal) in the study area	2		
The MPA network was purposefully designed and does consider a few (one or more) of the key ecological processes (spatial and/or temporal) in the study area	1		
The design of the MPA network took little or no account of any key ecological processes in the study area	0		
The MPA network has been purposefully designed to maximize and enhance most of the physical linkages between individual MPAs in the network.	Bonus 1		
Table I Total (out of a possible 18)			
Eco-Coherence Weighted Total (total given above x 3)			

Factors Influencing Eco-Coherence			
Resilience		Score	Comments
The MPA network has been specifically designed so 30% or more of the study area is free from extractive activities or habitat-altering activities, or other significant human-induced stresses.	3		
Between 10-30% or the study area is free from extractive activities, habitat-altering activities, or other significant human-induced stresses.	2		
Only a small part the study area (<10%) is free from extractive activities, habitat-altering activities, or other significant human-induced stresses.	1		
Virtually none of the study area is free from extractive activities, habitat-altering activities, or other significant human-induced stresses.	0		
The MPA network has been specifically designed to maximize the resilience of the network in the face of long-term geophysical and/or biochemical changes;	Bonus 1		
Precautionary design		Score	Comments
The MPA network is configured to take into consideration all or most of the known threats occurring within the study area.	3		
The MPA network considers several of the known threats occurring within the study area.	2		
The MPA network considers a couple of the known threats occurring within the study area.	1		
MPA network does not consider any of the known threats occurring within the study area.	0		
The MPA network has been effectively designed to cope with a lack of comprehensive data.	Bonus 1		
External spatial & temporal considerations		Score	Comments
The design of the MPA network considered a wide range of external spatial and temporal considerations including ecological processes, connectivity and other external influences; and managers continue to consider these as part of ongoing implementation.	3		
The design of the MPA network did consider some external spatial and temporal issues; and managers continue to consider each of these issues as part of ongoing implementation.	2		
The design of the MPA network did consider one or more external spatial or temporal issues; and some of these are still considered by managers in the ongoing implementation of the network.	1		
External spatial and temporal issues were not considered in the design or in the ongoing implementation of the MPA network.	0		
There is good historical baseline information (or historic data) to determine whether there are ‚shifting baselines' for a range of issues.	Bonus 1		
Table II Total (out of a possible 12)			

Eco-Coherence Weighted Total (total given above x 2)		

Factors Influencing the Assessment of Eco-Coherence			
Clearly defined objectives		Score	Comments
There is a range of clear, achievable and measurable objectives (including ecological, social and economic objectives) defined for the MPA network and derived from the legislation;	3		
There are various objectives for the MPA network which are clear, achievable and measurable; addressing at least two of the relevant aspects in the necessary range (i.e. ecological, social or economic objectives);	2		
There are some objectives for the MPA network; but only one or two can be considered as clear, achievable and measurable; AND the objectives do not address the necessary range (i.e. ecological, social and economic objectives).	1		
There are no clear objectives for the MPA network.	0		
These objectives were determined through an open, transparent and balanced process involving a wide range of stakeholders.	Bonus 1		
Scientific information		Score	Comments
All available scientific information is used to support planning and management, and it is regularly updated and used for effective decision-making.	3		
There is some scientific information to support planning and management, and whatever is available is used for decision-making.	2		
There is limited scientific information to support planning and management, and it is sometimes used for decision-making.	1		
There is little or no scientific information base to support planning and management; or, the available information is not used for decision-making.	0		
There is an ability to incorporate new scientific information into subsequent planning or for ongoing management tasks.	Bonus 1		

Social & economic information		Score	Comments
All available social and economic information is used to support planning and management, and it is regularly updated and used for effective decision-making.	3		
There is some social and economic information to support planning and management, and whatever is available is used for decision-making.	2		
There is limited social or economic information to support planning and management, and it is sometimes used for decision-making.	1		
There is little or no social or economic information base to support planning and management; or, the available information is not used for decision-making.	0		
There is an ability to incorporate new social or economic information into subsequent planning or for ongoing management tasks.	Bonus 1		
Monitoring & assessment		Score	Comments
A good monitoring and evaluation system exists, with progress against most if not all the objectives of the MPA network being monitored regularly and objectively, with the results being widely disseminated and used in adaptive management.	3		
There is an agreed and implemented monitoring program, and progress against some of the objectives of the MPA network is objectively monitored periodically, with the results publicly available and/or used in adaptive management.	2		
There is some ad hoc monitoring and progress against at least one of the objectives of the MPA network has been monitored and/or publicly reported.	1		
Progress against the objectives of the MPA network is rarely monitored AND no assessment of MPA effectiveness has ever occurred or been	0		

reported.			
Table III Total (out of a possible 15)			
Eco-Coherence Weighted Total (same as total above)			

Factors Influencing Long-Term Success			
Adaptive management		Score	Comments
The MPA network is readily able to incorporate changes such as new information becomes available (e.g. from „in-the-field' experience, or as a result of changing external circumstances).	3		
The MPA network has some ability to incorporate some changes when new information becomes available (e.g. „in-the-field' experience, or as a result of changing external circumstances).	2		
The MPA network is has a limited ability to incorporate occasional changes when new information becomes available (e.g. in the timeframe of several years).	1		
The MPA network does not have management systems or any monitoring arrangements to determine system responses and provide a basis for adaptive management; NOR is it likely able to incorporate changes were new information to become available.	0		

Economic & social considerations		Score	Comments
The design and implementation of the MPA network continues to consider the economic and socio-cultural setting, as well as the real benefits and costs of the network (including both tangible and intangible benefits and costs);	3		
The design and implementation of the MPA network initially considered the economic and socio-cultural setting, as well as the real benefits and costs of the network (and may have included tangible and intangible benefits and/or costs).	2		
Some consideration was given to the economic and socio-cultural setting, or to the benefits or costs, when the MPA network was initially designed.	1		
No consideration was given to the economic or socio-cultural setting, or to the benefits or costs, when the MPA network was initially designed, and little/no consideration occurs during implementation.	0		
The MPA network has addressed the need for structural adjustment or compensation for lost benefits from foregone economic opportunities.	Bonus 1		
Institutional & governance considerations		Score	Comments
The MPA network has well established mechanisms for the horizontal integration among all levels of government, and vertical integration among agencies with different mandates, as well as involving local communities, indigenous people and regional groups.	3		
The MPA network has some mechanisms for the horizontal integration among different levels of government, and vertical integration among agencies with different mandates, as well as involving local communities, indigenous peoples and regional groups.	2		
The MPA network has some legislative and administrative arrangements, but these do not provide both effective horizontal integration among different levels of government, and vertical integration between agencies.	1		
The MPA network has little or no mechanisms for the horizontal integration among different levels of government, nor for any vertical integration among agencies with different mandates.	0		
The MPA network has an effective legislative and administrative framework, including a „nested governance' structure operating simultaneously at multiple scales and levels (integrating local aspirations, national strategies and/or international obligations).	Bonus 1		

Sustainable financing		Score	Comments
The MPA network has a well-developed and periodically audited program of long-term funding (assessed, and if necessary, increased against a recognised financial index) in order to meet both core costs and emerging issues.	3		
The MPA network has an adequate program of long-term funding for core costs and able to seek funding for emerging issues.	2		
The MPA network has poor and spasmodic program of long-term funding to meet core costs, and is sometimes able to seek funding for emerging issues.	1		
The MPA network doest not have a well-developed or periodically audited program of long-term funding.	0		
The budget in the MPA is well managed; and all staff understand the financial situation.	Bonus 1		
Table IV Total (out of a possible 15)			
Eco-Coherence Weighted Total (zero: table not used)	0		
Grand Total of all Tables (out of a possible 60)		Percentage: Grand Total x 100 / 60 =	
Weighted Eco-Coh. Grand Total (out of a possible 93)		Percent: Grand Weighted Total x 100 / 93 =	

Location / Extent of Study Area: the area under consideration in this survey. (For example, it may include the jurisdictional waters of a CP, region within a CP's waters, or it could include a particular biogeographic region.)	
Assessor(s) & Date:	

SECTION 2: ELEMENTS OF THE PROGRAMME OF WORK ON MARINE AND COASTAL PROTECTED AREAS IN THE MEDITERRANEAN REGION

The Programme of work presented hereinafter is made of the following four elements:
Element 1: To Assess the representativity and effectiveness of the existing Mediterranean network of marine and coastal Protected Areas
Element 2: To make the Mediterranean Network of Marine and Coastal Protected Areas more comprehensive and more representative of the ecological features of the Region.
Element 3: To improve the management of the Mediterranean marine and coastal protected areas.
Element 4: To strengthen the protected area governance systems and further adapt them to national and regional contexts.

ELEMENT 1: TO ASSESS THE REPRESENTATIVITY AND EFFECTIVENESS OF THE EXISTING MEDITERRANEAN NETWORK OF MARINE AND COASTAL PROTECTED AREAS

Element 1 addresses a series of crosscutting issues; its results will facilitate the implementation of the activities suggested under the three other Elements.

6. Proposed activity 1.1: Evaluate, at national level, the status, the representativity and the effectiveness of the marine and coastal protected areas

Expected results: In each participating country, a comprehensive assessment of marine and coastal protected areas is carried out at national level (Analysis of strengths and gaps including: identification of underrepresented ecosystems, identification of areas in urgent need of rehabilitation and restoration of habitats, key threats to protected areas existing and potential forms of conservation, governance systems, lessons learned, identification of potential bilateral or multilateral protected areas, Evaluation of needs (technical assistance, financial, trainings, etc.).
The Criteria developed in Section 1 of this document will be used to assess the ecological representativity of the existing MPAs and to select MPA candidate sites. Where necessary, the assessment exercises will use also the results of the survey carried out by MedPAN to compile the Mediterranean Directory of MPAs.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: National teams of experts, including MPA managers.

7. Proposed activity 1.2: Compile a regional synthesis on the status, the representativity and the effectiveness of the marine and coastal protected areas

Expected results: Gaps, strengths and needs of the Mediterranean network of marine and coastal protected areas evaluated on the basis of the outcomes of the national evaluations (Activity 1.1).

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: RAC/SPA, with the support of partners (IUCN, MedPAN, WWF-MedPO)

8. <u>Proposed activity 1.3</u>: Regional expert (Country representatives) meeting onthe representativity of the Mediterranean network of MPAs.

Expected results: Needs and actions required for the development of a comprehensive and ecologically representative system of Mediterranean marine and coastal protected areas identified, taking into account the views and opinions of the country representative experts.

The partner organisations will be invited to attend the expert meeting.

Implementation Calendar:

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: RAC/SPA, with the support of partners (ACCOBAMS, IUCN and MedPAN)

ELEMENT 2: TO MAKE THE MEDITERRANEAN NETWORK OF MARINE AND COASTAL PROTECTED AREAS MORE COMPREHENSIVE AND MORE REPRESENTATIVE OF THE ECOLOGICAL FEATURES OF THE REGION.

9. <u>Proposed activity 2.1</u>: Identification of preliminary priority conservation areas

Expected results: The areas which are most ecologically critical for the Mediterranean are identified, including High Seas areas, transboundary areas and areas suitable for ecological corridors. This will be done according to the methodology and the criteria described in Section 1 of this document, including the subdivision of the Mediterranean into ecoregions.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: RAC/SPA, the results of this activity will be reviewed by the Expert meeting to be organised under Activity 1.3 and then submitted to the Meeting of the NFP for SPA, with the support of: ACCOBAMS, IUCN, MedPAN

10. <u>Proposed activity 2.2</u>: Strengthening of the Mediterranean network of marine and coastal protected areas through the creation of new protected areas, and where appropriate the extension of existing ones, in accordance with the results of the Activity 2.1 (Identification of priority conservation areas).

Expected results: The creation by 2012 of a coherent and ecologically representative Mediterranean network of marine and coastal protected areas.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: The relevant national authorities of the Contracting Parties, with the support of partners (ACCOBAMS, IUCN, WWF-MedPO).

ELEMENT 3: TO IMPROVE THE MANAGEMENT OF THE MEDITERRANEAN MARINE AND COASTAL PROTECTED AREAS.

11. <u>Proposed activity 3.1</u>: Evaluation of the management of each Mediterranean marine and coastal protected area.

Expected results: (i) The management effectiveness of the Mediterranean marine and coastal protected areas is evaluated and (ii) recommendations fir the improvement of the management of the Mediterranean MPAs.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: The relevant national authorities of the Contracting Parties, with the support of: partners (IUCN, WWF-MedPO, MedPAN)

12. <u>Proposed activity 3.2</u>: Training of the managers and other staff categories of Mediterranean marine and coastal protected areas. This activity will be carried out through the development and implementation of a regional training project whose components will be defined taking into account the gaps and needs identified under the Activity 1.1.

Expected results: The skills and qualifications of the managers and other categories of staff involved in the management of the Mediterranean marine and coastal protected areas are improved. As part of activity 3.2, a regional programme for the training of protected area staff will be developed.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: RAC/SPA, ACCOBAMS throw the programme “training to trainers”, sponsored by Italy, IUCN, MedPAN

13. <u>Proposed activity 3.3</u>: Elaboration of a regional strategy for the early warning, mitigation of an adaptation to the impacts of Climate change and Invasive species in the Mediterranean MPAs.

Expected results: The Mediterranean MPAS are adequately prepared to face the issues of Climate Change and Biological Invasions.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This Activity will be implemented by: RAC/SPA, with the support of: partners (ACCOBAMS, IUCN, MedPAN)

14. <u>Proposed activity 3.4</u>: Establish a framework for exchange between Mediterranean MPA Managers.

Expected results: Exchange and technical mutual assistance between the Mediterranean MPAs managers improved.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: RAC/SPA and MedPAN)

ELEMENT 4: TO STRENGTHEN THE PROTECTED AREA GOVERNANCE SYSTEMS AND FURTHER ADAPT THEM TO NATIONAL AND REGIONAL CONTEXTS.

15. <u>Proposed activity 4.1</u>: Evaluate the existing protected area governance types in the Mediterranean countries.

Expected results: The protected areas governance systems analysed (strengths, weaknesses, lessons learned) and options for their improvement/strengthening evaluated.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by: RAC/SPA. It will include assistance to countries to improve their national legislation in relation with the protected areas and the financing systems of their marine and coastal protected areas, with the support of partners (ACCOBAMS, IUCN, WWF-MedPO, MedPAN).

16. <u>Proposed activity 4.2</u>: Identify opportunities for the Mediterranean marine and coastal protected areas to contribute to the social and economic development at local and national scale, including poverty alleviation..

Expected results: Guidelines available to managers of marine and coastal protected areas on how better integrate their protected areas with their local context.

Implementation Calendar

Year 1		Year 2		Year 3		Year 4		Year 5	

This activity will be implemented by RAC/SPA. Further activities will be implemented by other partners (ACCOBAMS, IUCN, MedPAN, WWF MedPO)

Annex VII - Draft Guidelines for setting up and management of Specially Protected Areas for marine turtles in the Mediterranean

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INTRODUCTION

1. Conserving adult female turtles and their nesting habitats merits top priority in any conservation strategy. In the wild, a mature female will lay over many years, producing several hundred eggs per nesting season, for many seasons. This means that in her lifetime she could lay many thousands of eggs. Most eggs and hatchlings will normally perish on the beaches, as a result of predation, inundation by the sea and human activities. The number of hatchlings that reach the sea will be small, often estimated at a small percentage of the eggs laid. Many will perish during their first days at sea. Many young turtles will survive to a certain age but will perish before sexual maturity or soon afterwards. Many green turtle juveniles will die when they abandon the pelagic stage of their life and descend on their foraging grounds, when they are about 30-40 cm in length. There they get caught in stationary fishing nets. Loggerhead juveniles and sub adults seem to suffer more from floating long line problems in the Central and Western Mediterranean. For these reasons, it is obvious that the larger a turtle gets the more precious she is and, therefore, mature turtles merit top priority in any conservation programme. Their protection needs to focus primarily on key areas, on and near their nesting beaches, on their foraging grounds and in key migration passages (RAC/SPA 2007).

2. However, and not withstanding anything said above, the protection of nesting beaches, in the Mediterranean in particular, where beaches are under pressure from tourism and recreation activities, is a priority issue. Obviously without nesting beaches turtles cannot survive. The protection of nesting turtles on their nesting beaches and the protection of their eggs and hatchlings on the beaches provides a window of opportunity to help in a very practical way in the recovery of populations as, all things being equal, any significant increase in the number of hatchlings reaching the sea, through the control of predation etc will inevitably help in tipping the equation to the benefit of turtles. Many beaches have already been "lost" to the turtles.

3. Much of the conflict in turtle conservation is in fact related to protecting nesting beaches. This can be illustrated by the number of files that relate to nesting beach protection which have been opened by the Bern Convention (Fernadez-Galiano 2009).

4. The fact that turtles often migrate long distances between their natal beaches and their foraging grounds means that it is unlikely that any single protected area can protect turtles at all stages of their life. Protected areas therefore need to be set up in different areas in different countries, according to what area is important to turtles in that country.

5. Protected areas for marine turtles, as a result of their biology, need to cover habitats both on land and at sea. On land, protected areas need to cover the nesting beaches themselves and the hinterland behind the beaches, to the extent that this impacts nesting etc. Closely associated to the land area, is the sea adjacent to the beaches, where the turtles spend much of their time between laying. This sea area needs to be protected accordingly, to avoid disturbance and damage to turtles from any activities that can impact nesting turtles and hatchlings (fishing, water sports etc). Nesting beaches and the adjacent sea area and often the mating area are usually covered by the same legal regime and form a single coastal/marine protected area. Marine protected areas are needed to protect turtles on important foraging grounds. These primarily require protection from fishing activities. The foraging grounds are usually different for green and for loggerhead turtles, as their feeding habits are different. Green turtles usually graze in *Posidonia oceanica* and *Cymodocea nodosa* meadows, mostly in the Levantine Basin, feeding on these two

sea-grass species, (Demetropoulos and Hadjichristophorou 1995) but stretching, on a smaller scale, as far as the central Mediterranean, off Greece and Libya (Margaritoulis and Teneketzis 2003). Posidonia beds are mostly found from about 5m depth to a maximum of about 45m which is the deepest they are found in the Mediterranean (off Cyprus). The usual depth limit is 30-35m. Cymodocea is a shallow water seagrass found from a few cm depths to about 10m. Loggerheads feed mainly on a diversity of benthic animals and they often go west to the richer grounds of the central and western Mediterranean, including the Adriatic.

BACKGROUND INFORMATION

A. PROTECTION OF NESTING BEACHES

6. Mature female turtles cannot reproduce without nesting beaches - this much is obvious. What is not so obvious, but well known by now, is the fact that these females (and perhaps more so female green turtles), will not nest on any beach - they will only nest on their natal beaches, i.e., on the beaches where on which they incubated as eggs and where they hatched. So the existence of "suitable" beaches and the existence of mature female turtles in the Mediterranean do not mean that nesting will take place. The mature females need to be able to return to the specific beaches on which they originated so they can lay their eggs. This also implies that the Mediterranean stock of turtles is not a single stock but that each rookery has its own stock of turtles, i.e., that each rookery is demographically distinct and independent. Therefore, conserving turtles in one rookery will not save turtles from another rookery. If a rookery is to survive, therefore, it needs to be protected individually and separately (Bowen, 1992. Meylan 1990).

7. It also needs to be noted, that the beaches the turtles "choose" to lay their eggs on, are the result of the suitability of these beaches, as nesting grounds. It makes good biological sense, from an evolutionary point of view, to nest on a beach that proved good for the parent. In other words it is the result of a kind of "natural selection" that has approved suitable beaches and rejected unsuitable ones. Many factors play a role in this - one of them is temperature. Nesting beaches have the right temperature regime - otherwise they would not sustain populations. Of course it is not so simple. Coarse sand beaches have higher incubation temperatures than fine sand beaches in the same geographical area. So, some beaches have a tendency to produce more females and others more males. But a rookery as a whole has beaches with the right temperature regimes for sustaining a population. Inevitably sex ratios on the same beach vary with the time the eggs are laid, with more males at the beginning of the season and more females later on. There is a need, therefore, to protect the beaches throughout the nesting and hatching season, starting from the first nests lay in the season. In setting up protected areas for turtle nesting it is important, in view of all that has been said above, to select and protect not only "successful" nesting beaches but also all the beaches on which a rookery depends.

8. There are many reasons why a beach may not have regular nesting. Sparse nesting on a beach, that looks very suitable for nesting, may be the result, not of the suitability of the beach itself, but of the adjacent sea. Predominant low sea surface temperatures off a beach, or an area, are caused by upwelling, i.e., cold water coming to the surface from lower down. Upwelling is caused by currents and winds. Fluctuations in climate may affect sea currents and this may explain large annual or shorter term, fluctuations in nesting on some beaches. Examples of this are some south and south-western beaches in Cyprus (Demetropoulos and Hadjichristophorou

2008). Recognizing this fact is important in selecting areas to protect, and in setting up hatcheries in such areas.

9. In selecting the boundaries of the area to protect, the various threats to the nesting, incubation and descent of the hatchlings to the sea need to be kept in mind. Lights are a key issue as is disturbance by people at night. These can impact both nesting females and hatchlings in particular. Protecting the beach itself and any (often limited) sand-dune zone behind it may be very useful, but in many areas the threats come also from the adjacent hinterland and protecting the beaches alone has proven to be insufficient to protect reproduction. The width of the area that needs to be taken into consideration inevitably will depend on the morphology of the area and the existing or likely pressures.

10. The sea adjacent to nesting beaches is also very important for the protection of the turtles coming to the area to reproduce and management measures are needed to protect them from fishing and other nautical activities.

11. Climate change is of course likely to impact, at some stage and no doubt progressively, turtle nesting and distribution. Turtles themselves will also no doubt shift their nesting season to start nesting earlier, compensating by themselves for male/female ratios. Increased nest numbers are also likely, with changes in currents, with winds affecting surface currents and bringing warmer water into shallow waters etc. This has already been noted in Cyprus (Demetropoulos and Hadjichristophorou 2008). It is also likely that we will see a spread in nesting further west and with nest number increases in fringe areas in the central Mediterranean (Demetropoulos 2003a). The above need to be kept in mind in setting up protected areas as fringe area beaches, in the central Mediterranean in particular, with limited nesting at present, could become important in the future. Of course, as turtles are long living animals, populations and spatial shifts in nesting will take many decades if not centuries.

B. LEGISLATION AND ENFORCEMENT

12. Legislation is necessary for the setting up of protected areas. The legislative vehicle for such measures may well vary from country to country. The legislative/administrative gaps existing, due to the fact that in this case marine species have to be protected on land, are often highlighted. Countries have resolved this in different ways, with varying degrees of success. It is obviously better to have an overlap than a "no man's land", though overlaps can also lead to inaction and sometimes conflicts. It is prudent to keep in mind that any "discounts" in the area to be protected may well be paid for by radically increased costs in actually managing the area.

13. For EU Countries (and counties aspiring to EU membership) the Habitats Directive provides for habitat protection of all species in Annex II. Both loggerheads and green turtles have been classed as Priority Species for conservation and are included in both Annex II (Animal and Plant Species of Community Interest whose Conservation Requires the Designation of Special Areas of Conservation SACs/pSCIs) and Annex IV (Animal and Plant Species of Community Interest in Need of Strict Protection). Guidelines are available for setting up Natura 2000 sites as well as Criteria for assessing the sufficiency of any proposals for habitats and species under this Directive ('Criteria for assessing national lists of pSCI at bio-geographical level (Hab. 97/2 rev. 4 18/11/97)).

14. The general provisions are that, for priority habitats and species, more than 60% of the area of the habitat or population in the country needs to be covered by SACs for a Member State to fulfil its obligations under the provisions of the Habitats Directive. Additional guidelines for assessing sufficiency of Natura 2000 proposals (SCIs) for marine habitats and species are now being elaborated. However it needs to be kept in mind that there are limitations in what the Habitats Directive can do in protecting habitats and species.

15. Both the Bern and Barcelona Conventions have provisions for conserving turtles and their habitats, without perhaps the mandatory nature of an EU Directive. The files opened by the Bern Convention for contraventions of the Convention are also relevant.

16. In setting up a Protected Area for turtles it is highly desirable that, even before the setting up the Protected Area, decisions are taken, where possible, for the management authority to be the same as the law enforcement authority or, at least, work very closely with it. More effective implementation of regulations and management measures can in this way be achieved, than if nature conservation issues depend on a more general law enforcement body, like the police, with many diverse duties and, often, with different priorities and more pressing work and responsibilities.

17. Setting up a Protected Area may be a relatively easy task, in some cases at least, but the setting up needs to be accompanied by a set of basic management regulations to start with, to be included in the law, if setting up the protected area it is to be useful in its main target, which is to protect turtles. (The remaining more detailed management measures can follow the setting up of the protected area). It also needs to be kept in mind that wardens will be needed and that law enforcement needs to be undertaken directly by wardens/rangers of the national management authority (this needs to be reflected in the legislation) and not be relegated to indirect enforcement (warnings) by volunteers working in turtle conservation projects. Wardens/rangers of the management authority need to be professionally trained in all aspects of their work in law enforcement. Volunteers however dedicated and well meaning they may be cannot be as effective as a properly trained, uniformed law enforcement agent. Nonetheless valuable work is often undertaken by volunteers in the absence of national agents on the scene.

In order to provide decision-makers and lawyers with the relevant basic information and practical advice about elaborating and implementing effective legal measures for the conservation of Mediterranean marine turtles, bearing in mind the existing international legislation, RAC/SPA has elaborated Guidelines to design legislations and regulations to the conservation and management of marine turtles populations and their habitats and already adopted (Catania, 2003).

C. SETTING UP MARINE PROTECTED AREAS FOR TURTLES

18. Apart from the protection of the marine areas adjacent to nesting beaches, which aim at protecting turtles during the nesting season and occasionally just before it, during mating in April/May, there is little or no experience in protecting turtles on their foraging grounds (Mating areas are often a little further out to sea than the area needed for the protection of nesting turtles). Inevitably protection of turtles on their foraging grounds will aim at protecting turtles from fishing activities and from occasional boat strikes. To justify the declaration of such an area as a

Protected Area and to introduce at the same time the basic management measures, which will impact fishermen primarily, the importance of that particular foraging area for turtles needs to be substantiated. This needs to cover *inter alia* the justification of its boundaries and the reasons for selecting this area and not other nearby areas. This will help decision makers justify their decisions. Closed areas to fishing are obviously the most effective, but the most difficult to have accepted.

19. Such protection of foraging areas for the green turtles may be a little easier to pass into law, in the European Union countries at least, as such protection goes hand in hand with the protection of the *Posidonia* beds, which are a priority habitat in Annex I of the Habitats Directive. The same is applicable, to a degree, to the protection of the Sand Banks which are also a habitat in Annex I, which requires protection under the Habitats Directive. *Cymodocea nodosa* is often related to Sand Bank habitats. This species is the main seagrass species on which juvenile and sub-adult green turtles and to a degree, adult green turtles feed on in the Mediterranean. Again, in this case, and where quantitative data on habitat coverage are available, it is possible to apply the arbitrary sufficiency levels 20-60% for non-priority habitats and >60% for priority habitats (e.g., *Posidonia* beds) as suggested in the 'Criteria for assessing national lists of pSCIs at the biogeographical level' (Hab. 97/2 rev. 4 18/11/97). In this case also the "Additional guidelines for assessing sufficiency of Natura 2000 proposals (SCIs) for marine habitats and species" which are now being elaborated are relevant.

20. Again here it needs to be mentioned that both the Bern and Barcelona Conventions have provisions to protect turtles and their habitats, without perhaps the mandatory nature of an EU Directive.

GUIDELINES FOR SETTING UP PROTECTED AREAS FOR MARINE TURTLES AND BASIC MANAGEMENT MEASURES

These guidelines should be read in conjunction with the background information given above

A. NESTING BEACHES AND ADJACENT SEA

A. 1. Selecting areas to protect

1. Most of the important nesting beaches in the Mediterranean are already known and many have been monitored for several years. Much has been said already on the significance of saving existing nesting beaches. The biology of turtles is such that leaves little leeway in the selection process for beaches and also predetermines, to a large degree, the extent of the area needed and the basic management measures that need to be implemented. In setting up a protected area it is strongly advised that all the beaches the rookery depends on are included as they may have different physical/geological characteristics which can impact sex ratios of hatchlings The area to be protected needs to include not only the beaches and immediate coastline but also a zone behind the beaches so that threats, such as lights, can be avoided, or if this is not feasible due to existing development, at least controlled and minimized. The extent of this zone will need to be judged case by case, depending on the morphology of the area, the stage of any development etc.

2. In setting up Protected Areas, it may be unrealistic to endeavour to declare as a protected area the total length of very extensive beaches with only sparse nesting.

In such cases, selecting adequate stretches of coastline in the areas with the densest nesting is indicated (keeping in mind of course what has already been said about the characteristics of beaches in relation to sex ratios). The rest can be covered as much as possible by management measures, such as no driving on beaches, regulating the hours of mechanical cleaning, if this is taking place, and a hatchery programme endeavouring to concentrate future nesting in protected areas. This is the current strategy in Israel (Kuller, 1999) and the one most likely to be effective also in other areas with extensive beaches and sparse nesting, where in situ protection of nests may not be feasible for a variety of reasons.

3. In the adjacent waters it is desirable to cover the sea to a certain distance from the shore. This will depend on the slope of the seabed. It better to foresee for a depth limit instead of a distance from the shore as this is more practical to implement on the ground as fishermen and many boat owners cannot judge the distance for the shore but can measure depth with echosounders or by a dropping a line. Implementation will also of necessity be undertaken from the patrol boats of the law-enforcing authority which are invariably equipped with echosounders. In Cyprus the depth limit off the Lara/Toxeftra Reserve is the 20m isobath, which is about 1 - 1.5 km from the shore, which is adequate for this area.

4. It is recommended that, if a seasonal applicability of the Protected Area is envisaged, this covers the period between the 1 May and mid October. This will cover both green and loggerhead turtles. Green turtles do not start nesting until early June while hatching finishes in October. Loggerhead start and finish earlier. It needs to be kept in mind that some measures, like driving on the beaches, are best implemented throughout the year.

A. 2. Legislation

5. In setting up a Protected Area there is a need to pass legislation. This legislation should be clear as to what it covers in terms of:

- Spatial cover, both on the coast and in the sea. The terrestrial area to be covered will of necessity depend on such factors as the morphology of the area (hinterland slopes etc). The social set up and the acceptability of the protected area will no doubt mean that compromises may have to be made, not only in the spatial coverage of the protected area, but also in the management measures themselves. Obviously it easier to set up protected areas in areas where there is as yet no development or development aspirations. Once development starts setting up protected areas is more difficult and also likely to be more expensive, not only initially but also in managing the area later on.
- The period of the year during which this legislation, or part of it, is applicable (see para A.4 above)
- The key management measures (see below). These may have a bearing also on the extent of the area to be protected.

The above are also applicable to a degree to the marine component of the area.

A.3. Management of nesting beaches and adjacent sea

6. The setting up of a Protected Area needs to include the basic regulations/restrictions

which will be applicable in it. For example it is necessary to include at least the basic beach management measures during the nesting, incubation and hatching period, while some of the measures (like driving on the beaches) are needed throughout the year. These are in addition to any spatial planning aspects of the protection of the area from physical development or to its status as a National Park, Marine/Coastal Reserve etc. Seasonal management measures should restrict or control and properly channel, public access in the nesting areas. These measures need to include the sea area adjacent to the beaches to a depth limit (or distance from the shore) that may vary from place to place depending on a number of local factors.

7. The basic management measures for any area may vary somewhat depending on circumstances, existing or pending threats etc. Only some need to be examined at the stage of setting up a protected area. Others can come later (for example methods to deal with predation). The following recommendations are broadly based on the legal measures that are implemented in the Lara/Toxeftra Turtle Reserve in Cyprus, which was set up in 1989. This is an area in which there is, as yet, no physical development.

   For the period starting on the 15 May (or 1st May) and until the 15 October the following measures are needed:

   - The public should not be allowed on the beaches or near the beaches at night, i.e. starting one hour before sunset (or at sunset) and finishing at sunrise. This is a critical issue. [The extent of the land area to be covered inevitably depends on local circumstances (such as land morphology in the hinterland) but should aim at a zone which will result in the minimum disturbance to nesting turtles and emerging hatchlings (e.g., from movement of people on the beach, from stationary or moving lights (cars, torches etc), bonfires etc). See A3 above.]
   - Driving of vehicles on the beaches should be forbidden.
   - Sun beds, umbrellas, camping etc. should be forbidden on the beaches.
   - Boats of all kinds and fishing of any kind (except with a rod and line) should be banned from the sea area adjoining the beaches to a specified depth (at least to the 20m. isobaths, and deeper if the mating areas are to be covered) or to a set distance from the shore (1.5 km or more, depending on the location). The depth limit is more practical to implement as this is what fishermen understand and can implement and this is what can be measured in practical terms in terms of proof for court cases.
   - Some key management measures in the Lara/Toxeftra Turtle Reserve and elsewhere in Cyprus are not mentioned in the legislation, as this is not necessary. The main one is the control of predation from foxes. This is done by the use of special protective cages placed on all nests in situ.

   The public should be suitably warned with appropriate notices at the periphery of the protected area and in the vicinity of the beaches.

8. Infrastructure in protected areas should include, where appropriate, well placed information/visitor centres and well demarcated access paths with provisions for the protection of sand dunes and the reduction erosion and disturbance. Walkways over the sand dunes may be needed in places. (These are common in Florida and South Carolina in similar circumstances).

9. In cases where there is already some development in the area, the measures to be taken are of necessity more mitigatory in nature (with varying degrees of success) and what realistically can be implemented will depend on the nature and degree of development. Such mitigating measures are more likely to help in the case of

Loggerhead turtles, but are less likely to be effective with Green turtles, which are more sensitive to disturbance (movement, lights etc). The management measures of the beaches and adjacent sea area, already mentioned above (A.3.7) are applicable here also.

10. Where development has progressed too far or is foreseen to continue, it is desirable to restrict as much as possible interference from existing or new installations and activities by several measures that, in many cases, need to be implemented concurrently:

    i. Restricting the operation of isolated restaurants, cafes, etc. to daylight hours of work.

    ii. Setting a minimum distance between any new buildings and the beach. The distance will inevitably vary depending on many factors, such as the morphology of the area, the height of the buildings etc

    iii. Adopting regulations regarding lights directly visible from the beach or for lights near the beach. Shading and control of lights by various methods is possible and effective to a degree. [*The State of Florida developed a Model Lighting Ordinance for Marine Turtle Protection, Chapter 62B-55, which is intended to guide its own counties in creating their own lighting ordinances. This is annexed to this paper as it gives very valuable detailed information and insight into the problems faced and the solutions given. It is underlined here, again, however, that this model ordinance as well as the report mentioned lower down in this paragraph, is applicable basically to Florida and the USA and that the situation of administrative control and law enforcement etc in the Mediterranean is such as to make the effective implementation of such measures, at best, highly questionable. The model ordinance is annexed to this report as a target to aim for and should not be accepted at face value as "justification" for applications aiming at obtaining permits for development in or near sensitive areas. More information on the control of lighting is available at the web site of the Bureau of Protected Species Management (BPSM, 2000). The Florida Marine Research Institute has also produced a Technical Report titled "Understanding, Assessing, and Resolving Light Pollution Problems on Sea Turtle Nesting Beaches" (Witherington and Martin, 1996). This gives background information and discusses solutions to lighting problems*]. Realistically however the degree of success in implementing such measures in the Mediterranean needs to be carefully assessed. (Demetropoulos 2003b)

    iv. Restricting traffic at night on certain roads which have a direct eye-contact with the beaches or by taking measures to hide the lights from cars, e.g. by setting up fences, hedges etc.

    v. Restricting or controlling or banning the presence of people on the beaches at night during the nesting season, is critical.

    vi. Stopping mechanical beach cleaning or, at worse, regulating the hours of any mechanical beach cleaning, so that time can be given for the location, protection or relocation of nests.

    vii. A hatchery may be needed. This will depend on the degree of development, threats etc. and each case needs to be assessed on its own merits after a careful assessment of the situation. Care should be taken so that the setting up

of a hatchery does not provide an excuse for further development. It should also not be used as an excuse to downgrade other, perhaps more significant turtle conservation activities such as minimizing disturbance to nesting females or in situ protection of nests (see A.4. below "Selecting areas for setting up hatcheries")

viii. If the passage of boats in the coastal zone of the protected area cannot be prohibited completely, which is highly desirable, then restrictions need to be applied. Inevitably they will be mitigatory in nature. Speed limits (less than 6 knots) may be foreseen for example, though enforcement will probably be problematic in such cases. Prohibiting fishing in that zone in the nesting season is necessary.

11. In managing protected areas, capacity building in any team managing a protected area is critical. Protected areas are areas in which conservation is the primary aim. Research activities may of course be necessary, but these should not be at the expense of conservation.

12. Following the setting up of a protected area well thought out conservation practices to be used need to be followed (Demetropoulos and Hadjichristophorou 1995 and 2008). Priority needs to be given to protecting nests in situ, from predation etc, wherever possible. Relocation of nests needs to be kept to the minimum as this is a complex issue with many pitfalls, though no doubt necessary in some cases. Relocation up the same beach is necessitated in cases of nests laid low down on the beach, which are likely to be swamped by high seas. Relocation to a hatchery is necessary for nests laid on very touristy beaches, where turtles have no future, and/or from areas where the nests cannot be adequately protected in situ from people (driving, steeling of eggs etc)

13. The basic aim is to keep any intervention with nests and hatchlings, at any stage, to the minimum. Let nature take its course if possible (except in the case of predation, as the state of turtle stocks is such that predation needs to be curbed). More comprehensive guidelines regarding actual conservation practices are given in the Manual for Marine Turtle Conservation in the Mediterranean and its Addendum 1 (Demetropoulos and Hadjichristophorou 1995 and 2008).

A. 4. Selecting areas for setting up hatcheries

14. If a "hatchery", is needed to be set up in a Protected Area, as a result of the need to relocate nests, it needs to be kept in mind that the hatchlings will imprint on the area of the hatchery and will, in time, return there to lay their own eggs. It is, therefore, necessary to select an area that will be safe for them to return to, 30 years or so later, when they mature. (Do not set up hatcheries and do not relocate nests to beaches that are already "developed" or are likely to be "developed" for tourism etc.) It is therefore best to have hatcheries in protected areas. "Hatchery" means an area on a beach to which eggs are relocated to and reburied in the sand.

15. It is best to set up hatcheries on known nesting beaches as these fulfil all the parameters needed for successful incubation, hatching etc. This is proven by the existence of a nesting population there (but keep in mind what has been said in para 7 and in para A.1.1).

16. If large scale relocation needs to be undertaken, as in the case of sparse nesting on long beaches, where nests are difficult to protect, or in the case of areas where

eggs may be stolen or destroyed, make sure that the beach chosen to have the hatchery on, will produce a good balance of both males and females. This may be derived from the temperature regimes of nests in that particular rookery. Keep in mind that in nature the female/male ratios are largely unknown and may not necessarily be 1:1. Putting all your eggs in any one basket (one hatchery) is not wise. Setting up hatcheries on different beaches in such cases (of large scale relocations) may be more prudent.

B. SETTING UP MARINE PROTECTED AREAS FOR TURTLES

17. In this case what is first needed is the substantiation of the claim that any sea area (areas) proposed as a protected area for turtles in fact needs protection. It also needs to be substantiated that that particular area (areas) is more important than other similar areas in the same country. This implies the collection of appropriate data over several seasons and probably over some years. Some such data are already available of course in some cases but it is questionable if the information available is enough except for a few cases. Setting up marine protected areas on inadequate data may backfire and result in difficulties in the future in setting up such areas as suspicions will arise.

18. The process for setting up a marine protected area, after such substantiation, is similar to that mentioned already for nesting beaches and adjacent waters, as far as legislation etc is concerned.

19. What need to be covered in setting up such a protected area are again the boundaries of the area and the basic management measures (primarily the restrictions to pertinent activities) in that area. These will mainly relate to fishing and the passage of boats.

20. Closed areas are one option, but these are unlikely to be extensive, as they may jeopardise the livelihood in many cases of artisan fishermen. This needs to be kept in mind in any proposals for such protected areas, if they are to be accepted. Fishing restrictions may be more feasible and these relate to the gear, the use of which is to be allowed, the timing of fishing activities (for example the time of setting and hauling of stationary nets). Restrictions also need to apply to trawling (again restricting the duration of hauls so that turtles can be brought up alive). Spatial modelling tools could be used to guide surface fisheries away from loggerhead turtle clusters where by catch rates can be extremely high (Eckert 2008, Sagarminaga, 2008, Sagarminaga *et al*., 2008).

21. Protecting key migration passages, in the spirit of the Action Plan for the Conservation of Marine Turtles in the Mediterranean (RAC/SPA 2007), may be premature at present, for most areas. In most cases, more information is needed to substantiate what is a key migration passage. The passage of a very small number of satellite tracked turtles through an area is unlikely to be accepted as solid evidence of a key migration passage. Jumping to conclusions on too few data may jeopardise the wider credibility of turtle conservation activities. Migrations are temporal in nature and any restrictions to fishing etc in such areas will need to be only in the periods of such migrations to and from the nesting beaches.

22. What has already been said for the marine areas adjacent to nesting beaches is largely applicable also to Marine Protected Areas for foraging grounds and key migratory passages.

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Annex VIII - Draft Guidelines for Developing Marine Turtle Strandings Networks and Protocols for Data Collection

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I. INTRODUCTION

Strandings constitute a very important source of information and knowledge on marine turtle populations and also on other groups of threatened animals such as cetaceans and some elasmobranchs. Such knowledge is of great importance for conservation. A stranded animal is infact a mine of information on biology (growth, reproduction, etc.), ecology (migration, population, diet etc.) and health (toxicity, parasites, etc.). Furthermore, the presence of stranded animals on the beach would indicate that incidental fishing was happening in the region and the study of strandings could give an idea about the level of bycatch. However, the method remains rather unreliable. Research on stranding activities should be done in all Mediterranean countries. But much has to be done to set up more homogeneous strandings networks on all national coasts to improve communication, the flow of information and the collection of stranded specimens in a centralised site, to provide regular reports on strandings and to promote the scientific use of the biological material obtained within the network.

Among the priorities of the Action Plan for the Conservation of Mediterranean Marine Turtles, adopted in 1989 and revised in 1999 and 2007, it is stated in Paragraph III.2 on research and monitoring that it is necessary to improve knowledge about data collection via the strandings networks.

To this end, the Plan provides for the drafting by RAC/SPA of protocols for data collection on strandings of marine turtles, for the Contracting Parties to set up strandings networks.

The present report falls within the framework of implementing the Action Plan for the Conservation
of Marine Turtles, and aims at:

- Helping the countries in developing marine turtle strandings networks alongside other networks, on cetaceans, for example
- Drafting protocols for data collection via stranded turtles.

The present report first takes stock of the state of knowledge on the strandings networks that exist in the Mediterranean, in particular on marine turtles, and analyses their weak and strong points.

II. STRANDINGS NETWORKS EXISTING IN THE MEDITERRANEAN

To get an idea about the strandings networks existing in the Mediterranean we have mainly used books, contacts with some experts at the Third Conference on Marine Turtles (Yasmine Hammamet, Tunisia, 20-23 October 2008) followed by a request for information on strandings networks in the Mediterranean using a questionnaire (Annex 1). However, we received few replies.

II.1.Importance of strandings networks and groups of species concerned

Marine turtles are seriously threatened throughout the Mediterranean region. Human-origin and natural mortality is great. A recent upwards trend of dead stranded turtles has even been noted in several parts of the Mediterranean. There were more strandings in 2007 and 2008 than have

been recorded since 1990 (Aliki Panagopoulou, medturtles). Similarly, in the northern Adriatic, over 220 km. of coast, there were 144 strandings in 2007 (134 dead individuals), the highest figure since 1993. Usually 100 specimens are recorded each year (Marco Affronte, medturtles).

On the Mediterranean coast of Morocco, an increase in strandings has been noted for lute turtles (Alvaro G. de los Rios y Loshuertos, medturtles). However, there is very little information on marine turtle strandings in the Mediterranean, especially when compared with the data collected in the context of the marine turtle strandings and rescue networks in the United States.

In the Mediterranean, few national networks deal with marine turtles. However, from time to time sketchy, sparse studies on stranded turtles by small teams are published, but these rarely make full use of a stranded turtle or put the information and samples at the disposal of scientists. In many countries each researcher collects his/her data on the beaches where s/he works. There are sometimes scientific reports now and then from local or public NGOs. As a result, information on stranded turtles is rather sketchy, either between scientists or local NGOs. Networking such activity on a national or even regional scale is necessary.

Marine turtle strandings networks on a national or local scale have been developed in certain countries and work relatively well. We cite in particular Greece, Spain, Italy and Tunisia. In the last country the network concerns both marine turtles and cetaceans.

Some networks are now very old and have been improved over time with the collection of data. Already in 1988 Valencia University (Spain) set up its network on the Spanish coast of the central Mediterranean. The ARCHELON association developed a national network in Greece in 1990 (300 stranded turtles/year are on average sighted by 236 stations involved in signalling strandings along the Greek coast). In 1992 the Naples Zoological Station (Italy) set up a local marine turtle strandings network along Italy's south-western coast.

The situation is not much better for cetaceans but it should however be said that much has been done recently for cetacean studies and the setting up of cetacean strandings networks. These networks (six or seven for the entire Mediterranean) could develop to simultaneously handle turtle strandings or even strandings of other predator species at the top of the food chain, such as sharks.

Since the remains of the world *Monachus monachus* monk seal population is mainly found in Greece, monitoring of strandings of this species is mentioned there.

No shark network exists in the Mediterranean. Some sightings have however been recorded in the MEDLEM (MEDiterranean Large Elasmobranchs Monitoring) database.

II.2.Institutions involved and cooperation with other networks

Usually, when it exists, a strandings network is an initiative of research or university institutions or of a NGO, supported by the authorities.

The strandings networks set up enjoy close collaboration with:

- Especially, marine turtle rescue and care centres that have now been developed in many Countries
- Tissue banks. In the Mediterranean, two tissue banks are known:
    - The Padua Bank

A tissue bank for Mediterranean marine mammals
Department of Experimental Veterinary Science, University of Padua
Vialle dell'Università 16 35020 Legnaro – Agripolis (PD) – Italy
Web site: http://www.sperivet.unipd.it/tissue bank/

The Barcelona Bank
GRUMM-GBC, Department of Animal Biology (Vertebrates), Faculty of Biology, University of Barcelona 08028 Barcelona – Spain

- other strandings networks like MEDACES (Mediterranean Database of Cetacean Strandings). This database was set up to coordinate all national and regional efforts for countries bordering on the Mediterranean. This project was created in accordance with the Barcelona Convention, extended to the ACCOBAMS area. It is currently funded by the Spanish Ministry of the Environment, and rural and marine affaires. (http://medaces.uv.es/home_eng.htm)

II.3.Data collection and presentation

All the networks or even individual researchers have a data collection file. Standardisation of the data collection file was deemed necessary for the Mediterranean region. A database was set up as a result. It should be said, furthermore, that few of these structures bring out a regular report on marine turtle strandings.

II.4.Pertinent results

Marine turtle strandings happen along the entire Mediterranean coast and principally concern the *Caretta caretta* loggerhead turtle, which is anyway the most common in the Mediterranean, with known major nesting and feeding areas. Strandings of the *Chelonia mydas* green turtle are regularly observed, mainly in Greece and Turkey. The lute turtle is rarely seen on the Mediterranean coast and a stranding of this species can be seen from time to time. Anyway, there are more strandings of the lute turtle on the Moroccan coast near to the Atlantic (Alvaro, 2008), since this coast represents the most important wintering area in the Mediterranean for the species (Alvaro, 2005).

About a quarter of the strandings are the result of fishing activities and as many or more die from boat accidents, which peak in the summer, especially on the northern shore of the Mediterranean. Fishing problems are observed throughout the year and in all the Mediterranean countries. Several turtles die from bad health conditions, conditions that prevent them feeding before being stranded, or after ingesting human-origin debris. Compared to captured turtles, prey is infrequent and not abundant and debris is abundant in the contents of the stomach, composed of benthic and pelagic prey.
The size classes that are most represented in strandings are those of juveniles and sub-adults (CCL between 50 and 70 cm.).

We can also note several other results:

- Collection of historical data (data over 20 years old)
- Important knowledge on parasitology, feeding ecology, epibionta, cetacean and marine turtle genetics
- The rehabilitation and liberation of dozens of marine turtles in certain rescue centres

- Success in public awareness on species and the need for conservation
- Detection of the most important human-origin threats (including fishing) that affect marine turtles and cetaceans
- A marking/tagging programme is usually grafted onto the network's activities.

A list, which is not exhaustive, appears in Annex 2 to this report.

III.GUIDELINES FOR DEVELOPING MARINE TURTLE STRANDINGS NETWORKS

III.1. Aims

The ultimate goal of a stranding network is the conservation of marine turtles. However, the objectives of such a network should focus on:

- Provide data on the spatio-temporal distribution along the coasts of the concerned country (report regularly on strandings)
- Alert on cases of mass stranding
- Collaborate with tissue bank by providing samples
- Awareness (decision makers, fishermen, the public etc ...)

III.2.The necessary means

To attain such aims, collecting the appropriate information from a stranded live or dead turtle requires team organization for quick and effective response with the appropriate means. For this to work well, a strandings network should possess:

- a warning mechanism (24/24 hour phone service) to quickly signal the stranding of live, wounded or dead turtles
- an action team on the spot to report the event
- equipment to examine and transport the animals when necessary
- a data collection protocol
- facilities for treating and rehabilitating live animals
- facilities for doing autopsies on carcasses
- staff (veterinary biologists) who are qualified and trained for such intervention (determining species, measuring, necropsy, rehabilitation, etc.) and/or working with specialist institutions
- several involved institutions: research institutes, universities, NGOs, fishing administrations, ministries of the environment, of defence and of the interior, rescue centres, tissue banks

But it must be said that setting up, developing and managing strandings networks should not give rise to enormous expense and should not be subordinated to this economic aspect. In the same way, a strandings network on marine turtles could concern other predator species at the top of the food chain and that are endangered, like cetaceans, elasmobranchs and even seabirds.

III.2.1. Team organisation and the sighting of strandings

The strandings network to be set up should concern the country's entire coast. However, according to the length and features of the coast, the general context of the country and the

status of the marine turtles, several work teams could be envisaged. Each team is coordinated by a leader; a national coordinator coordinates the activities of all the teams (Bradai *et al*., 2008).

An awareness effort and requests for aid and collaboration from the various users of the sea and the authorities would be necessary so that information reach the work groups. Information on the importance of studying strandings and the names of the various actors with their respective cellular phone numbers (a non-paying green number for this is advisable) should be widely circulated to the target administrations and people.

III.2.2. Rules of intervention in the field

The action of experts in the field must bear the following in mind:

- quick action by the experts after a stranding is signalled (make sure the necessary material for the terrain is available and ready for use)
- coordination with the authorities, volunteers and institutions involved in the network
- respect for public health
- avoid stress for live animals
- scientific decision-making

III.2.3. Basic field equipment

- latex gloves
- data collection files
- „waterproof' markers
- measuring equipment (tape measure, calliper rule) and weighing equipment (scales,
- dynamometer)
- knives, scissors, scalpel, plastic knives, string
- appropriate bottles for the various samples
- aluminium foil and unused plastic bags
- coolboxes
- chemical products (alcohol, formalin, etc.)
- first aid kit
- photo and video cameras

III.2.4. Basic data collection

The basic information to be collected after a marine turtle stranding, and that should be the subject of a file (Annex 3) if as follows:

- name, address and phone number of the observer
- code of the region where the stranding happened when there are several teams in the national network
- date and hour of the stranding or of the observing of the carcass
- exact location (latitude/longitude, place)
- exact identification by a qualified person and description of the animal (size, weight, sex, colour, etc.). A photo is highly desirable. A key for determining Mediterranean marine turtle species appears in Annex 4
- condition and state of the turtle (live, recently dead, moderately decomposing, severely decomposed, dried carcass, remains of skeleton) (Annex 5). If the carcass already smells bad, the turtle is not recently dead.

The stranding report must also mention and locate on the body any anomaly, wound, collision accident, pollution by hydrocarbon, presence of marks, epibionta, remains of fishing gear – nets, hooks etc.

The historical data gathered here would constitute an important database and mainly serve to determine:
• the distribution in time and space of the strandings (include stranding on egg-laying sites)
• the stranded species
• the causes of death or damage
• the sex ratio
• the size

The veterinarian database developed by RAC/SPA in collaboration with the University of Murcia could be used to collect the data.

Causes of death

Although many causes of death are uncertain after examination of the stranded animal, some deaths can be easily attributed to the following causes:

- Natural causes
  - Predation
  - Environmental factors (storms,…)

- Human-origin causes
  - Fishing activity (presence of hook, turtle entangled in nets or ropes)
  - Collision with boats and propellers/fractures
  - Ingestion of foreign matter (plastic bags, etc.).
  - Intentional killing

The data gathered must be analyzed and checked against existing data on the fishing effort, the size of the fleet, the fishing gear used and the interaction with fishing.

Taking samples of parts of the body and organs where the stranding happened or after autopsy in a laboratory is also to be anticipated for possible studies on the life cycle and health of marine turtles. Work protocols for the taking and conserving of samples of tissues and other things must be crafted beforehand (see below).

III.2.5. Necropsy and the taking of samples

The first examination is the inventorying of the event, the describing of the species and the acquiring of biometric data. Necropsies (autopsies) aim at assessing the causes of death, the pathologies and parasitism of the stranded animals, and any other memorable fact. The information obtained supplies information about the state of health of the animal and populations, age classes, reproductive health, etc. The samples allow biological material to be acquired that is needed for various analyses, especially toxicological ones. Moreover, they enable a bank of tissues available to be built up later, particularly during specific national or international research programmes.

According to the case, necropsy could be done *in situ* or in the laboratory (Annex 6).

Taking and storing samples

Taking samples for additional analyses and examinations that are specific to the pathologies and life cycle of turtles is preferably only done on dead animals that are in a good state of freshness (firm, intact skin, animal that has not swollen up, viscera that are not distended by putrefying gases, etc.).

When the animal is in a state of advanced putrefaction (lacerated skin, viscera distended by putrefying gases, very rotten smell, etc.), the sampling would be restricted as far as possible to the digestive contents after opening up the esophagus, and to the muscles.

Two labels should be placed on the samples of tissue, liver, spleen, gonads, stomach contents and parasites, one on the inside and the other on the outside of the container. Each label should show:

- the reference of the autopsy or the animal
- the date of sampling
- identification of the tissue
- the destination of the sample (histology, microbiology, parasitology, toxicology, biology, genetics).

The epibionta attached to the animal's body and the humerus of the carcasses are also retained for respectively studies of migrations and of age.

The precautions to be taken for the different samplings, the fixatives and the storage techniques are set out in detail below.

III.2.6. Tissue bank

Strengthening a strandings network and achieving its objectives involves *inter alia* setting up a tissue bank on a national scale where specimens and samples from the network are stored and made available to the scientific community on request. Where means are lacking, collaboration with Mediterranean tissue banks is desirable.

Ideally, each Mediterranean country that is a Party to the Protocol on Specially Protected Areas and Biological Diversity would set up its own bank. However, a coordinated Mediterranean network should be set up to act as a link between the various tissue banks.
Contacts, exchanges and research programmes should follow the CITES protocols and national and international legislation on threatened species.

The tissue bank aims at receiving and freely distributing samples of animal tissue and information on these animals. The bank should represent a link between research groups that are active in the strandings networks and scientists in that country or the entire Mediterranean.

The bank's aims are the following:

- Collecting and storing tissues systematically and in well documented fashion
- Providing histology samples for retrospective or new analyses of interest
- Comparing the results over time
- Conserving tissues for genetic studies

• Storing biological liquids.

The bank takes samples of all the organs of stranded animals and keeps them in 10% neutral buffer formalin, DMSO, alcohol or frozen; the bank also keeps biological liquids for biochemical studies.

III.2.7. Treating and rehabilitating stranded live animals

These facilities are found in marine turtle rescue centres, now developed in many Mediterranean countries. Such centres could make an effective contribution to the work of the national turtle strandings network, mainly by:

• Necropsy of some dead turtles in the laboratory to determine the cause of death
• Treating and rehabilitating live or tired stranded turtles that have been brought in when incidentally captured.

Transporting a live (sick or wounded) turtle should be done in a controlled environment and extremes of heat and cold should be avoided. Ideally, the turtle must be protected from dehydration during the journey by the application of a thin layer of Vaseline, for example, over the shell and the soft tissues (except for the eyes). In order to prevent dehydration, it should be avoided the use of wet towels in winter or during transport in an air-conditioned car
The transporting or moving of live turtles, carcasses or samples within or outside the country usually requires permits from the appropriate authority.

On its arrival in the centre, the turtle will be given a full examination and appropriate therapy, when necessary. Several other problems, frequently found, are effectively treated in a rescue centre: pneumopathy, superficial and deep wounds, removal of hooks, difficulties for diving and immersion.

The water temperature during the care treatment must not be less than 17°C. Individuals kept in a good condition will later be marked and released.

III.2.8. Training staff

The team involved in the strandings network must be qualified and experienced. To this end, participating in training courses is vital for recognising species, conservation biology and doing autopsies on marine turtles. Similarly, participating in seminars and workshops on such subjects is called for. The training courses RAC/SPA organises or supervises, and which are thus beneficial for the staff in question, are:
• A course on monitoring marine turtle egg-laying beaches at the Lara hatchery (Cyprus)
• A course on marine turtle care and rescue at the Naples Zoological Station (Italy)
• The Biology and Conservation European course on Marine Mammals in Valencia (Spain).

III.3. Biological, Ecological and Health Studies

Once a national network is in place and running, an additional effort must be made to make sure the information from the biological material is available for the study of the pathological and genetic causes of death, and the general biology of local populations. This action is vital; a strandings monitoring network, even when effective, will restrict its efficiency if it only provides

basic data.

III.3.1. Stomach contents

Analysis of the stomach contents allows the species' diets to be described, and the ecological niche in which they evolve to be determined. It also permits the ways of parasitic and toxicological contamination to be assessed.

They must be kept at -20°C to be identified in the laboratory. Alternatively, 70% alcohol can be used to preserve the stomach contents. Use of formalin should be avoided. Formalin attacks the skeletons of bony fishes. Beforehand, all the unattached parasites must be extracted.

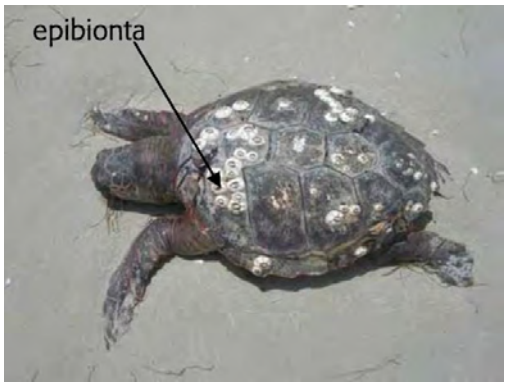
III.3.2.Genetic studies

Fragments of tissue of about 1 cubic centimetre are removed, immediately frozen and kept at -30/-80°C or fixed in 70% alcohol or in a 20% dimethyl sulphoxide (DMSO) solution saturated with NaCl.

III.3.3. Studies of epibionta

A great number of epibionta attach themselves to marine turtles, especially *Caretta caretta* (L.) (Dodd,1988). These organisms and their relationship with their hosts could reveal biogeographical differences and provide interesting ecological information.

In the case of : ***cirripedia***, The epibionta are carefully removed from the live or dead stranded turtles and then fixed and conserved in 70% ethanol for them to be determined and counted in the laboratory.



III.3.4. Determining the sex ratio

The sex ratio is a very important parameter in population dynamics studies. That of newly born animals could be very easily accessed on the egg-laying beaches, directly by sampling newly born turtles or indirectly by monitoring the temperature of the nests/sand or the period of incubation.

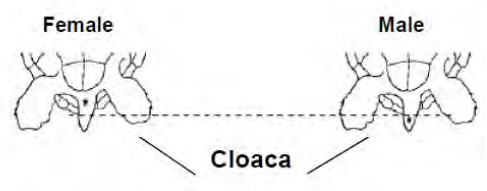
For juveniles, since these do not present external sexual dimorphism, the sex ratio can be

directly assessed by observing the gonads (necropsy or laparoscopy) or indirectly by using hormonal levels. Adults' sex ratio can be assessed by external observation. In fact, they present sexual dimorphism.

Monitoring strandings could make an enormous contribution to the knowledge of this parameter for juveniles and adults, especially since the latter are very rare.

Adult *Caretta caretta* loggerheads (the most commonly found in the Mediterranean) are over 75 cm. long on the LCC (curved shell length). According to the Casale *et al*. (2005) method, sexing stranded turtles is done in the following way:

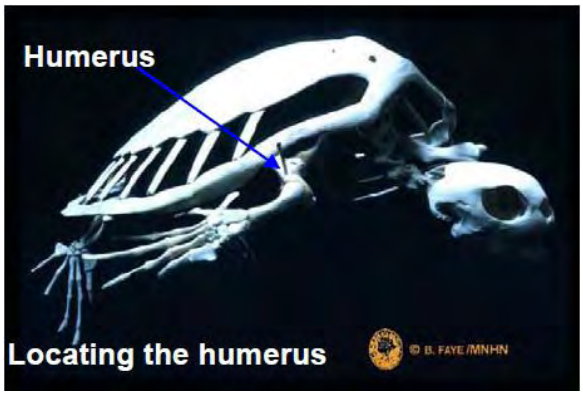
- turn the turtle upside down, with its back against the soil
- align the tail along the body axis
- check the position of the cloaca compared to the hind edge of the shell. The turtle is female if the cloaca is inside this, male if it is outside this (see the sketch below).



III.3.5. Determining age

Estimating the age and biological parameters associated with this (age at sexual maturity, growth, longevity, etc.) is vital for demographic studies of natural populations. Skeleto-chronology is a credible way of determining the age of turtles. Its principle is based on the counting of skeletal growth marks annually recorded on different bony structures of poikilothermic animals like turtles, whose rhythm of growth is interrupted or discontinuous. These interruptions of growth are expressed by stria showing a halt in growth on certain parts of the skeleton.

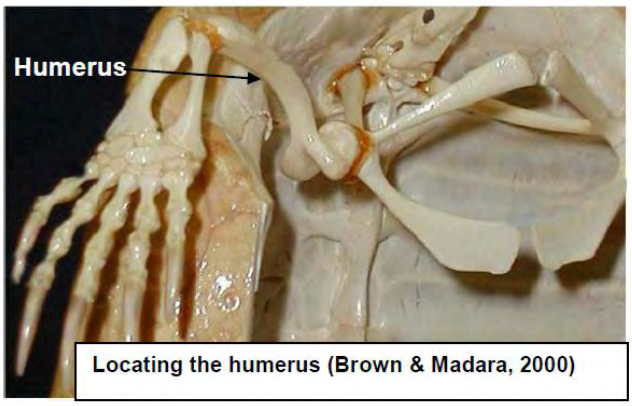
In the case of marine turtles, the humerus is used for this, and can easily be recuperated from dead stranded turtles, avoiding any sacrifice of these threatened species.



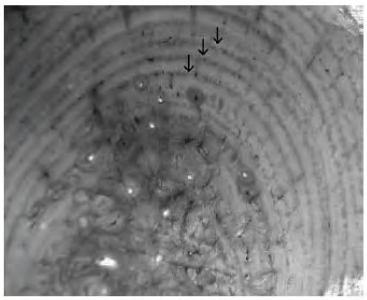
Recuperating and preparing the humerus to read the growth halt stria require the following stages (Snover, 2002):

1. Dissecting the dead turtle and recuperating the humerus
2. Cleaning it, boiling it and then drying it outdoors for about 2 weeks
3. Cutting a section of part of the humerus, about 2-3 mm., using an appropriate microtome
4. Fixing the section by (10%) formalin to make the bone harder during decalcification and cutting
5. Decalcifying the section by a decalcifying agent. The decalcification time depends on the size of the bone (humerus) and the power of the decalcification solution (12-36 hours). The aim of decalcification is to eliminate as much of the calcium as possible to get a better view of the growth halt stria
6. Making the section thinner by using a freezing microtome (the section thus obtained will be about 25µm)
7. Adding a solution of haematoxylin diluted in distilled water (1:1) to be able to see the growth halt stria
8. Mounting the section in (100%) glycerine for reading under a low power stereo microscope

It should moreover be said that this age study must be done by an expert in the subject, but at the level of the strandings network the basic thing is to collect samples and data for the scientific community especially since the material (humerus) can be kept for a long time.



Locating the humerus (Brown & Madara, 2000)


Growth halts stria on a humerus cross-section

III.3.6. Toxicology

Samples taken according to standardised protocols of various animal organs allow contaminants to be classified and measured. There are many contaminants – heavy metals (cadmium, mercury, lead, etc.), POPs (persistent organic pollutants (PCB and its like, pesticides, etc.)), dioxins, etc. The aim is to determine the relationship between the toxicity of certain human-origin pollutants and these predators that are high in the trophic chain. The samples must either be sent quickly to the laboratory or frozen at -20°C. A minimum sample of 10 g of tissue (muscle, liver, kidney) should be taken.

The tissue must be cut with a plastic knife and placed in a plastic bag; any metal is to be avoided.

III.3.7. Microbiology

The samples should be taken in sterile conditions from lesions (using the sterile Pasteur pipette or the sterile bud) from very fresh animals kept at 4°C to be sent quickly to the concerned laboratory. If they are not analysed in time, the samples must be frozen at -20°C for bacteriology

and at -80°C for virology.

III.3.8. Parasitology

Unattached parasites are fixed in a 10% formalin solution or in a solution of 70% alcohol with 5% glycerine. Tissues with parasites and parasitic cysts must be refrigerated at +4°C and sent to the laboratory within the space of the following 24 hours to be identified; if not, they must be frozen at -20°C.

III.3.9. Histopathology

Tissues from the organs (stomach, intestine, liver, heart, kidney) must be fixed in a 10% formalin solution (preferably buffered at pH 5). Thin tissue cuts must be made (maximum 1 cm thick); one must make sure that the volume of the fixative is at least 10 times the volume of the tissue. In the case where there is a lesion, fix a piece of healthy tissue and another of the affected tissue.

III.4. Eliminating the carcass

For reasons of health and cleanliness of beaches, the carcass should be eliminated either by incineration (to be avoided on the beach for public health reasons) or by burial. But it is advisable to mark the carcass in any case with paint, for example, to show that it has been examined.

The shell or skeleton could be recuperated to be put in a museum or for teaching purposes.

IV. EXTENDING THE TURTLE NETWORK TO OTHER SYSTEMATIC GROUPS

The network could concern other systematic groups: cetaceans, sharks and seabirds. Also, other existing networks, like those for cetaceans, could be extended to handle turtles. Indeed, actors in the field could easily report strandings of big vertebrates. The means implemented and the precautions to be taken during the various samplings, the fixatives and storing techniques are pretty much the same. Marine turtles, cetaceans and sharks could be targeted by a national strandings network.

IV.1. Cetaceans

For cetaceans, see the guidelines for developing national networks for monitoring cetacean strandings crafted by ACCOBAMS. Other guidelines could be useful in this context, e.g.:
• guidelines for setting up a tissue bank system with ACCOBAMS
• guidelines for returning cetaceans to the natural environment
All these documents can be downloaded from the ACCOBAMS site http://www.accobams.org/

VI.2. Elasmobranchs

The system for signalling strandings, the *in situ* action team, and the necessary means are practically the same as for other groups of animals. However, the team involved must include people with knowledge of this systematic group. The main data and samples to be considered

when faced with a stranded elasmobranch appear in the file in Annex 7.

As with the other systematic groups, the main aim of a strandings network would be to provide scientists with as much information and as many samples as possible, to develop knowledge on the conservation biology of these, mostly threatened, species.

The strandings network to be developed could restrict itself to some chondrichthyans that are already protected on a regional scale in the context of the Barcelona Convention: mainly the great white shark (*Carcharodon carcharias*), the basking shark (*Cetorhinus maximus*) and the Mediterranean giant Manta ray (*Mobula mobular*) (Annex 8).

Other chondrichthyans also deserve to be monitored and are considered as priority species in the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea; they are listed on the IUCN's Red List, in the Annexes to the Berne and Bonn Conventions, and some have been listed in the CITES Annexes.

These priority species are: the sawfishes *Pristis* spp. (considered as "in critical danger of extinction" (CR) by the IUCN's Red List), the bull-shark *Carcharias taurus*, the tiger shark *Odontaspis ferox* (considered as "in critical danger of extinction" (CR) at Mediterranean level by the IUCN), and the grey pochetau *Dipturus batis* (considered as "endangered" (EN) at Mediterranean level by the IUCN).

The information and measurements to be done in the presence of a shark would be the subject of a file (Annex 7) inspired by that crafted by the MEDLEM programme.

Taking samples of parts of the body and organs is also to be anticipated for possible studies of the biology and health of sharks. The main samples and way of conserving them appear in Table 1below:
Samples to be taken and conservation method (Source: MEDLEM programme)

Samples to be taken and conservation method (Source: MEDLEM programme)

	Yes1	No	Alcohol 70%	formalin4%	Freezer	Bouin
Contents of stomach			***	*	*	
Contents of intestines			***	*	*	
Gonads				***		
Muscle			***		*	
Liver				***		
Gills and branchiospines2				***		
Eye						***
Vertebra					***	
Skin				***		
Subcutaneous fat				***		
Spermatophors				***		
Parasites			***	***		
Embryos in the uterus					***	
Uterus				***		

*** Recommended method * Alternative method

1: Yes/No – You take samples or not
2: To conserve the gills and branchiospines, it is recommended to inject 10% formalin (formalin and seawater) for a period of 12-24 hours, and then store the sample after rinsing with water in 80% alcohol

The tissue bank to be set up as part of the strandings studies would be common for all these vertebrates studied.

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Annex IX - Draft Guidelines for reinforcing laws and regulations for the Conservation and Management of Cartilaginous Fish

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EXECUTIVE SUMMARY

The Guidelines aim to promote implementation of the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean, approved by Contracting Parties to the Barcelona Convention in 2003. They provide technical guidance on designing national legislation and regulations, taking account of global and regional instruments applicable to the Mediterranean and relevant policy positions on shark conservation and management.

Technical information was obtained through direct contact with members of the IUCN Shark Specialist Group and specialists at the UN Food and Agriculture Organisation, the General Fisheries Council for the Mediterranean and the International Commission for the Conservation of Atlantic Tunas. Answers received indicated that sharks have long been a relatively low priority for regional fisheries management in the Mediterranean. Catch volumes and values (excepting fins) are considered low in the absence of adequate data and species of greater economic value have received higher management priority.

Annexes A and B summarise key provisions of international and regional instruments relevant to marine biodiversity conservation and fisheries, highlighting recent developments that support stronger protective and management action for sharks. Annex C lists the 2007 IUCN Red List assessment of the conservation status of chondrichthyans in the Mediterranean, together with the current international legal status of each species.

Information on national implementation was obtained through a questionnaire to the RAC/SPA focal points of the 22 Contracting Parties. Fourteen responses were received (i.e. 64%). The replies revealed significant differences and major gaps in all aspects of national implementation (species protection, data collation, habitat conservation, monitoring and awareness-building: see further Annex D).

The Guidelines consist of four sections:

1. Part 1 sets out general steps to review and improve legislation consistent with the ecosystem and precautionary approaches;
2. Part 2 covers strengthening of institutional and management frameworks through improved coordination, cooperation with international organisations and stakeholders, public awareness and expanding research, data collection and monitoring;
3. Part 3 provides guidance on legal measures to protect threatened species, regulate trade, manage fishing effort, control shark finning, manage recreational fisheries and enforce controls on illegal, unregulated and unreported fishing;
4. Part 4 covers legal measures to conserve critical habitats, establish marine protected areas and support the integrated management of marine and coastal ecosystems.

For the purposes of this document and in line with UN-FAO practice, the term „shark' is taken to include all species of sharks, skates, rays and chimaeras (Class Chondrichthyes).

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ABBREVIATIONS

Barcelona Protocol	Barcelona Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (concluded under the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, 10 June 1995)
Bern Convention	Convention on the Conservation of European Wildlife and Natural Habitats
Chondrichthyan Action Plan	Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea (UNEP-MAP RAC/SPA 2003)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species (Bonn Convention)
Code	UN-FAO Code of Conduct for Responsible Fisheries (1995)
COFI	UN-FAO Committee on Fisheries
COP	Conference of the Parties
CR	Critically Endangered (IUCN Red List of Threatened Species)
DD	Data Deficient (IUCN Red List of Threatened Species)
EAF	Ecosystem Approach to Fisheries
EEZ	Exclusive Economic Zone
EN	Endangered (IUCN Red List of Threatened Species)
FSA	United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks
GFCM	General Fisheries Commission for the Mediterranean
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICZM Protocol	Protocol on Integrated Coastal Zone Management in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, signed on 21 January 2008 (not yet in force)
IPOA-Sharks	International Plan of Action for the Conservation and Management of Sharks
IUCN	World Conservation Union
IUCN Red List 2007	Red List assessment of Mediterranean chondrichthyans, published in Cavanagh, R. and Gibson, C. 2007. *Overview of the Conservation Status of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea.* IUCN 2007
LC	Least Concern (IUCN Red List of Threatened Species
MEDITS	International bottom trawl survey in the Mediterranean
MEDLEM	Mediterranean Large Elasmobranchs Monitoring programme
MPA	Marine protected area
NGO	Non-governmental organisation
NT	Near Threatened (IUCN Red List of Threatened Species)
RAC/SPA	UNEP/MAP Regional Activity Centre for Specially Protected Areas, responsible for implementation of the Barcelona Protocol
RFMO	Regional Fisheries Management Organisation
SCRS	ICCAT Standing Committee for Research and Statistics
shark	Term used to cover all species of sharks, skates, rays and chimaeras (Class Chondrichthyes) covered by the RAC/SPA Chondrichthyan Action Plan
Shark Plan	National Plan of Action for the Conservation and Management of Sharks
TAC	Total Allowable Catch
UNCLOS	United Nations Convention on the Law of the Sea
UN-FAO	Food and Agriculture Organization of the United Nations
VU	Vulnerable (IUCN Red List of Threatened Species)

INTRODUCTION: PURPOSE OF THESE GUIDELINES

These Guidelines were developed at the request of the RAC/SPA Secretariat to promote implementation of the *Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean*, approved at the XIII Conference of Contracting Parties to the Barcelona Convention in Catania, Sicily in November 2003.

They provide technical guidance for the design of national legislation and regulations for cartilaginous fish conservation and management and take account of global and regional instruments applicable to the Mediterranean as well as relevant international policy positions on the issue.

The Guidelines build on the 2007 IUCN Red List assessment of the conservation status of cartilaginous fishes (chondrichthyans) in the Mediterranean[1]. This assessment covered 71 species known to occur and breed within the Mediterranean Sea[2] and placed them in the following categories[3]:

- 42% (30 species) are considered threatened within the region. Of these, 18% (13 species) are Critically Endangered (CR), 11% (8 species) are Endangered (EN) and 13% (9 species) are Vulnerable (VU). Most of these species are considered to be more seriously threatened within the Mediterranean region than at the global level;

- 18% (13 species) are assessed as Near Threatened (NT), reflecting concern that they are close to qualifying for a threatened category or would be threatened were it not for ongoing conservation programmes;

- 14% (10 species) are assessed as Least Concern (LC) and are not considered to be under any threat of extinction now or in the foreseeable future;

- 26% (18 species) are assessed as Data Deficient (DD). This means that there is not enough information to enable accurate assessment of their extinction risk (lack of research, rarity of species, limited geographic distribution). It does not signify that these species are not threatened. As knowledge improves, such species are often found to be highly vulnerable to anthropogenic threats, in particular over-exploitation.

Several factors contribute to the decline of chondrichthyans in the Mediterranean.

The first group of factors relate to their life history. Chondrichthyans are particularly vulnerable to over-exploitation because they have low rates of potential population increase and are: slow growing; late to mature; have low fecundity; long gestation periods; high natural survivorship of all age classes; and long life.

The second group of factors are manmade and are aggravated by the semi-enclosed nature of the Mediterranean Sea (see Figure 1). They include:

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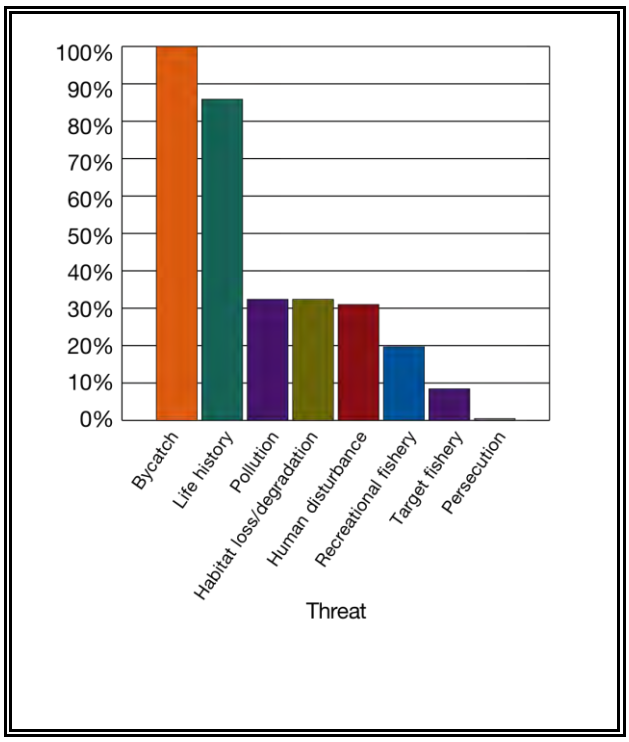
[1] The IUCN Red List 2007 assessment is published in Cavanagh, Rachel D. and Gibson, Claudine. 2007. *Overview of the Conservation Status of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea*. IUCN. This publication provides detailed scientific information and data that will be helpful to users of these Guidelines.

[2] The occurrence of a further nine species was found to be either infrequent, questionable, or could not be confirmed due to taxonomic uncertainty.

[3] The IUCN Red List of Threatened Species Categories and Criteria are applied to individual species assessments to determine their relative threat of extinction. Classification of species into the threatened categories (CR, EN, VU) is through a set of five quantitative criteria based on biological factors related to extinction risk, including: rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation.

- intensification of fishing activity throughout its coastal and pelagic waters, with all shark species adversely affected by bycatch;
- changes in predator/prey abundance due to fisheries interactions;
- boat strike;
- entanglement in marine debris and fishing gear;
- habitat loss or modification, compounded to a certain extent by climate change;
- environmental degradation; and
- pollution.

Figure 1 Percentage of chondrichthyan species susceptible to major threats in the Mediterranean



Source: Cavanagh and Gibson, 2007

Taken together, these factors mean that some species of chondrichthyans will be very slow to recover from overfishing, pollution or habitat destruction and may not recover if even low levels of exploitation continue.

The decline in chondrichthyan populations matters for reasons that go well beyond biodiversity conservation. As top (apex) predators, they play a key role in keeping marine ecosystems in balance. Their eradication or decline can lead to associated declines in the health or abundance of prey/competitor populations. This can have negative economic impacts and adverse consequences for future food security and commercial and recreational options.

International legal frameworks were slow to respond to scientific concern over declining stocks. The earliest concrete measures for shark conservation and management were adopted in the early 1990s, under the Convention on International Trade in Endangered

Species of Wild Fauna and Flora (CITES)[4]. These were followed by decisions adopted by regional fisheries management organisations (RFMOs) and in 1999, by the voluntary International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), developed by the United Nations Food and Agriculture Organization (UN-FAO) (see Appendix A and B).

Despite international efforts to protect a small number of shark species and limit negative fishery impacts, existing management programmes are still inadequate to ensure the long-term survival of many species and/or populations. Poor implementation of conservation and management measures has regularly been highlighted in UN General Assembly resolutions on sustainable fisheries, most recently in December 2008[5]. National and regional application of IPOA-Sharks remains poor despite vigorous encouragement from relevant international organisations.

Fisheries taking sharks (in directed catches or as bycatch) have long been a relatively low priority for fisheries management because catch volumes and values (with the exception of fins) are generally considered as low and species of greater economic value have received higher management priority. This position is gradually changing as shark conservation attracts increasing concern, but the effectiveness of action is seriously hampered by gaps in the data needed to make stock assessments. Full implementation of these Guidelines will require stronger compliance with regional data collection and reporting requirements for sharks.

Strong action at the national level on conservation, management and data collection is critical to make existing legal instruments work more effectively and to guide the development of new and stronger policies and standards. At present, however, implementation of relevant measures by Mediterranean States is extremely uneven.

These Guidelines take a broad approach that considers all sectors, stakeholders and types of activity that may affect sharks. They provide a practical framework to help Mediterranean States to strengthen their legal and institutional frameworks, improve conservation and management measures adapted to the needs of different species and promote more integrated approaches to marine ecosystem management.

1 DEVELOP APPROPRIATE LEGAL FRAMEWORKS

An integrated approach that addresses species conservation, sustainable fisheries management and broader environmental concerns is needed to ensure the long-term survival of many shark species or populations in the Mediterranean.

International commitments for conservation and management of marine resources can only be made operational if they are transposed into national legislation and regulations. For the Mediterranean, action at the national level is required or recommended under:

- the Barcelona Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, CITES, the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the United Nations Convention on the Law of the Sea (UNCLOS);

[4] Resolution Conf. 9.17 „The Status of International Trade in Shark Species'.

[5] United Nations General Assembly Resolution (63-112 of 5 December 2008).

- the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea (Chondrichthyan Action Plan), which contributes to regional implementation of IPOA-Sharks;

- fisheries conservation and management recommendations and requirements developed by the UN-FAO, RFMOs and/or the European Community.

Existing legal frameworks in most Mediterranean countries lag behind the provisions laid down by these instruments. Progress depends on political will as well as concerted action by legislators and managers.

Shark species already listed for special protection under certain instruments are still declining without appropriate management and are now in urgent need of recovery measures. In parallel, the conservation status of several other shark species in the Mediterranean has worsened. Broad-based frameworks at national level are needed to address new as well as existing priorities.

Whether national measures should be legislative or regulatory will depend on each country's legal system. Certain matters usually have to be dealt with by primary legislation (e.g. ratification of treaties, allocation of ministerial responsibilities, establishment of offences and penalties). More detailed requirements and technical standards (e.g. changes to fisheries quotas or gear requirements, modification of protected species lists) can usually be issued through secondary or subsidiary regulations issued directly by the relevant ministry without the need to go through Parliamentary procedures.

Several Mediterranean States have decentralised systems of government where certain responsibilities are carried by subnational/local administrations. References to „national' in these Guidelines includes subnational administrations where applicable.

1.1 Review existing measures to identify gaps and weaknesses

In most countries, many sectoral laws and regulations are relevant to shark conservation and management and the wider marine and coastal environment. These instruments have often evolved in a piecemeal way. A common problem relates to inter-sectoral policy gaps or inconsistencies, especially in countries that have not developed a coordinated marine or coastal strategy.

Reviewing and streamlining national tools and institutional arrangements can thus have benefits for marine resource management going well beyond sharks.

Fisheries legislation is critical because it provides the basis to adopt technical regulations to address directed fisheries and to minimise bycatch. However, older fisheries laws may have a relatively narrow focus and not provide a legal basis for conservation of non-target species or regulation of non-fisheries activities that impact the marine environment. The competent fisheries authority will have a clear mandate to work with RFMOs but this may not explicitly cover conservation of marine biodiversity e.g. threatened species and critical habitats.

Species/habitat protection provisions may be located in nature conservation legislation which is implemented by the environment ministry or equivalent. However, this type of ministry may not have powers extending out to sea which obviously limits its capacity to implement commitments for conservation of marine species and habitats.

Modern biodiversity legislation may bridge the land-sea divide and provide a broader legal basis for key actions such as management and recovery plans for threatened species

(including migratory species), protection of critical habitats and even the establishment of marine protected areas. Comprehensive laws of this kind can provide a unified framework for marine biodiversity conservation consistent with the Barcelona Protocol. However, their implementation will still need to be coordinated with fisheries regulations.

Non-fisheries activities that impact the marine environment, such as shipping, oil and gas exploitation, coastal development, industry and tourism will often be regulated by separate laws which also need to be taken into account.

1.1.a An inventory should be prepared of relevant laws, regulations, and institutional and funding measures. States that have already carried out national environmental or fisheries strategic planning can build on such initiatives to avoid duplication.

1.1.b Specific sectors to cover include fisheries, marine species and habitat conservation, species trade controls, research, monitoring and data collection programmes and other programmes and activities that affect marine environmental quality.

1.1.c The review team should aim to assess how far the existing national framework conforms to the rules and best practices laid down by the international instruments summarised in Annex A and Annex B, as reflected in these Guidelines.

1.1.d Strengths and weaknesses identified in the course of a review could include:

⇒ Strengths: measures, information systems and funding already in place to implement international commitments and respond to emerging conservation priorities; clear allocation of administrative roles and responsibilities; regular communication between different departments; well-informed and motivated managers; communication in place with commercial fishery and other stakeholders; capacity and resources available for research, monitoring and enforcement;

⇒ Weaknesses and inconsistencies: partial or non-existent implementation of international obligations; inadequate data to underpin management measures; poorly coordinated marine governance; inadequate training, capacity and resources to support managers; perverse incentives (e.g. subsidies, grants) that could support over-fishing or use of non-selective fishing gear; weak compliance and enforcement procedures.

1.1.e Based on this assessment, practical proposals can be developed to phase out conflicting or outdated measures and to strengthen the national framework. The most appropriate way forward will vary depending on a State's legal system, existing measures and capacity for implementation. Options include one or more of the following:

⇒ leaving primary legislation unchanged but improving cross-sectoral coordination, data collection and funding;
⇒ adjusting regulations under fisheries legislation to manage directed fisheries and bycatch on a more sustainable basis and improve compliance procedures;
⇒ coordinating the implementation of fisheries and environmental legislation to ensure that species and habitat conservation and non-fisheries marine activities are systematically considered, including in the development of plans, programmes and policies affecting the coastal and marine environment;

⇒ creating or amending primary legislation to create an integrated framework for marine biodiversity conservation (see Box 1). This may require an extension of the mandate of the competent authority.

Box 1 Example of fisheries legislation that integrates marine biodiversity conservation

New South Wales (Australia): Fisheries Management Act n°38 of 1994

The Act regulates fisheries and aquaculture and also functions as a nature conservation law for marine ecosystems by establishing provisions to:

(a) conserve biological diversity of fish and marine vegetation and promote ecologically sustainable development and activities;
(b) prevent the extinction and promote the recovery of threatened species, populations and ecological communities of fish and marine vegetation;
(c) protect the critical habitat of those threatened species, populations and ecological communities that are endangered;
(d) eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities of fish and marine vegetation;
(e) ensure that the impact of any action affecting threatened species, populations and ecological communities of fish and marine vegetation is properly assessed; and
(f) encourage the conservation of threatened species, populations and ecological communities of fish and marine vegetation by the adoption of measures involving co-operative management (Article 220A).

Source: http://www.dpi.nsw.gov.au/fisheries

1.2 Define the purpose and scope of legislation

Whatever type of legal framework is in place, all laws and regulations should use clear and precise language to define the scope, requirements and procedures established by law. This is important to avoid ambiguity and facilitate effective implementation, monitoring and enforcement.

1.2.1 Objectives

Clear and broad objectives are needed to guide the development and implementation of legislation and regulations and to make it easier to set management priorities.

1.2.1.a The objective should be to ensure the conservation and management of Mediterranean sharks and their long-term sustainable use, consistent with IPOA-Sharks.

1.2.1.b Every State that contributes to fishing mortality on a Mediterranean species or stock should participate in its management and seek to align its legislation and policies with the detailed objectives laid down in the Chondrichthyan Action Plan (see Box 2).

Box 2 Objectives of the Chondrichthyan Action Plan for the Mediterranean

- general conservation of chondrichthyan populations of the Mediterranean, by supporting and promoting national and regional programmes for sustainable fisheries of commercial stocks either as target or accessory species;
- protection of selected chondrichthyan species, whose populations are considered endangered;
- protection and restoration of critical habitats, such as mating, spawning and nursery grounds;
- improvement of scientific knowledge by research and scientific monitoring, including creation of regional standardised databases;
- recovery of depleted chondrichthyan stocks.

Source : Mediterranean Action Plan for the Conservation of Chondrichthyan Fishes (§10)

1.2.2 Species and fisheries coverage

1.2.2.a Legislation should apply to all Mediterranean sharks, defined to include all species of sharks, skates, rays and chimaeras belonging to the class Chondrichthyes, consistent with IPOA-Sharks and the Chondrichthyan Action Plan.

1.2.2.b National frameworks should:

⇒ apply to all fisheries taking sharks in the Mediterranean, whether as target species or as bycatch, to include commercial, recreational and sport fisheries;
⇒ support conservation and management measures adapted to the needs of transboundary, straddling, highly migratory and high seas shark stocks throughout their range (see Annex B).

1.2.3 Geographic coverage

The legal framework needs to cover waters under national sovereignty or jurisdiction and also the high seas.

This is particularly important in the Mediterranean as relatively few countries have extended the limits of waters under national jurisdiction by declaring an exclusive economic zone or exclusive fisheries zone[6]. A significant proportion of the Mediterranean basin therefore comes under the legal regime applicable to the high sea. In these waters beyond national jurisdiction, the effectiveness of conservation and management measures depends on each State implementing its international commitments consistent with the duty of cooperation laid down by UNCLOS.

1.2.3.a In waters under national sovereignty or jurisdiction, the State's legal framework should cover all fisheries and all other activities affecting marine biodiversity, whether carried out by its own nationals, by vessels flying its own flag or by foreign nationals or vessels.

1.2.3.b In waters beyond national jurisdiction, legislation should apply to activities carried out by a State's nationals and by vessels flying its flag and provide for compliance with

[6] Although the situation is evolving: see Annex B.

fisheries and conservation measures mandated by RFMOs and/or by other competent organisations.[7]

1.2.4 Content of legislation

National frameworks need to provide for a set of shark conservation and management measures and clearly define responsibilities for their implementation and monitoring.

1.2.4.a Relevant legislation should establish a solid legal basis to adopt measures for:

- ⇒ collection and reporting of required data;
- ⇒ protection of vulnerable or threatened shark stocks;
- ⇒ sustainable management of directed shark fisheries;
- ⇒ minimising bycatch of sharks in fisheries targeting other species;
- ⇒ prohibiting/regulating finning and minimising discards from shark catches;
- ⇒ effective tools for monitoring, surveillance and enforcement;
- ⇒ regulation and management of activities and processes that may damage critical habitats and/or the coastal and marine environment.

1.2.4.b The legal framework should define the powers and duties of ministers/agencies responsible for implementing such measures. These should cover:

- ⇒ issuing and updating subsidiary regulations to meet the objectives of the legislation and to implement technical recommendations approved by RFMOs or other competent organisations;
- ⇒ coordination and strengthening of inventories, surveys and reporting procedures to obtain reliable data on shark conservation status, harvesting and trade;
- ⇒ development of management and recovery plans for threatened or over-exploited species;
- ⇒ training and equipment of personnel for compliance and enforcement activities;
- ⇒ stakeholder participation in coastal and marine planning processes and decision-making;
- ⇒ monitoring of implementation to identify constraints and areas for improvement.

1.3 Incorporate key approaches into legislation and regulations

Integrated conservation and management of fisheries resources needs to be consistent with the the ecosystem approach and precautionary principle. These are widely endorsed by relevant international instruments but their practical application in the marine environment remains complex.

1.3.1 Ecosystem approach

The ecosystem approach is based on the application of scientific methodologies focused on levels of biological organisation, which encompass the essential processes, functions and

[7] Under Art.117 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS), all States have the duty to take, or to co-operate with other States in taking, such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas (see Annex B).

interactions among organisms and their environment[8]. At sea, the ecosystem approach seeks to move beyond managing individual species and stocks to a more holistic approach that considers the interdependence of different components of the marine environment and makes allowance for gaps in data (see Box 3).

Box 3 Application of the Ecosystem Approach to Fisheries (EAF)

UN-FAO has developed detailed guidance on EAF, partly in recognition of the poor performance of many current management approaches to fisheries that have led to overfishing, economic waste and adverse impacts on habitat (UN-FAO 2003, UN-FAO 2005).

The purpose of EAF is to plan, develop and manage fisheries in a manner that addresses the multiple needs and desires of societies without jeopardising the options for future generations to benefit from the full range of goods and services provided by marine ecosystems. For this purpose it brings two different management processes together:

- ecosystem management (conserving the structure, diversity and functioning of marine ecosystems through management actions focused on biophysical components of ecosystems); and
- fisheries management (satisfying human needs for food and economic benefit through management actions focused on fishing activity and the target resource).

Source: UN-FAO 2003, available at http://www.fao.org/DOCREP/005/Y4470E/Y4470E00.HTM

The United Nations General Assembly has strongly endorsed this approach and encouraged States to apply EAF by 2010[9]. In the Mediterranean, the Strategic Partnership for the Mediterranean Large Marine Ecosystem[10] supports transition to ecosystem-based management of shared marine systems. Data to support application of the ecosystem approach are available from *inter alia* the UN-FAO and the European Environment Agency, which compiles the results of environmental monitoring in parts of the Mediterranean region.

1.3.1.a Fisheries policy, legislation and management measures should be consistent with the following principles:

- ⇒ fisheries should be managed to limit their ecosystem impact to an acceptable level;
- ⇒ ecological relationships between species should be maintained;
- ⇒ management measures should be compatible across the distribution of the resource;
- ⇒ precaution in decision-making and action is needed because knowledge of ecosystems is incomplete;
- ⇒ governance should ensure both human and ecosystem well-being and equity.

1.3.1.b The role of sharks as apex predators and as important components of a balanced marine ecosystem should be recognised in EAF implementation. Given the vulnerability of Mediterranean chondrichthyans to increasing fishing pressure, directed fisheries and bycatch should both be managed within a framework based on the ecosystem approach (see further Figure 3).

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[8] Principles for applying the ecosystem approach have been defined under the Convention on Biological Diversity (Decision V/6, see http://www.cbd.int).

[9] E.g. UNGA Résolution 62/117 (2007), §93.

[10] Supported by the United Nations Environment Programme (UNEP), the Global Environment Facility and the World Bank (see further http://www.unepmap.org/index.php).

1.3.2 Precautionary principle

The precautionary principle is embedded in many international instruments, including the Barcelona Protocol, the 1995 United Nations Agreement on Straddling and Highly Migratory Fish Stocks, the UN-FAO Code of Conduct for Responsible Fisheries and IPOA-Sharks.

Fisheries managers are required to be cautious when the state of a resource is uncertain (e.g. where fishery data are insufficient or unreliable) and to conduct exploitation at a minimal level. This is particularly important for sharks in the Mediterranean where existing data and stock assessments are generally inadequate and where management measures have so far proved insufficient to rebuild depleted stocks or prevent the decline of others.

The low productivity of sharks in general and the naturally small population size or rarity of some species makes the precautionary approach most applicable to this group of fish. Their stocks can often be rapidly depleted to very low levels and be slow to recover from the effects of overfishing (UN-FAO 2000).

1.3.2.a The absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent species and non-target species or their environment. Existing knowledge of the threats facing Mediterranean sharks is enough to justify rapid implementation of precautionary management measures in relevant fisheries.

1.3.2.b Shark conservation and management strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying precautionary measures consistent with recommendations or guidance developed by competent international organisations. Controls should be implemented early during the developmental phases of fisheries taking shark species.

1.3.2.c Conservation and management measures should be implemented as a priority for critically endangered and endangered species (IUCN Red List 2007), without prejudice to ongoing collection of additional data.

1.3.3.d The precautionary principle should be extended to management measures for data-deficient species.

2 STRENGTHEN INSTITUTIONS AND MANAGEMENT SYSTEMS

2.1 Promote cross-sectoral coordination

The Chondrichthyan Action Plan stresses the importance of cooperative management at national, regional and international levels (§18). Effective governance and partnerships with different resource users are critical to meeting the objectives of legislation.

2.1.a Regular communication is essential between national focal points for conventions and organisations concerned with fisheries, marine environmental management and non-fisheries uses of the sea, particularly in advance of multilateral policy negotiations and reviews.

2.1.b Competent personnel should be required to cooperate with their counterparts in other Mediterranean States, RFMOs and relevant international organisations on information

exchange, research and coordinated management measures, particularly for transboundary, straddling, highly migratory and high seas stocks.

2.1.c Cross-sectoral coordination is critical to ensure consistency of national policies and programmes for management of the marine environment and resources. Coordination between fisheries, environmental, coastal and other concerned departments can be promoted through a range of mechanisms, from an informal cross-sectoral committee to a dedicated marine agency.

2.1.d In parallel, stakeholder partnerships and/or co-management structures may be established to bring together the fisheries sectors, public policy-makers, scientists, external funding bodies, local communities and non-governmental organisations (NGOs). Training may be needed to enable some stakeholders to participate in these processes.

2.1.e Coordination between national and subnational administrations may need to be strengthened in certain States. In addition, local government bodies play a key role in planning and oversight of certain activities that affect the quality of coastal waters and ecosystems. States should ensure that local decision-making powers are exercised consistently with national legislation and its international commitments.

2.2 Cooperate more closely with relevant international organisations

The Mediterranean is exceptionally well equipped with regional agreements and governance frameworks. In practice, however, improving the conservation status of sharks depends on the readiness of each riparian State to agree to and actually implement appropriate management measures and to provide the necessary resources for this purpose.

2.2.a All States should actively contribute to the work of conservation conventions (CITES, CMS, Barcelona Protocol: see Annex A), RFMOs and the UN-FAO (see Annex B) and support improved dialogue between relevant organisations on shark conservation, management and trade.

2.2.b States should promote and support the listing of additional threatened shark species under relevant agreements, taking account of the IUCN Red List 2007 threat assessments, where the long-term protection and management of such species requires stronger international cooperation (see also Guideline 3.1.1).

2.2.c States should encourage RFMOs and the fisheries industry to give higher priority to shark conservation and sustainable management in the Mediterranean through:

- ⇒ development and implementation of a Regional Shark Plan, based on the best available scientific information through *inter alia* limits on catch or fishing effort[11];
- ⇒ application of the ecosystem approach and precautionary principle to fisheries management within the remit of relevant RFMOs;
- ⇒ expansion of shark stock assessments at the regional level;
- ⇒ stronger data collection requirements with clearer coverage of bycatch.

11 Consistent with UNGA 63/112 (2008), §13.

2.3 Engage and build awareness amongst stakeholders

2.3.a Stakeholder support is essential for conservation and management measures to be accepted. Representatives of fisheries sectors, affected communities, NGOs and other interested parties should be consulted during the process of strengthening national frameworks. Information on relevant regulations and permits issued should be publicly accessible.

2.3.b Information materials targeted at stakeholders directly engaged with fisheries taking sharks (commercial fishing sector, recreational anglers, associated industries) should be developed with the technical support of specialist organisations and/or NGOs and widely disseminated. These could include species identification guides and best practice on the safe handling and release of sharks.

2.3.c Public awareness campaigns should be developed for other groups of stakeholders, including administrative authorities, the general public and tourists, to address the role of sharks in the balance of marine ecosystems and the threats they face.

2.3.d Guidelines for shark watching should be published and widely distributed to anglers, yachtsmen, divers and other interested groups to promote responsible practices at sea, minimise disturbance to sharks and engage such groups in conservation (see Box 4).

Box 4 Basking Shark Code of Conduct, United Kingdom

Control near Basking Sharks

- Restrict your speed to below 6 knots and avoid sudden speed changes.
- Do not approach closer than 100m.
- When closer than 100m switch the engine to neutral to avoid injuring sharks.
- Avoid disturbing dense groups of sharks as you may disrupt courtship behaviour.
- Do not approach areas where basking sharks have been observed breaching.
- Jet-skis are incompatible with basking sharks and should stay at least 500m away.
- For every shark visible on the surface there are likely to be more hidden just below.

Tips

- Take time to observe the direction of movement of the basking sharks then quietly position the vessel alongside their anticipated course for a safe and enjoyable view.
- If you find basking sharks close to your vessel switch your engine to neutral, remain calm and quiet and enjoy a close view of these magnificent animals until they move away. Don't forget to take photographs!

It is not advisable to swim with basking sharks, both for your safety and for the safety of the sharks. If you do decide to enter the water please take note of the following precautions:

- Do not try to touch the sharks.
- Maintain a distance of greater than 4m from each basking shark and be wary of the tail.
- Groups of swimmers must stay together and ideally remain at the surface.
- Avoid entering the water if visibility is less than 4m.
- Restrict the numbers of swimmers in the water at any time to 4.
- Avoid flash photography as this can scare the sharks.
- Do not use underwater-propelled devices.

A training and accreditation scheme for operators of registered passenger and charter vessels who agree to comply with this Code of Conduct has been established: approved operators may use the WiSe scheme logo on boats and brochures (http://www.wisescheme.org/).

Source: http://www.baskingsharks.org/

2.4 Expand research, data collection and monitoring

Good data on shark catches and trade are essential to inform stock assessment and monitoring and the development of science-based management decisions. International cooperation is particularly important in this area because many species of sharks have wide-ranging distribution and/or are migratory[12]. Despite this, compliance with existing RFMO data requirements is still considered grossly inadequate, especially for bycatch which is rarely incorporated into national and international fishery statistics[13].

The IUCN Red List 2007 provides a baseline for measuring and monitoring changes in the conservation status of many shark species. However, several species in the Mediterranean are considered data-deficient with inadequate information to assess possible extinction risk[14].

Competent national authorities departments may also refer to information collected by scientific campaigns such as MEDITS (International bottom trawl survey in the Mediterranean[15]) to facilitate stock assessment for a particular species. MEDITS is an EU-supported programme for coordinated evaluation of demersal resources, including cartilaginous fishes (see Box 5).

2.4.1 Research and capacity-building

2.4.1.a National frameworks should support the establishment and funding of research and monitoring programmes, in collaboration with other States and competent organisations as appropriate, covering the following issues:

- ⇒ research into data-deficient species and threatened species, with particular regard to reproduction and growth parameters;
- ⇒ improved stock assessments of shark populations subject to target fisheries and/or bycatch to determine sustainable catch levels and identify appropriate management measures (see 3.3);
- ⇒ possible modification of fishing gear and practices to minimise bycatch[16] (see 3.4);
- ⇒ fishing methods that maximise the likelihood of survival of captured sharks after release;
- ⇒ methods for releasing sharks from fishing gear that minimise risk of injury to fishing vessel operators and crews.

2.4.1.b As part of regional cooperation, States should promote the sharing and use of research results as a basis for setting management objectives, biological reference

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[12] See UNGA Resolution 62-177 (2007), reiterated in Resolution 63-112 (2008) and for more technical detail, UN-FAO 2000 (Part 5, Fishery Management Data and Research).

[13] See e.g. Hurry et al (2008).

[14] NB Three Mediterranean species formerly classified as DD were respectively assessed as EN (*Rhinobatos* spp), VU (*Sphyrna zygaena*) and NT (*Raja polystigma*) by the IUCN Red List 2007.

[15] This European programme, launched in 1992, now reaches from the Alboran Sea to the Aegea, covering depths from 10 to 800m. Nine riparian States are participating in the programme: France, Spain, Italy, Greece, Slovenia, Croatia, Albania, Malta et Cyprus.

[16] In the context of multi-species fisheries activities that characterise the Mediterranean basin, bycatch levels associated with local fisheries can be significant and of commercial importance.

points, sustainability indicators, acceptable risk levels, time frames and performance criteria and for ensuring adequate linkages between applied research and fisheries management.

2.4.1.c States should strengthen capacity for effective implementation by developing training programmes for specialists, fisheries officers and managers in the study and conservation of sharks, giving priority to taxonomy, conservation biology and techniques for data collection, analysis and monitoring.

2.4.2 Species identification and labelling

The species composition of the catch (bycatch or directed fisheries) needs to be determined to feed accurate data into stock assessment, monitoring and management programmes.

This is often complicated for sharks because of taxonomic uncertainties associated with many species and because fish are often processed at sea (e.g. by removal of fins, tails and head). On the other hand, it is impractical to require fishers to land sharks whole as they should be gutted and gilled as soon as practicable after capture to avoid degrading the quality of the meat and other products (UN-FAO 2001).

2.4.2.a. States should work with fisheries stakeholders to facilitate species identification by:

- ⇒ promoting use of field guides that illustrate whole animals, carcasses and body parts (fins, skin, vertebrae, head)[17];
- ⇒ publishing identification sheets in appropriate languages that include the common names of species and disseminating them widely within the fishing industry.

2.4.2.b To enable species-specific landings records to be made (species, sex, partial length of the shark), regulations may provide for sharks to be headed, gilled and gutted at sea to ensure catch quality but should require carcasses to be landed ashore with fins, skin, claspers and, where applicable, dorsal spines attached. The landing of chondrichthyan parts without the accompanying carcasses should be prohibited (see also Guideline 3.5 on finning).

2.4.2.c To ensure species accuracy in trade data, States should use their commodity codes, where they exist, for traded fish products in order to differentiate between fresh/chilled, frozen and dried, processed and unprocessed, shark meat, oil, skin, cartilage and fin products, imports, exports and re-exports. This requirement should apply to all traded shark products, whether from CITES-listed or non-listed species[18] (see Guideline 3.2).

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[17] E.g. Serena 2005, *Field Identification Guide to the Sharks and Rays of the Mediterranean and Black Sea* (http://www.fao.org/fishery/publications).

[18] CITES Decision 14.104 (http://www.cites.org/eng/dec/valid14/14_101-117.shtml).

2.4.3 Reporting of catch and landing data

2.4.3.a Legislation should mandate collection of species-specific data on total catch, to include landings, discards at sea, bycatch (whether discarded or retained) and transhipment of sharks at sea[19].

2.4.3.b The issue or renewal of a fisheries licence should be subject to compliance with data collection regulations and procedures.

2.4.3.c Regulations should use the existing species-specific UN-FAO catch data recording fields for the reporting of shark catches and discards, and work within UN-FAO to amend these, if required, to achieve a more accurate picture of shark mortality through fishing[20]. Such data includes:

- ⇒ location and date of catch;
- ⇒ species composition of the catch (broken down if possible by sex and length of shark);
- ⇒ retained catch by species in number and weight;
- ⇒ discarded catch in number and weight (+ reasons for discard);
- ⇒ product form (whole, headed, gutted, fillets, fins);
- ⇒ gear and vessel specifications and cruise characteristics;
- ⇒ trade and market values.

2.4.3.d Data collection methods[21] may include:

- ⇒ fishing registration data on vessels, companies, gear, licences, operators and fish processing and marketing companies;
- ⇒ resource-user reporting (forms, logbooks, landings declarations);
- ⇒ market transaction records (invoices, sales slips, sales tallies).

2.4.3.e Monitoring programmes should be set up to ensure that catches are evaluated in the right way and verify catch and landing data. These could include:

- ⇒ observers at landing sites, processing plants and markets;
- ⇒ on-board observation programmes to gather precise data on fisheries and on species biology, including sightings and bycatch.

2.4.3.f To facilitate monitoring and compliance, States may consider restricting the landing of sharks to specified harbours which should be named in applicable regulations.

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[19] e.g. ICCAT Resolution 2003-10 mandates improved data reporting on catch, effort by gear type, discards of sharks, landings and trade in shark products

[20] CITES Decision 14.105 (http://www.cites.org/eng/dec/valid14/14_101-117.shtml).

[21] For more detail, see §5.7, UN-FAO 2001.

Box 5 Data collection and monitoring in Malta

The Malta Centre for Fisheries Science (Veterinary Affairs and Fisheries Division) conducts two data collection programmes/surveys related to catches and landings.

The MEDITS Trawl Survey for demersal species involves the collection of data through planned trawls in Maltese waters. Chondrichthyan species recorded are listed by n/km^2, kg/km^2, length, weight, sex and maturity stage (covers *Centrophorus granulosus, Chimaera monstrosa, Dalatias licha, Dasyatis pastinaca, Dipturus oxyrinchus, Etmopterus spinax, Galeus melastomus, Heptranchias perlo, Hexanchus griseus, Leucoraja melitensis, Mustelus asterias Mustelus mustelus, Myliobatis aquila, Oxynotus centrina, Raja circularis, Raja clavata, Raja miraletus, Raja radula, Scyliorhinus canicula, Scyliorhinus stellaris, Squalus blainvillei and Torpedo marmorata*).

The MEDLEM (Mediterranean Large Elasmobranchs Monitoring) programme for large pelagic sharks is carried out on land at the first point of landing at the fishmarket and involves the collection of biological data on species landed (length, weight, sex, maturity stage). It covers *Alopius vulpinus, Centrophorus granulosus, Dasyatis pastinaca, Galeus melastomus, Hexanchus griseus, Lamna nasus, Prionace glauca, Dipturus oxyrinchus, Raja spp., Rostroraja alba, Scyliorhinus canicula, Sphyrna zygaena and Squalus/Mustelus spp*.

Data is also collected for species which are commercially exploited and landed at the fishmarket: *Centrophorus granulosus, Galeorhinus galeus, Hexanchus griseus, Hymenocephalus italicus, Lamna nasus, Prionace glauca, Rostroraja alba, Raja oxyrinchus, Raja spp., Scyliorhinus canicula, Scyliorhinus spp., Sphyrna zygaena, Squalus acanthias and Squatina squatina.* Information on certain species is also available through the Catch Logbook, filled by vessels over 10m in length.
Monitoring and reporting is mandatory for the MEDITS Trawl Survey, Fishmarket Landing Data and the Catch Logbook, but not for MEDLEM.

Source: Malta Environment Protection Directorate

2.5 Adopt and implement a National Plan of Action for chondrichthyans

2.5.a Each State should carry out a regular assessment of the status of shark stocks subject to fishing, in accordance with the UN-FAO Code of Conduct for Responsible Fisheries (6.13), to determine whether it is necessary to develop a National Plan of Action for the Conservation and Management of Shark Stocks (Shark Plan) in accordance with IPOA-Sharks[22].

2.5.b Any State that contributes to fishing mortality on a shark species or stock should participate in its management and, in particular:

- ⇒ adopt a Shark Plan to identify research, monitoring and management needs for shark fishes that occur in waters under its sovereignty or jurisdiction[23];
- ⇒ report on its implementation as part of their biennial reporting to UN-FAO on the Code of Conduct of Responsible Fisheries;
- ⇒ assess its implementation at least once every four years to identify cost-effective strategies to increase its effectiveness.

2.5.c States that determine that a Shark Plan is not necessary should review that decision on a regular basis, taking account of changes in their fisheries, and should in any event compile information on catches, landing and trade.

[22] See further IPOA-Sharks and associated guidance (http://www.fao.org/fishery/ipoa-sharks/2).

[23] This is called for under ICCAT Resolution 2003-10.

3 IMPLEMENT SHARK CONSERVATION AND MANAGEMENT MEASURES

Sustainable management of fish stocks is closely linked with and benefits from the conservation of other marine biodiversity components, particularly high trophic level species.[24]

IPOA-Sharks implementation guidance (UN-FAO 2000) endorses „special protection' or „special management' for species that have particularly low productivity, naturally small populations (rare), a spatially small distribution range, or a distribution range within regions of high anthropogenic impact where they might be threatened or have their populations seriously depleted. It stresses the need to maintain biodiversity through viability of shark populations, bearing in mind that the number of species and within-species genetic variability of shark species is naturally low compared with those of many other taxonomic groups.

Existing fisheries and conservation policies for the Mediterranean have so far proved inadequate to prevent the decline of many Mediterranean sharks. In 2007, thirty species (42%) were assessed as „threatened' (CR, EN or VU) in the region (IUCN Red List 2007). Most of these species are not subject to special management.

National legislation need to support a broad range of tools adapted to the needs of different shark species, from strict protection to sustainable exploitation policies and recovery planning. As emphasised, close coordination between fisheries and marine biodiversity conservation authorities is critical to effective implementation.

3.1 Confer legal protection on threatened species

International and regional instruments mandate species-specific protection for only a very small number of shark species (see Annex C). Only five of the thirty species assessed as threatened (CR, EN, VU) in the Mediterranean are subject to strict protection requirements of varying extent and well under half are proposed for fspecial management regimes adapted to their conservation status.

Of equal or greater concern, under half of coastal States have actually implemented even these limited conservation and management requirements (see Annex D).

3.1.1 Selection of species for legal protection

3.1.1.a The listing of a shark species under an international or regional instrument for strict protection or special management, and the modification of any species listing, should be rapidly followed by action at the national level to confer an appropriate legal status on the species concerned.

3.1.1.b States should, as a minimum, confer strict legal protection on *Cetorhinus maximus, Carcharodon carcharias* and *Mobula mobular* in accordance with CMS, the Barcelona Protocol and the Bern Convention (for CITES implementation, see Guideline 3.2.2).

3.1.1.c In accordance with Article 11.2 of the Barcelona Protocol, States should extend strict protection and/or special management to shark species that are endangered or

[24] See e.g. Recommendation on the Pelagos Sanctuary for the Conservation of Marine Mammals (GFCM/31/2007/2).

threatened in zones subject to their sovereignty or jurisdiction. Species that may be considered, based on the IUCN Red List 2007 assessment, include:

⇒ Critically endangered: *Oxynotus centrina, Squatina aculeata, Squatina oculata, Squatina squatina*, Pristis pectinata, Pristis pristis, Dipturus batis*, *Leucoraja melitensis, Rostroraja alba (=Raja alba)*, Gymnura altavela, Carcharias taurus, Isurus oxyrinchus*, Lamna nasus**;

⇒ Endangered: *Squalus acanthias, Rhinobatos cemiculus, Rhinobatos rhinobatos, Leucoraja circularis, Odontaspis ferox* and *Carcharhinus plumbeus*;

⇒ Vulnerable: *Heptranchias perlo, Centrophorus granulosus, Alopias vulpinus, Galeorhinus galeus, Mustelus asterias, Mustelus mustelus, Prionace glauca* and Sphyrna zygaena*.

* denotes a species listed in Annex III of the Barcelona Protocol (List of Species whose Exploitation is Regulated) (see Annex A.2.1).

3.1.1.d States should prioritise cooperative assessment of species classified as Data Deficient (DD) and where their status is assessed as threatened, rapidly confer appropriate legal protection on the species concerned.

3.1.2 Content of legal protection

3.1.2.a National legislation should provide for categories of strict protection and regulated management, linked to lists of species annexed to the legislation. Each species of shark concerned should be listed in the appropriate annex, consistent with relevant international obligations.

3.1.2.b For each species designated as strictly protected, the following activities should be prohibited or regulated to prevent the species from becoming extinct and promote its maximum possible protection and recovery:

⇒ taking, possession, killing, commercial trade, transport and exhibition for commercial purposes of live or dead specimens, their parts or derivatives (see also Guideline 3.2). For strictly protected sharks, this should include an explicit ban on retention on board, transhipment and landing of specimens;
⇒ incidental taking, possession or killing;
⇒ disturbance, particularly during breeding, migration and other periods of biological stress;
⇒ deliberate destruction of and damage to species' habitats.

3.1.2.c Strictly protected sharks should be automatically excluded, where possible, from the list of authorised fisheries species under fisheries management legislation.

3.1.2.d Legislation should provide for the development and implementation of conservation and recovery plans for strictly protected species. Where the range area of a species extends to both sides of a national frontier or jurisdictional limit, the States concerned should cooperate to ensure its protection, conservation and management.

3.1.2.d For species designated for special management, legal measures should be designed to ensure that exploitation is only authorised where consistent with maintaining their favourable conservation status. The regulatory framework will need to address the following main issues:

⇒ management of fisheries effort, catch and bycatch (see Guidelines 3.3 -3.7);
⇒ regulation of international and domestic trade where this affects the species' conservation status (see Guideline 3.2);
⇒ ongoing research, data collection and monitoring (see Guideline 2.4);
⇒ management of damaging activities to protect species habitats and marine environmental quality (see Part 4).

3.1.3 Control of exemptions

International conservation instruments tightly control derogations from their rules for strictly protected species, using strict criteria that should be followed in national legislation.

3.1.3.a The conditions on which exemptions may be granted should be clearly specified in legislation/regulations to guide the exercise of administrative discretion, promote transparency and facilitate compliance and enforcement.

3.1.3.b Exemptions to the prohibitions described in Guideline 3.1.2.b should only be granted for scientific, education or management purposes necessary to ensure the survival of the species or to prevent significant damage, provided that the following conditions are met:

⇒ no other satisfactory solution must be available;
⇒ the exemption must not harm the survival of the population of the protected species concerned or that of any other species.

3.1.3.c Exemptions must not be granted for traditional subsistence and cultural activities of local populations where these could cause the extinction of or a substantial reduction in the number of individuals making up the populations or species of fauna, especially endangered, threatened or migratory species.

3.1.3.d Competent authorities should keep records of applications and decisions relating to exemptions and monitor exemptions granted. Information to be included in recording systems should include:

⇒ the species for which the derogation is requested and the reason why it is sought;
⇒ the alternative solutions considered and rejected;
⇒ the methods authorised for the capture or killing of the specimens and the reasons for their selection;
⇒ the location, timing and duration of any derogation granted;
⇒ details of the authority responsible for deciding the application;
⇒ the persons authorised to carry out the capture or killing;
⇒ the supervisory measures used and the results obtained.

3.1.3.e Exemptions relating to Endangered or Threatened Species listed in Annex II to the Barcelona Protocol must be notified to the Contracting Parties.

3.2 Regulate trade in accordance with international law

The UN-FAO Code of Conduct for Responsible Fisheries (§11.2.9) calls on States to cooperate in complying with relevant international agreements regulating trade in endangered species. At the global level, CITES lays down species-specific trade rules that apply to certain sharks. At the regional level, the Barcelona Protocol and the Bern

Convention require domestic trade and associated activities to be prohibited or regulated for strictly protected species.

Trade controls for endangered species and species that are potentially threatened by unsustainable levels of trade are an essential part of legal frameworks. However, defining and implementing effective measures is particularly complex for sharks, as trade is focused mainly on their parts and derivatives and the specimens themselves are taken at sea, often in waters beyond national jurisdiction. This issue is being closely studied by the CITES Secretariat in collaboration with UN-FAO and, for shark species under the mandate of a RFMO, by the GFCM and ICCAT (see Annex A et Annex B).

Trade controls should always be supported by education and awareness-building amongst target groups or communities that take, use or consume sharks, their parts and derivatives.

3.2.1 Basic administrative and regulatory requirements

3.2.1.a Each State should designate a Management Authority with powers to issue regulations for CITES implementation, as well as a Scientific Authority to advise on permit applications in accordance with CITES. For decisions relating to sharks, the Scientific Authority should include or have access to specialised fisheries scientists.

3.2.1.b The CITES Management Authority should collaborate with the national fisheries authority to supply information to the CITES Secretariat to facilitate the review by the CITES Animals Committee, in collaboration with UN-FAO, of the list of shark species of concern[25] and the preparation of species-specific recommendations. Information should cover:

- ⇒ implementation of IPOA-Sharks and shark assessment reports, where applicable;
- ⇒ data on landings and exports;
- ⇒ management measures adopted for shark species of concern.

3.2.1.c Where a State uses nature conservation or customs legislation to implement CITES, it needs to be broad enough to cover marine species (e.g. the definition of “animal” must be broad enough to cover fish).

3.2.1.d Where fisheries legislation is used to implement CITES with regard to marine species, its provisions need to be fully consistent with the procedures and criteria laid down by CITES.

3.2.1.e Whatever type of legislation is used, “specimen” should be broadly defined to cover live and dead specimens of listed chondrichthyan species and their readily recognisable parts or derivatives[26]. To facilitate enforcement, regulations should list the main shark parts and derivatives that are most likely to feature in trade (e.g. fins, teeth, jaws, meat, cartilage, oil, raw hides, skins and leather).

3.2.1.f Legislation/regulations should clearly specify which agencies and classes of officers are responsible for enforcing trade controls. Personnel, including Customs officers, may

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[25] *Centrophorus spp.*,*Galeorhinus galeus*, *Carcharhinidae*, *Rhinobatiformes*, *Mobulidae* (see **Erreur ! Source du renvoi introuvable.**).

[26] Readily recognizable parts or derivatives shall be interpreted to include any specimen which appears from an accompanying document, packaging, mark or label, or from any other circumstances, to be a part or derivative of an CITES-listed animal, unless such part or derivative is specifically exempted from the provisions of the Convention (Res.Conf.9.6, amended at COP11 and corrected by the Secretariat following COP14).

need to be trained in recognition skills, especially for the most commonly traded parts and derivatives (fins, jaws, teeth…).

3.2.1.g States should contribute to and make available manuals and guides for the identification of sharks and shark products in international trade, using materials available through UN-FAO and the CITES Secretariat (see also Guideline 2.4.2).

3.2.2 Regulation and monitoring of international trade

3.2.2.a The import, introduction from the sea, export or re-export of any specimen, part or derivative of *Pristis pectinata, Pristis pristis* (CITES Appendix I-listed) or of *Cetorhinus maximus* and *Carcharodon carcharias* (CITES Appendix II-listed) should be prohibited except under permit issued in accordance with the conditions laid down in CITES Articles III or IV respectively.

3.2.2.b A certificate for the introduction from the sea[27] of a specimen of any species listed above may only be issued if the Scientific Authority determines that this will not be detrimental to the survival of the species concerned. The Authority should take account of the best available scientific information on the stock concerned as well as recommendations or technical guidance issued by CITES, UN-FAO and /or the competent RFMO[28].

3.2.2.c If national legislation provides for exemptions, these should be consistent with Article VII of CITES and worded in precise and unambiguous language.

3.2.2.d Each State may adopt stricter domestic measures, including full prohibition, on trade, taking, possession or transport of sharks listed in the Appendices to CITES as well as non-CITES species (article XIV). For this purpose, it should prioritise species classified as threatened (CR, EN, VU) that are not yet protected or specially managed at national level.

3.2.2.e States should take all necessary steps, including inspection and provision of information to merchants, to prohibit the sale of tourist souvenir specimens of Appendix-I shark species in places of international departure, such as international airports, seaports and border crossings and particularly in duty-free areas beyond Customs control points.

3.2.3 Regulation and monitoring of domestic trade

3.2.3.a Domestic trade in strictly protected sharks, their parts and derivatives should be prohibited or subject to regulation. To promote legal certainty, it is preferable to list the specific activities that are controlled e.g. possession, transport, sale, exchange, offering for sale or exchange, purchase, exhibition, display for commercial purposes,

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[27] Defined at art.1.e of CITES as "transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State".

[28] With regard to Appendix II species, art.IV.7 of CITES provides that the Scientific Authority may deliver such certificates after consultation with other national scientific authorities or, when appropriate, international scientific authorities, in respect of periods not exceeding one year for total numbers of specimens to be introduced in such periods.

processing, taxidermy, serving in restaurants or consumption of any specimen, part or derivative of a protected species.

3.2.3.b Exemptions should be subject to permit. The legal basis for exemptions should be narrow, precisely worded and accompanied where appropriate by necessary conditions. Exemptions should only be granted for specimens that have been lawfully imported (e.g. under a scientific research permit). A record should be kept of exemptions granted.

3.2.3.c To facilitate enforcement, legislation may require a person found in possession of a strictly protected specimen to prove that the specimen was lawfully introduced into the country or otherwise lawfully obtained. Possession is deemed to be unlawful if the person in possession cannot produce the necessary proof.

3.2.3.d In States with a regionalised system of government, controls on trade, transport and possession should be harmonised at national level to ensure consistency.

3.2.4 Detection and enforcement of offences

3.2.4.a States should establish meaningful penalties for illegal trade or associated activities relating to protected species of sharks.

3.2.4.b The legal framework should confer general powers on enforcement officers, subject to the law of the country concerned, to search vessels, persons and premises and to request information, inspect documents and, if necessary, make arrests.

3.2.4.c Powers should be available to seize specimens if enforcement officers have reasonable grounds to believe that these are traded or possessed in contravention of the law, and to confiscate equipment and/or methods of transport used in the commission of the offence.

3.2.4.d The disposal of illegally traded, confiscated and accumulated specimens should be handled in accordance with the detailed recommendations set out in CITES Conf. 9.10 (Rev. CoP14). No Appendix I-listed specimen, part or derivative should be sold or otherwise disposed of in any way that would result in its being the object of trade.

3.2.4.e Legislation should provide for the recovery of costs of seizure, confiscation and disposal from the importer and the person for whom the import has taken place. Where the identity of these persons cannot be established, costs should be recoverable from the transporter.

3.3 Promote sustainable fisheries management

In 2007 and 2008, the UN General Assembly called on States, including through RFMOs, to urgently adopt measures to fully implement IPOA-Sharks for directed and non-directed fisheries, based on the best available scientific information.

The Chondrichthyan Action Plan (§11.3) supports the development of management programmes for sustainable fisheries catching commercially important species as target or bycatch:

- it prioritises action for the main commercial species: dogfish (*Squalus acanthias*), thresher sharks (*Alopias* spp.), makos (*Isurus* spp.), porbeagle (*Lamna nasus*), blue shark (*Prionace glauca*);

- in addition, for other commercially important species: angel sharks (*Squatina* spp.), catsharks (*Scyliorhinus* spp. and *Galeus melastomus*), hound sharks (*Mustelus* spp. and *Galeorhinus galeus*), requiem sharks (*Carcharhinus falciformis*, *C. limbatus, C. obscurus* and *C. plumbeus*), skates (*Leucoraja* spp., *Raja* spp.), and stingrays (*Dasyatis* spp.).

Since the adoption of the Action Plan, the conservation status of several of these species has worsened. In 2007, the IUCN Red List assessment for these species was as follows:
- **Critically Endangered**: *Isurus* spp., *Lamna nasus*, *Squatina* spp., *Leucoraja* spp.;
- **Endangered:** *Squalus acanthias*; *C. plumbeus*;
- **Vulnerable**: *Alopias* spp., *Prionace glauca*, *Mustelus* spp., *Galeorhinus galeus*;
- **Near Threatened**: *Scyliorhinus stellaris, Raja* spp., *Dasyatis* spp.;
- **Least Concern**: *Scyliorhinus canicula, Galeus melastoma*;
- **Data Deficient**: *Carcharhinus falciformis*, *C. limbatus, C. obscurus*.

States are therefore encouraged to extend priority management measures to <u>all</u> species now assessed as CR or EN, including *Squatina* spp., *Carcharhinus plumbeus* and *Leucoraja* spp. The unfavourable conservation status of many commercially important species makes it imperative to adopt and enforce measures to prevent further decline or stock collapse.

The fishing sector in each Mediterranean State varies in terms of its size, target species, main fishing areas and gear and techniques used. Guideline 3.3.1 covers generally applicable matters for developing regulations for sustainable fisheries management. Subsequent Guidelines are more technical and may not be equally applicable to all States.

3.3.1 Legal tools to regulate fishing effort and catch

3.3.1.a National fisheries law and regulations should be consistent with the objectives, scope, approaches and content outlined in Part 1 of these Guidelines.

3.3.1.b Implementation should be supported by cross-sectoral coordination and research, data collection and monitoring (see Part 2 of these Guidelines). States should contribute actively to the development and, where necessary, the strengthening of shark protection and management measures adopted by RFMOs or other competent organisations.

3.3.1.c Fisheries stakeholders need to be involved in formulating policy and management strategies for relevant resources[29]. Legal rules for implementation of fisheries conservation and management measures should be effectively disseminated.

3.3.1.d All States should have a licensing system for commercial fisheries to manage access to and effort in fisheries within waters under their jurisdiction and to regulate fishery activities by vessels flying their flag in waters beyond national jurisdiction.

3.3.1.e Fisheries regulations should avoid unnecessary complexity. They should comply with rules and recommendations adopted and updated by RFMOs and, where

[29] See e.g. FAO Code of Conduct for Responsible Fisheries, section 6.16.

appropriate, other competent organisations (see Annex B).

3.3.1.e Regulations should apply to foreign fishing in waters under national jurisdiction and specify the conditions on which foreign fishing vessels may be allowed access to such waters and to national ports (see also Guideline 3.7).

3.3.1.f The regulatory framework should support the full range of management measures needed to adapt fishing activities to the state of fishery resources and promote stock recovery, consistent with the ecosystem approach and precautionary principle (see Box 6).

Box 6 Legal tools to support sustainable management of fisheries

- „Input' measures to **regulate fishing capacity and effort**. Measures to eliminate excessive fishing pressure on sharks include capacity limitations (e.g. adjustment of subsidies available for certain fisheries and equipment, number of fishing licences issued or number of vessels authorised) and effort limitations that reduce the fishing activity of fleets.

- „Output' measures to **regulate catch**. These are aimed at directly reducing mortality on target species and could include the introduction of catch limits (Total Allowable Catch) for individual shark species, set at a precautionary level where scientific data is inadequate or unreliable. They may be complemented with measures to reduce bycatch.

- **Time/area restrictions**. These reduce fishing effort by prohibiting or limiting fishing in particular areas (e.g. critical habitats of a shark species, see Guideline 4.1) and/or at certain times or seasons when sharks are biologically vulnerable. Spatial and temporal controls may apply to all fisheries or just to specified categories of fisheries or vessels. Establishment of close or specially regulated fishing areas is a key measure for reconstitution of fish stocks (see e.g. GFCM/31/2007/2).

- Technical measures to **regulate fishing gear** aim to improve catch selectivity and reduce negative impacts on the marine environment and its resources in the course of commercial fisheries. They include size-selectivity options such as mesh size restrictions; bycatch reduction devices; use of biodegradable equipment; avoidance of destructive fishing methods in sensitive habitats; and adjustments to fishing operations and methods (see Guideline 3.4).

- Controls on **deliberate discarding or abandonment of fishing gear** which contributes to incidental mortality as well as environmental degradation. The UN-FAO Code calls on States to cooperate to develop and apply technologies, materials and operational methods that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear (section 8.4.6).

- Measures to **minimise waste, discards and pollution** in the course of fisheries operations (consistent with the UN-FAO Code, sections 8.7.1-4). These should comply with the the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), including with regard to disposal of oily waste and the handling and storage of shipboard garbage.

3.3.2 Management of directed shark fisheries

Directed fisheries affect a relatively low number of shark species in the Mediterranean (cf bycatch which affects all shark species in the basin).

Nevertheless, targeted fishing pressure is considered to have led to the collapse of stocks of some species now considered locally extirpated or commercially extinct in the Mediterranean, including *Dipturus batis*, *Squatina aculeata* and *S. oculata*. In addition, data

collected are incomplete and some of the most important landings are not recorded due to several species being reported under one group (Cavanagh and Gibson, 2007). It is known that during certain seasons or in particular areas, fisherman do target sharks even though this is not officially reported[30].

3.3.2.a Regulatory frameworks for directed fisheries should be designed to prevent overfishing and support sustainable management of stocks, based on the best available scientific information[31]. Appropriate measures for this purpose could include zero or limited catches, closure or suspension of unsustainable fisheries and size thresholds for authorised catches (see Box 6)[32].

3.3.2.b For species assessed as CR or EN (IUCN Red List 2007), States should prioritise measures to prohibit or restrict targeting such species in fisheries within waters under their jurisdiction, and carried out by vessels flying their flag in waters beyond national jurisdiction, and should promote the adoption of equivalent measures by RFMOs.

3.3.3.c Where scientific information is inadequate to determine sustainable catch limits for particular species, States (in collaboration with RFMOs and other competent organisations) should establish precautionary measures to ensure the long-term conservation, management and sustainable use of shark stocks and prevent further decline of vulnerable or threatened shark stocks[33].

3.3.3.d Each fisheries service should maintain a register of licences, issued to authorised fishing vessels, to conduct shark fisheries in waters under its jurisdiction and, for flag vessels, in waters beyond national jurisdiction. Vessels not included in this register should be deemed not be authorised to fish for, retain on board, tranship, transport, transfer or land sharks in the State concerned.,

3.4 Minimise bycatch and incidental mortality of sharks

All shark species in the Mediterranean are currently threatened or potentially threatened through bycatch in commercial fisheries, with the percentage of affected species varying according to the type of fishing gear (see Figure 2). The extent of bycatch is often poorly documented as most bycatch is estimated to be discarded at sea and not reported in official statistics.

Bycatch occurs in the course of directed fisheries for other species managed by RFMOs. Changes to fisheries effort, gear and methods are essential to ensure that incidental catch levels do not exceed sustainable limits. Several species currently assessed as Near Threatened may be unable to withstand continued indirect exploitation pressure e.g. *Dipturus oxyrinchus, Dasyatis pastinaca, Myliobatis aquila*.

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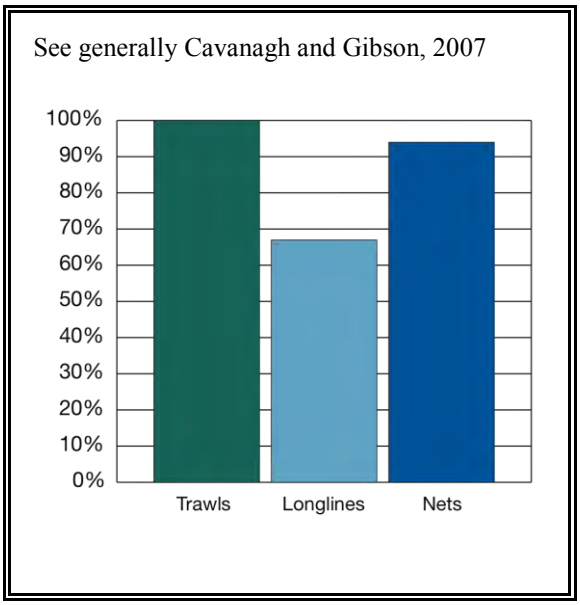
[30] Alen Soldo, pers.comm.

[31] This will include advice of RFMO Scientific Committees and, where available, the CITES Animal Committee and the CMS Scientific Committee.

[32] ICCAT is currently considering possible catch limits to reduce mortality in fisheries targeting *Lamna nasus, Isurus oxryinchus* and *Prionace glauca* (see Annex B).

[33] Consistent with UNGA Resolution 62/177 (2007), §11.

Figure 2 Percentage of chondrichthyans threatened by different types of bycatch



3.4.1 General regulatory measures

3.4.1.a Regulatory frameworks should be designed to minimise shark bycatch, as well as waste, discard of dead specimens and catch resulting from lost or abandoned fishing gear, in the course of fisheries in waters under national jurisdiction, or carried out by flag vessels in waters beyond national jurisdiction[34].

3.4.1.b States should:

- ⇒ promote research into and development of more selective fishing gear, methods and practices, cooperating with other States, RFMOs and other competent organisations;
- ⇒ align relevant regulations with recommendations and/or technical guidance progressively updated by RFMOs or other competent organisations;
- ⇒ provide for environmental impact assessment with reference *inter alia* to possible habitat disturbance before new fishing gear, methods and operations are introduced on a commercial scale to an area[35].

3.4.1.c For species assessed as CR and EN (IUCN Red List 2007), Mediterranean States should seek to establish bycatch reduction programmes aimed at zero bycatch.

3.4.1.d Where scientific information is inadequate to determine bycatch levels for shark species not subject to management, States should establish precautionary bycatch limits. These may take the form of a fixed percentage of target catch (e.g. 5%) within multispecies fisheries, calculated either by reference to the number of bycaught fish per landing out of the total catch or to their equivalent as percentage of weight. In fisheries where quotas apply, bycatch should be deducted from the quota of the flag State.

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[34] ICCAT Resolution 2001-11 calls on Members to minimise waste and discards from shark catches in accordance with article 7.2.2.(g) of the Code of Conduct for Responsible Fisheries.

[35] Consistent with Article 8.4.7.of the UN-FAO Code of Conduct for Responsible Fisheries.

3.4.1.e The discard of dead bycatch sharks at sea should be minimised to reduce unaccounted fishing mortality. Live specimens caught as bycatch, especially juveniles, should be released at sea to the extent possible[36], particularly where they belong to threatened species and/or have high discard survival rates. Regulations should require full notification of data on all bycatch, consistent with procedures established by RFMOs.

3.4.1.f Fishers should be provided with information and, where necessary, training on techniques for minimising, safe handling and releasing of bycatch and any rules applicable to protected species. These should be published in appropriate languages and circulated to all potential users.

3.4.2 Bycatch in trawls

Bycatch in trawls is considered the greatest threat to sharks in the Mediterranean, although selectivity by trawl nets for size of sharks is still not yet well understood.

Bottom-dwelling species vulnerable to demersal trawling include several large skates and rays, the three species of angelsharks *Squatina spp*. and *Oxynotus centrina*. Other affected species include *Scyliorhinus* spp*., Galeus melastomus*, *Mustelus* spp*.,* squalidae (*Centrophorus* spp*., Squalus* spp*., Etmopterus spinax)* and *Chimaera monstrosa*. Intensive bottom-trawling also reduces the complexity of benthic habitats, affects the epiflora and epifauna and reduces the availability of suitable habitats for predators and prey. Pelagic trawling adversely affects several species, though possibly not at all life stages (see generally Tudela 2004 and Cavanagh and Gibson 2007).

3.4.2.a States should as a minimum prohibit:

- ⇒ trawling at shallow depths to protect species dependent on fragile coastal habitats[37];
- ⇒ use of towed dredges at depths beyond 1,000m[38].

3.4.2.b Fishery managers should investigate options for fitting bycatch reduction devices in trawl nets to allow escapement of sharks and for adapting „turtle excluder devices' to facilitate their exclusion.

3.4.2.c Maximum trawl time may be regulated to increase the chance of trapped specimens being brought alive to the surface.

3.4.2.d States should consider establishing closed areas and seasons for trawling, where appropriate, to protect shark spawning and nursery areas and other critical habitats (see also Guideline 4.1 below).

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[36] Consistent with e.g. ICCAT Recommendations 04-10 and 08-07.

[37] e.g. EC Regulation No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea lays down a series of restrictions on the use of certain fishing gear in shallow waters (art.13).

[38] Recommendation GFCM/2005/1 on the management of certain fisheries exploiting demersal and deepwater species deepwater fisheries.

3.4.3 Bycatch in drift nets and gill nets

Bycatch in nets (gillnets, purse seines and driftnets) is considered a possible threat to 67 (94%) of Mediterranean sharks. Pelagic drift nets are gillnets set at or near the sea surface to catch pelagic fish such as herring, tuna or mackerel. Migratory oceanic sharks form a large component of bycatch from large pelagic driftnet fisheries for tuna and billfishes e.g. *Cetorhinus maximus*, *Prionace glauca*, *Isurus oxyrinchus*, *Alopias* spp. and *Lamna* spp. At least two species evaluated as CR in the Mediterranean (*Pristis pectinata* and *P. pristis*) are vulnerable to bycatch in nets due to their large rostra.

At international and regional level, the prohibition of large-scale drift nets (individual or total length above 2.5 km) has been mandated since 1992[39]. Stricter EU measures apply to fishing in Community waters and to Member State-flagged vessels anywhere in the world[40].

However, lack of adequate monitoring and enforcement remains a major problem and unlawful drift netting is still carried on by fishing vessels of some Mediterranean States.

3.4.3.a States should prohibit the keeping on board or use of drift nets in fisheries in waters under their jurisdiction or carried out by flagged fishing vessels under their jurisdiction or control in accordance with international or European Community law, as applicable. They should also prohibit the manufacture, sale, distribution or transfer of such drift nets to facilitate compliance.

3.4.3.b Stronger regional cooperation is essential, particularly within the framework of RFMOs, to monitor, exchange information, take necessary enforcement action against illegal drift netting and impose meaningful penalties, including confiscation of illegal gear (see Guideline 3.7).

3.4.3.c Deepwater gillnet fisheries should be prohibited below the limit of 1000 metres[41]. It may be appropriate to extend this prohibition to protect threatened deepwater shark species occurring at shallower depths than 1000 metres.

3.4.3.d Regulations to improve the selectivity of net fisheries may address gillnet mesh size and selection of web filaments (which determine breaking strain) to ensure that sharks are large enough to avoid growth overfishing and small enough to facilitate escapement of large breeding animals (UN-FAO 2000).

3.4.4 Bycatch in longline fisheries

Bycatch in longlines fisheries is a potential threat to 48 (67%) of shark species in the Mediterranean. Longline fisheries targeting swordfish and tunas pose a particular threat to certain species assessed as CR or EN, including *Lamna nasus, Isurus oxyrinchus, Carcharhinus plumbeus Mobula mobular* and *Prionace glauca*.

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[39] UNGA Resolution 46/215 of 20 December 1991; UNGA Resolution 52/29 of 26 November 1997; for GFCM and ICCAT recommendations, see Annex B.

[40] EC Council Regulation No 1239/98 of 8 June 1998, extended to cover the Baltic Sea by Regulation 812/2004. A specific common definition of „driftnet' was adopted in Council Regulation (EC) No 809/2007 of 28 June 2007.

[41] Recommendation GFCM/2005/1 on the management of certain fisheries exploiting demersal and deepwater species. This has improved the conservation status of at least two vulnerable deepwater species (*Centroscymnus coelolepis*, *Somniosus rostratus*,) because they are now protected against fisheries bycatch.

Most sharks can remain alive on hooks for extended periods and be released alive. There may be scope to improve survival by prohibiting the use of wire traces used to attach hooks to the snoods on a longline and by regulating for reduced breaking strains of the snoods. Wire traces reduce the probability of hooks being bitten off the snoods (UN-FAO 2000, UN-FAO 2005).

3.4.4.a Fisheries regulations should comply with RFMO rules and recommendations applicable to pelagic longline fisheries currently in force.

3.4.4.b Regulatory options to reduce bycatch from longlines, in accordance with research findings, may include minimum requirements related to line length, number and design of hooks, distance between hooks, kind of bait, times of setting and hauling, length of line and minimum depth at which bottom long lines may be set.

3.5 Prohibit or regulate shark finning

Shark finning refers to the removal and retention of shark fins with the rest of the shark discarded at sea. The practice is highly wasteful as only 2–5% of the shark is used, the remainder being thrown away (partly for reasons of space on board vessels). Increasing demand for shark fins, driven by traditional Asian cuisine, has triggered a sharp increase in fin prices and increased the incentive to target sharks that might previously have been released alive.

Shark finning hampers onshore monitoring and surveillance of catch, either because carcasses are jettisoned immediately after finning and never appear in statistics or because they are landed already finned which makes them much harder to identify (see Guideline 2.4.2).

At international level, there is consensus on the need to regulate and phase out this practice for trade monitoring and management purposes as well as conservation[42].

3.5.a States with fisheries that capture sharks, whether in directed fisheries or as bycatch in other fisheries, or which facilitate the landing of shark products by international flag vessels, should require that all sharks be landed with the fins attached to their bodies[43].

3.5.b Skin, claspers and, where applicable, dorsal spines should also remain attached to facilitate the making of species-specific landings records and to promote full utilisation of shark catches.

3.5.c Pending the adoption of regulatory measures consistent with 3.5.a-b, the authorised fin-to-carcass ratio should not exceed 5% of dressed weight (or 2% of whole weight). Fins and carcasses should be offloaded together at the point of first landing: where this is not possible, compliance with applicable ratios should be verified through certification, monitoring by an observer, or other appropriate measures.

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[42] UNGA Resolutions 62/177 (2007), §12 and 63/112 (2008) §14, Chondrichthyans Action Plan (§19), RFMO recommendations and relevant EU legislation (see Annex A and Annex B).

[43] This is aligned with UNGA 62/177 (2007) but goes beyond the requirements of e.g. ICCAT Recommendation 04-10.

3.5.d National regulations should, in addition:

⇒ cover the full range of actions related to shark finning;
⇒ prohibit fishing vessels from retaining on board, transhipping or landing any fins harvested in contravention of applicable regulations;
⇒ provide for collection and reporting of species-specific biological and trade data (see Box 7 for an example of national legislation for this purpose).

Box 7 Example of national legislation on shark finning (United States)

The Shark Finning Prohibition Act 2000* applies to all persons/vessels fishing in waters under national jurisdiction and prohibits:

- removing any of the fins of a shark (including the tail) and discarding the carcass of the shark at sea;
- having custody, control, or possession of any such fin aboard a fishing vessel without the corresponding carcass; or
- landing any such fin without the corresponding carcass.

"Shark finning" is defined as the taking of a shark, removing the fin or fins (whether or not including the tail) of a shark, and returning the remainder of the shark to the sea.

The Act creates a rebuttable presumption that any shark fins landed from a fishing vessel or found on board a fishing vessel were illegally taken, held, or landed if the total weight of shark fins landed or found on board exceeds 5% of the total weight of shark carcasses landed or found on board.

The competent minister is required to keep records and submit an annual report to Congress containing a list that identifies nations whose vessels conduct shark-finning and details the extent of the international trade in shark fins, including estimates of value and information on harvesting of shark fins, and landings or transshipment of shark fins through foreign ports.

* Public Law n°106-557 "to eliminate the wasteful and unsportsmanlike practice of shark finning", amending Art.307(1) of the Magnuson-Stevens Fishery Conservation and Management Act.

3.6 Manage recreational fisheries taking sharks

There is no common regulatory framework for recreational fisheries in Mediterranean waters. Information is lacking on catch volumes as well as on the level of fishing effort for this type of fishery (see generally Gaudin and de Young, 2007). However, RFMOs have begun to address this issue in recent years, *inter alia* to ensure that recreational fishing activities do not undermine sustainable exploitation of the stocks covered by their mandate.[44]

Recreational shark fisheries have increased noticeably over the past few years, particularly off the Italian, Spanish and French coasts. Although data are limited, target species mainly include thresher sharks *Alopias spp*. and blue shark *Prionace glauca* (e.g. summer fishery in the Adriatic Sea) and porbeagle *Lamna nasus*. These species are also targeted by commercial fisheries.

[44] e.g. ICCAT Recommendation 04-12, adopted by the GFCM in 2005; ICCAT Resolution TOR 06-17 establishing a Working Group on amateur and sport fisheries. In 2006 the GFCM has recognised recreational fisheries as a new priority area of study and commissioned a review of existing legal frameworks (Gaudin and de Young 2007). Recreational fisheries are also addressed in EC Regulation on management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea [(EC) No 1967/2006 of 21 December 2006.

3.6.a States should include recreational fisheries in their legal and management frameworks to conserve and sustainably manage marine resources in accordance with UNCLOS, the UN-FAO Code of Conduct, the ecosystem approach and the precautionary principle.

3.6.b Legislation should clearly define the terminology, rules and procedures applicable to different categories of recreational fishing. A permit system should be established to make it possible to regulate access to target resources and support collection of biological and socio-economic data.

3.6.c Regulations and/or conditions attached to permits should be based on the best available scientific information, following consultation with the recreational fisheries sector and other relevant stakeholders. Such measures, similar to those used for commercial fisheries regulation (see Box 6) and may include:

- ⇒ limitation on the number of boats/permits to limit overall fishing effort;
- ⇒ individual catch quotas e.g. in the form of daily bag limits for targeted species;
- ⇒ limitation of fishing gear to minimise bycatch from recreational fisheries;
- ⇒ minimum landing sizes;
- ⇒ a requirement to release, wherever possible, specimens caught alive, especially juveniles (i.e. catch-and-release angling);
- ⇒ establishment of closed areas and seasons;
- ⇒ a prohibition on the sale, barter, transport or marketing of sharks caught in recreational or sport fishing.

3.6.d For shark species subject to protection or management measures (see Guideline 3.1):

- ⇒ recreational fisheries should be prohibited for strictly protected species;
- ⇒ recreational fisheries targeting species subject to special management (including species vulnerable to over-fishing) should be subject to special permit;
- ⇒ lists of species in each of these categories should be annexed to relevant regulations and widely disseminated to stakeholders.

3.6.e For recreational fisheries targeting highly migratory species of fish, States should cooperate at the appropriate level to develop common conservation and management measures.

3.7 Enforce controls on illegal, unregulated and unreported fishing

Illegal, unregulated and unreported (IUU) fishing activities undermine the effectiveness of conservation and management measures adopted at national and regional level. Over 80% of COFI Members identify IUU fishing as a problem.

3.7.a States have a duty to curb IUU fishing in accordance with UNCLOS, the 1993 UN-FAO Compliance Agreement, the 1995 UN Fish Stocks Agreement and recommendations adopted by GFCM and ICCAT. National measures should be developed in accordance with these requirements and updated as new recommendations are adopted at regional level.

3.7.b At national level, responsibility for enforcing relevant legislation may come under several administrations (port authorities, fisheries administrations, customs agencies,

Coast Guard, the navy, local authorities etc.). Where necessary, States should take steps to raise awareness of key personnel and to build coordination and capacity for law enforcement.

3.7.c Each Flag State should put procedures in place to monitor the activities of its fishing vessels and maintain a register of flag vessels authorised to fish on the high seas. In the event of non-compliance with applicable legal requirements, it should take enforcement measures and apply appropriate sanctions (see also Guideline 3.7.d).

3.7.d Each coastal State should extend monitoring, inspection and surveillance measures to non-flag vessels authorised to fish in waters under its jurisdiction.

3.7.e States should promote and, where appropriate, implement cooperative measures to ensure compliance with regional and international obligations in the high seas, consistent with procedures adopted by RFMOs (see Annex B). These should *inter alia* include:

- ⇒ observer programmes, inspection schemes and vessel monitoring systems to provide for satellite tracking of fishing vessels[45];
- ⇒ implementation of strengthened, harmonised and transparent Port State measures in accordance with Recommendation GFCM/2008/1 on a Regional Scheme on Port State measures to combat IUU in the GFCM area[46];
- ⇒ implementation of measures to regulate transhipment[47] in accordance with ICCAT Recommendation [06-11], adopted for the Mediterranean by GFCM/31/2007/3[48].

3.7.f National legislation should provide for enforcement measures and sanctions with respect to vessels flying its flag that are in breach of applicable requirements. Penalties may include, depending on the gravity of the offence and in accordance with the pertinent provisions of national law:

- ⇒ fines;
- ⇒ seizure of illegal fishing gear and catches;
- ⇒ sequestration of the vessel;
- ⇒ suspension or withdrawal of authorisation to fish;
- ⇒ reduction or withdrawal of the fishing quota, if applicable.

3.7.g Without prejudice to relevant international agreements, States should encourage banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures (UN-FAO Code section 7.8.1).

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45 Under current GFCM and ICCAT regulations, minimum vessel monitoring requirements apply to bluefin tuna fishing vessels over 24 m but will be extended to vessels over 15 m from 1 January 2010 (GFCM/31/2007, adopting ICCAT Recommendation 06-05).

46 Aligned with the draft Agreement on Port State measures under development within UN-FAO.

47 Transhipment at sea (the transfer of fish from fishing vessels to transport ships (reefers)) is a well-established way to avoid detection of IUU as it removes the need for IUU fishing vessels to enter ports and makes it easier to launder an illegal catch by mixing it with legally caught fish on board these transport vessels.

48 Texts available at http://firms.fao.org/gfcm/topic/16100.

4 INTEGRATE MANAGEMENT OF MARINE AND COASTAL ECOSYSTEMS

4.1 Identify and protect critical habitats for sharks

The identification and protection of critical habitats is recognised as a key part of shark conservation and management under IPOA-Sharks (§6) and mandated by several international instruments applicable to sharks (CMS, Barcelona Protocol, Bern Convention).

Scientific criteria for identifying ecologically or biologically significant marine areas beyond national jurisdiction could include: uniqueness or rarity; special importance for the life-history stages of species; importance for threatened, endangered or declining species and/or habitats; vulnerability, fragility, sensitivity or slow recovery; biological productivity; biological diversity and naturalness[49].

Mediterranean areas already identified as critical habitat for sharks include Tunisian waters providing a nursery area for *Carcharodon carcharias* and areas of aggregation for *Cetorhinus maximus* in the northern Balearic region, Northern Adriatic and Tyrrhenian Sea. Some species have a restricted range within the Mediterranean e.g. a small population of *Odontaspis ferox* seems resident in a particular area off Lebanon (Cavanagh and Gibson 2007).

4.1.a States should promote and support field studies to inventory and map critical habitats around the Mediterranean at all stages of shark life cycles (mating areas, spawning and nursery grounds, winter feeding grounds, migration routes etc.).

4.1.b Inventories should build on existing databases and survey programmes where possible and be developed in cooperation with fisheries, environmental and other concerned stakeholders, nationally and within the region. They should be regularly updated to integrate new data.

4.1.c Inventories need to provide information on the location, ecological role and conservation status of critical habitats so that planning and management tools can be selected and prioritised to make best use of available resources.

4.1.d Legislation should provide, to the extent possible, for the designation and protection of critical habitats of strictly protected sharks and of species subject to special management (see examples in Box 8). Allowing for differences between national legal systems, the procedure leading to designation should follow these basic steps:

- ⇒ identification of candidate sites (requires an understanding of species composition, stock structure, aggregation patterns, level of vulnerability to fishing etc.);
- ⇒ assessment of candidate sites to identify which sites may deliver greatest benefits (viability in terms of size, shape, boundaries etc.);
- ⇒ selection of sites, following consultation with affected sectors and stakeholders;
- ⇒ delimitation of site boundaries on a map annexed to primary legislation or incorporated in fisheries and/or marine environmental regulations;
- ⇒ choice of management regime (see below). Legislation may provide that basic protection measures apply automatically once a critical habitat is legally designated, to avoid administrative delay in implementation.

4.1.e Measures applied to protected critical habitats should be designed to prevent

[49] Criteria set out in Annex 1 of CBD Decision IX/20 *Marine and coastal biodiversity* (COP9, Bonn, 19-30 May 2009).

negative impacts of human activities, including but not limited to fisheries, and to support monitoring, management and recovery activities. These could include:

⇒ permanent or seasonal closure to fisheries (e.g. to protect aggregations of sharks);
⇒ modification of fishing gear;
⇒ controls on dumping and discards;
⇒ restrictions on navigation consistent with international law e.g. exclusion of certain categories of vessel, speed restrictions;
⇒ establishment of marine protected areas (see Guideline 4.2).

4.1.f Public bodies responsible for the planning, authorisation and oversight of potentially damaging activities should be formally notified of the location of listed critical habitats and should ensure that such activities do not adversely affect the site or conflict with its management objectives.

Box 8 Examples of legislative measures to protect critical habitats

New South Wales (Australia): Fisheries Management Act 1994 N° 38 http://www.dpi.nsw.gov.au/fisheries
"The whole or any part of the habitat of an endangered species, population or ecological community or critically endangered species or ecological community that is critical to the survival of the species, population or ecological community is eligible to be declared… to be the critical habitat of the species, population or ecological community" (Art. 220P.1).

Canada: Fisheries Act 1985 (http://laws.justice.gc.ca/en/F-14/)
The Act prohibits, except under a permit, any work or undertaking resulting in the harmful alteration, disruption or destruction of fish habitats (defined as "spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes") (arts.34-35). The impact of projects potentially affecting fish habitats must be considered before an activity may begin.

4.2 Adopt or strengthen legislation for marine protected areas

Marine protected areas (MPAs) may provide an important conservation and management tool for sharks, depending on the biological and migratory characteristics of the species concerned and the scale of threats identified.

At the global level, the UN General Assembly has called for greater cooperation in this area among relevant international organisations and bodies. Criteria on objectives and management of MPAs have been adopted under the Convention on Biological Diversity[50]. UN-FAO is developing technical guidelines for the implementation and testing of MPAs for fisheries purposes.

At the regional level, the Barcelona Protocol mandates the creation not only of MPAs in waters under national jurisdiction but also of Specially Protected Areas of Mediterranean Importance (SPAMI) which may be established on the high seas with the approval of the Meeting of the Parties. All Parties are bound by the protection rules adopted for a SPAMI.

[50] CBD Decision IX/20 (Annex II) provides scientific guidance for designing representative networks of marine protected areas. See further Kelleher G. (ed.) 1999. *Guidelines for Marine Protected Areas*. IUCN Best Practice Protected Area Guidelines Series No.3, available for download from http://www.iucn.org/themes/wcpa/pubs/guidelines.htm.

Establishing MPAs in waters beyond national jurisdiction raises questions of governance: their effectiveness depends on multilateral cooperation by users of the area and its resources.

4.2.a States that have not already done so should adopt or amend legislation to provide a legal and institutional framework to establish and manage marine protected areas.

4.2.b This legislation may be site-specific or take the form of framework legislation that establishes powers to create marine reserves by secondary regulations. Site-specific legislation may be particularly appropriate for large MPAs.

4.2.c Consistent with the Barcelona Protocol (Art.10), the legislation should provide that any modification of the MPA's boundaries or its legal regime, or the delisting of all or part of the MPA, should be subject to the same legal procedure used for its establishment.

4.2.d The MPA's primary objective should be conservation of biological diversity and biological productivity. Legislation should recognise the link between protection and maintenance of ecological processes and the ecologically sustainable use of marine living resources.

4.2.e MPA management responsibility may be allocated to an existing agency or to a dedicated cross-sectoral body, depending on the nature of the MPA. Relevant authorities and agencies with responsibility for activities affecting the MPA should cooperate in MPA planning and management. If necessary, a procedure for resolution of conflicts between different stakeholders should be put in place.

4.2.g Public participation and consultation are important to engage local communities, NGOs and users of the coastal and marine environment e.g. representation on a consultative committee.

4.2.h The protection and management regime for an MPA should be aligned with a State's international commitments. Consistent with the Barcelona Protocol, regulations should cover the dumping or discharge of waste or harmful substances; the passage, stopping or anchoring of ships; the introduction of alien species and genetically modified organisms; activities involving the exploration of the sea-bed; fishing and hunting; and taking and destruction of and trade in wild animals and plants. Permit procedures should be developed to ensure management of activities consistent with MPA objectives.

4.2.i A management plan should be prepared for each MPA and reviewed at least every five years in consultation with stakeholders. In the event of inconsistency between the MPA management plan and other planning documents (coastal plans, sectoral plans), the former should prevail.

4.3 Develop integrated approaches to marine and coastal management

About a third of sharks in the Mediterranean are threatened or potentially threatened by human activities leading to pollution, disturbance and habitat loss, particularly in the coastal zone. Pollution can contaminate food sources, concentrating in animals at the top of the food chain and potentially affecting physiology and functioning. Threats to sharks include collisions with boats, entanglement in fishing gear, marine litter and habitat degradation due to dredging, gravel extraction and dumping of waste or rubble.

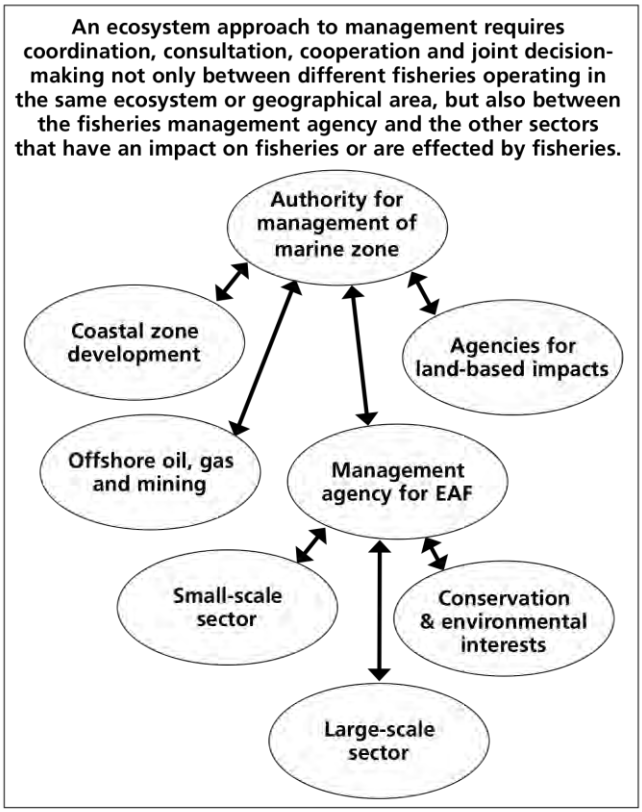
Legal frameworks thus need to go beyond species- and area-based measures to address processes and activities that affect the quality of marine and coastal ecosystems on which the fish depend. This kind of holistic approach is already strongly endorsed at the global and regional levels:

- the UN-FAO Code of Conduct for Responsible Fisheries calls on States to ensure that their fisheries interests, including the need for conservation of the resources, are taken into account in the multiple uses of the coastal zone and are integrated into coastal area management, planning and development (section 6.9: see Figure 3);

- the UN General Assembly has urged all States to implement the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities[51] and to accelerate activity to safeguard the marine ecosystem, including fish stocks, against pollution and physical degradation;

- the Barcelona Protocol (art.3.4) mandates Parties to integrate strategies, plans and programmes for conservation of biodiversity and sustainable use of marine and coastal biological resources into relevant sectoral and cross-sectoral policies.

Figure 3 Institutional coordination to support an ecosystem approach to management



Source: UN-FAO 2005 *Putting into practice the ecosystem approach to fisheries*

[51] See UNGA Resolution 62/177 (2007), §103 and http://www.gpa.unep.org/.

The new Protocol on Integrated Coastal Zone Management in the Mediterranean[52] is the first legally binding ICZM instrument in the world. It defines ICZM as:

> *"a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts" (Art. 2.f)*

The Protocol requires Parties to establish a common framework for ICZM in the Mediterranean, up to the limit of their territorial sea and to strengthen regional cooperation for this purpose.

4.3.a States should develop policies for the marine and coastal environment based on ecologically sustainable development and integrated management of activities and resources in estuarine, coastal and marine areas. Policies and implementation measures should:

- ⇒ ensure that the coastal and maritime economy is adapted to the fragile nature of coastal zones and that resources of the sea are protected from pollution;
- ⇒ promote the protection of marine areas hosting habitats and species of scientific interest through appropriate planning and/or management, irrespective of their legal status;
- ⇒ promote regional and international cooperation for the implementation of common programmes for the protection of marine habitats;
- ⇒ take into account the need to protect fishing areas in coastal development projects;
- ⇒ ensure that fishing practices are compatible with sustainable use of other marine resources;
- ⇒ build in consultation and participation procedures with the public and stakeholders.

4.3.b The most appropriate mechanism for coordination between different authorities responsible at sea and on land will vary from one country to another. Depending on existing arrangements for governance, options range from an informal committee of key agencies and stakeholders, which can be established without the need for special legislation, to the creation of a special statutory authority.

4.4 Regulate and manage ecologically damaging processes

The Barcelona Protocol requires Parties to:

- identify and monitor processes and categories of activities which have or are likely to have a significant adverse impact on the conservation and sustainable use of biodiversity (Art.3.5); and

- provide for environmental impact assessment (EIA) procedures in the planning process leading to decisions on industrial and other projects and activities that could significantly affect protected areas and species and their habitats (Art.17).

[52] The ICZM Protocol to the revised Barcelona Convention was signed in Madrid, 21 January 2008 (not yet in force) and may be downloaded from http://www.pap-thecoastcentre.org/.

These obligations apply both to marine and terrestrial activities that affect interests protected under the Protocol.

4.4.a National frameworks should provide for regulation or management of activities that are potentially damaging to marine species, habitats and ecosystems. Activities that could threaten strictly protected species or their habitats should be prohibited without a permit.

4.4.b States should put in place EIA procedures for public and private projects likely to have significant environmental effects on marine and coastal ecosystems, including designated critical habitats. The EIA should take into consideration the specific sensitivity of the environment and the inter-relationships between the marine and terrestrial parts of the coastal zone[53].

4.4.c States should also provide for strategic environmental assessment of plans and programmes affecting the marine and coastal zone[54], including offshore development (e.g. gas and oil exploitation).

4.4.d Where plans, programmes and projects are likely to have a significant adverse effect on the marine or coastal zones of other States, the States should cooperate in assessing their environmental impacts by means of notification, exchange of information and consultation before any decision on authorisation or approval is made[55].

4.4.e EIA procedures should be conducted in an open and transparent way and the participation of the public, conservation organisations and other stakeholders should be promoted.

4.4.f EIA regulations should clearly specify the following matters:

- ⇒ when an EIA is required (project type; size/cost threshold);
- ⇒ the information and analysis it should contain (direct and indirect impacts, short- and long-term, possible cumulative effect, areas of uncertainty, possible alternatives to mitigate or compensate for anticipated impacts);
- ⇒ who should carry out the EIA (where possible, this should be an independent and qualified EIA practitioner, and not the project proponent);
- ⇒ which agency or institution should review the EIA during the decision-making process;
- ⇒ circumstances in which a public enquiry may be required;
- ⇒ criteria for determining whether a permit should be granted;
- ⇒ who should bear the costs of the EIA and associated procedures.

[53] Based on Art.19.1 of the ICZM Protocol (2008).

[54] *Ibid.* Art.19.2.

[55] Consistent with the FAO Code of Conduct for Responsible Fisheries (§10.3.2) and Art.29.1, ICZM Protocol.

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Annex A
International instruments for conservation of marine biodiversity

A.1 Global instruments

A.1.1 Convention on International Trade in Endangered Species of Wild Fauna and Flora

Adopted 3 March 1973, in force 1 July 1975 (see further http://www.cites.org/)

CITES provides the legal framework for the prevention of international trade in endangered species of wild fauna and flora (Appendix I: species threatened with extinction for which international trade may only be permitted in exceptional circumstances) and for the effective regulation of international trade in other species to avoid their over-exploitation (Appendix II: species not necessarily threatened with extinction, but in which international trade must be controlled in order to avoid utilization incompatible with their survival). Appendix III lists species protected in at least one country, which has asked other CITES Parties for assistance in controlling international trade.

The CITES COP first addressed trade-related threats to sharks in 1994 when sharks were not specifically managed by any multilateral agreement for fisheries management. Resolution 9.17 on the Biological and Trade Status of Sharks requested UN-FAO and international fisheries management organisations to establish programmes to collect necessary data on shark species, and called on all nations using and trading specimens of shark species to cooperate with them for this purpose.

Since then, the COP has repeatedly expressed concern that insufficient progress has been made in achieving shark management through implementation of IPOA-Sharks; that development and implementation of national Shark Plans is inadequate; and that the continued significant trade in sharks and their products is not sustainable.

CITES measures applicable to sharks in the Mediterranean include the listing of *Pristis pectinata* and *Pristis pristis* in Appendix I (effective 13/09/07) and *Cetorhinus maximus* and *Carcharodon carcharias* in Appendix II (effective 13/02/03 and 12/01/05 respectively). In 2007, proposals to add porbeagle *Lamna nasus* and spiny dogfish *Squalus acanthias* to Appendix II were defeated at COP14 (3-15 June 2007, The Hague, Netherlands).

The CITES COP has also adopted recommendations for sustainable management of particular shark species which have been taken into account in developing these Guidelines[56]. These include:

- Resolution Conf.12.6 on the Conservation and Management of Sharks which affirms that lack of progress in IPOA-Sharks development does not justify a lack of further substantive action on shark trade issues within the CITES forum and urges UN-FAO to take steps to actively encourage relevant States to develop national Shark Plans.

- Decision 13.42 which encourages Parties to improve data collection and reporting of catches, landings and trade in sharks (at species level where possible); to build capacity to manage their shark fisheries; and to take action on species-specific recommendations developed by the Animals Committee (see 3.2.2 and Annex C).

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[56] For more information, see the *Report of activities related to sharks undertaken by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)* submitted to the CMS meeting to identify and elaborate an option for international cooperation on migratory sharks under CMS (UNEP/CMS/MS/Inf/12, available on http://www.cms.int/bodies/meetings/regional/sharks/shark_meeting.htm).

The CITES Animals Committee assesses information provided by range States to refine the list of shark species of concern, in collaboration with UN-FAO, and makes species-specific recommendations at COP meetings on improving the conservation status of sharks and regulating international trade in these species.

The 2007-2010 CITES Programme of Work encourages Parties, when considering or developing proposals to include shark species in the CITES Appendices, to consider factors affecting implementation and effectiveness, in particular:

- non-detriment findings for commercially-traded marine species (including situations involving target and bycatch fisheries) and for shared stocks, migratory species and introductions from the sea;
- monitoring and enforcement practicalities, given that sharks are generally traded in parts (meat, fins, cartilage, etc.); and
- the likely effectiveness of listing, particularly when bycatch fisheries or non-fishery anthropogenic issues are involved.

The Programme of Work also includes measures related to commodity codes, species-specific reviews, capacity-building, implementation of IPOA-Sharks and illegal fishing.

The CITES Secretariat has signed Memoranda of Understanding to strengthen cooperation and synergy with the CMS Secretariat (2002) and UN-FAO (2007).

With the recent listing of some highly migratory species under CITES, and given that taking may occur on the high seas, work in progress is focused on reaching agreement on implementing provisions on introduction from the sea (see Conf.14.6). Issues under consideration include the making of non-detriment findings for species caught beyond national jurisdiction; respective responsibilities of Flag States and Port States; the handling of transhipments in high seas; and the clarification of key definitions to make these provisions enforceable.

A.1.2 Convention on the Conservation of Migratory Species of Wild Animals

Adopted 23 June 1979, in force 1 November 1983 (see further http://www.cms.int/)

CMS provides a global framework within which Parties must take appropriate action, individually and in cooperation, to conserve migratory species and their habitats and to avoid any migratory species becoming endangered. Five shark species occurring in the Mediterranean are now listed either under both Appendices to the Convention (*Carcharodon carcharias*, *Cetorhinus maximus*) or in Appendix II (*Isurus oxyrinchus*, *Lamna nasus, Squalus acanthias*, added in 2008):

- **Appendix I (Endangered migratory species)**: Parties that are Range States of a listed species must adopt strict protection measures including: a prohibition on “taking”, broadly defined to include hunting, fishing, capturing, harassing and deliberate killing; conservation and, where feasible, restoration of habitats important for these species; measures to prevent or minimise the adverse effects of activities or obstacles that seriously impede or prevent their migration; and prevention or control of other factors that might endanger them (Art.III);

- **Appendix II (Migratory species with an unfavourable conservation status that need or would significantly benefit from international cooperation)**: Range States (whether or not they are CMS Parties) are encouraged to conclude global or regional Agreements for their conservation and management (Art. IV)[57].

In 2005, the CMS COP agreed to develop a global agreement for listed migratory sharks to enable them (and potentially other shark species) to benefit from conservation measures delivered through CMS in cooperation with RFMOs already engaged in shark conservation and management. Recommendation 8.16 also called on Parties to strengthen measures to protect migratory shark species against threatening processes, including habitat destruction, IUU fishing and fisheries bycatch.[58]

Two CMS meetings have now been held to develop a mechanism for international cooperation for migratory sharks (Mahe, Seychelles, 11-13 December 2007; Rome, 6-8 December 2008). The proposed agreement will probably take the form of a non-binding Memorandum of Understanding and Action Plan adopted under Article IV of the CMS treaty. The draft text (negotiations are due to be concluded at a meeting in the Philippines in 2009) will cover the three shark species listed in Appendix I. However, Range states are currently divided on whether the four species added to Appendix II in 2008 should be included.

The provisions of the future instrument are likely to include:

- conservation measures for listed species;
- engagement with the fisheries industry and RFMOs, including encouragement of shark fishing quotas, and control of bycatch;
- prohibition and control of shark finning;
- coordination of stock assessments and research;
- identification and protection of critical shark habitats and migration routes;
- capacity-building for shark management; and
- promotion and regulation of ecotourism and other non-consumptive use.

A.2 Regional instruments

A.2.1 Barcelona Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean

Adopted 10 June 1995[59], in force 12 December 1999 (see further http://www.rac-spa.org/accueil.php)

The Mediterranean Action Plan (1975) provides a regional framework for legal instruments focused on different aspects of environmental protection in the basin. These include the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean Sea (adopted 1976, revised 1995), under which the Barcelona Protocol and the new ICZM Protocol have been developed.

The Barcelona Protocol requires Parties to adopt cooperative measures to ensure the protection and conservation of species listed in two Annexes:

- Annex II (Endangered or Threatened species) lists three shark species (*Carcharodon*

[57] Under CMS, one Agreement for marine species in the Mediterranean has already been adopted (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), Monaco, November 1996).

[58] Bycatch of migratory species is specifically addressed under Resolution 6.2 and Recommendation 7.2.

[59] Replacing the 1982 Geneva Protocol (Protocol concerning Mediterranean Specially Protected Areas).

carcharias, *Cetorhinus maximus* and *Mobula mobular*). Parties must ensure their "maximum possible protection and recovery" in accordance with measures laid down in Articles 11.3 and 12. These requirements are reflected in Guideline 3.1 above.

- Annex III (Species whose Exploitation is Regulated) lists five species (*Squatina squatina, Rostroraja alba (=Raja alba*), *Isurus oxyrinchus, Lamna nasus* and *Prionace glauca*). Parties are required, in cooperation with competent international organisations, to take all appropriate measures to ensure the conservation of these species while at the same time authorising and regulating their exploitation so as to ensure and maintain their favourable state of conservation (Art.12.4).

Parties must also compile lists of endangered and threatened species in zones subject to their sovereignty or jurisdiction and accord them protected status. They must regulate and, where appropriate, prohibit activities having adverse effects on such species or their habitats, and carry out management, planning and other measures to ensure their favourable state of conservation. They should coordinate their action through bilateral or multilateral cooperation for the protection and recovery of migratory species whose range extends into the Mediterranean.

Lastly, the Protocol lays down requirements for area-based protection measures, integrated marine and coastal planning and environmental impact assessment of projects and other activities that could affect protected species and their habitats.

A.2.2 Action Plan for the Conservation of Cartilaginous Fishes in the Mediterranean Sea

Adopted 2003 (see further http://www.rac-spa.org/telechargement/PA/elasmo.pdf)

The Chondrichthyan Action Plan was developed by the UNEP Regional Activity Centre for Specially Protected Areas (UNEP RAC/SPA), in collaboration with the IUCN Centre for Mediterranean Cooperation and the IUCN SSG. It builds on international and regional instruments for conservation and management of sharks in the Mediterranean and calls for regional implementation of IPOA-Sharks.

The Action Plan takes a holistic approach to processes threatening Mediterranean chondrichthyans and sets out broad objectives (see Guideline 1.2.1 and Box 2). Specific sections address species protection, sustainable fisheries management, research, training, cooperative management, data collection and education and public awareness. Each of these components has been reflected in the development of these Guidelines.

Implementation of the Action Plan is the responsibility of the national authorities of the Contracting Parties (§36). A review of implementation must be carried out five years after its adoption (i.e. in 2008), leading if necessary to revision of the Plan itself.

A.2.3 Convention on the Conservation of European Wildlife and Natural Habitats

Adopted 19 September 1979, in force 1 June 1982
(see further http://www.coe.int/t/dg4/cultureheritage/Conventions/Bern/)

Parties to this regional convention include all European Mediterranean states, the European Community and two African Mediterranean States (Morocco, Tunisia).

The Mediterranean populations of *Cetorhinus maximus* and *Carcharodon carcharias* are listed as strictly protected animal species (Annex II). Parties must take appropriate and necessary legislative and administrative measures to ensure special protection of these species and their habitats and prohibit deliberate capture, keeping, killing, damage to or destruction of breeding or resting sites and possession of and internal trade in these animals, parts and derivatives where this would contribute to the effectiveness of this strict protection objective (Art.6).

The Mediterranean populations of *Isurus oxyrinchus, Lamna nasus, Prionace glauca, Squatina squatina* and *Raja alba* are listed as protected species of wild fauna whose exploitation must be regulated (Annex III). Measures for this purpose include: closed seasons and/or other procedures regulating exploitation; temporary or local prohibition of exploitation, as appropriate, to restore satisfactory population levels; regulation as appropriate of sale, keeping for sale, transport for sale or offering for sale of live and dead wild animals (Art.7). Parties must prohibit the use of all indiscriminate means of capture and killing and the use of all means capable of causing local disappearance of, or serious disturbance to, populations of these species (Art.8).

Parties must coordinate their efforts for the protection of Annex-listed migratory species whose range extends into their territories (Art.10.1) and ensure that measures adopted under Art.7.3a are adequate to meet the requirements of the migratory species listed in Annex III.

A Standing Committee meets annually to review implementation of the Convention, with specialist NGOs attending as observers. To date, however, it has not adopted any recommendation concerning shark conservation.

Annex B
International instruments for fisheries conservation and management

B.1 Global instruments

B.1.1 United Nations Convention on the Law of the Sea

Adopted 10 December 1982, in force 16 November 1994 (see further www.un.org/Depts/los/)

UNCLOS sets out the rights and duties of States for fisheries management and conservation, environmental protection and other legitimate uses of the sea, reflecting customary international law, and defines the legal regime for each marine jurisdictional zone.

- Within the **territorial sea** (up to a limit not exceeding 12 nautical miles measured from its baseline), a coastal State has sovereign rights over all resources, living or non-living.

- A coastal State may establish an **exclusive economic zone** (EEZ) beyond its territorial sea to a maximum of 200 nautical miles from its baseline in which it has *sovereign rights* for exploiting, conserving and managing natural resources. However, it must ensure that living resources are not endangered by over-exploitation and that populations of species associated with or dependent on harvested species are maintained above levels at which their reproduction may become seriously threatened. The State also has *jurisdiction* over scientific research and the protection and preservation of the marine environment.

- A coastal State has sovereign rights over the whole **continental shelf**, even beyond the 200 mile limit of a declared EEZ. Where the shelf does not extend as far as 200 miles (as is more usual), the coastal State has sovereign rights over the sea bed beyond the end of the continental shelf up to the 200 mile limit.

- In the **high seas,** the principle of freedom of fishing applies, subject to conservation and management rules laid down by Articles 116-120 and to other treaty obligations a State has accepted. All States must cooperate to conserve and manage living marine resources in the high seas, including associated and dependent marine species.

States bordering a semi-enclosed sea, such as the Mediterranean, are required to cooperate in exercising their rights and duties for management, conservation, exploitation and environmental protection, either directly or through an appropriate regional organisation (Art.123).

No sea point in the Mediterranean is more than 200 n.m. from the nearest land or island. Although most coastal States have established their 12-mile territorial waters[60], until recently relatively few had extended their maritime jurisdictional areas beyond the territorial sea. The resulting high proportion of high seas in the basin created an even greater need for cooperation to ensure the sustainable use of fisheries resources and conservation of marine biodiversity.

However, a trend is currently developing among coastal States to extend their maritime jurisdictional areas. If continued, this would significantly reduce the proportion of high seas in the basin. By 2006, five States had claimed an EEZ (Cyprus, Egypt, Morocco, Syria, Tunisia) and several had established *sui generis* zones beyond the limits of national jurisdiction, such as the fishing zone (Algeria, Libya, Malta, Spain, Tunisia), the ecological zone (France, Italy,

[60] Exceptions concern the United Kingdom (3 n.m. claimed for Gibraltar and the Sovereign Base Areas of Akrotiri and Dhekelia), Greece (6 n.m.) and Turkey (6 n.m. only in the Aegean Sea).

Slovenia) or the Ecological and Fisheries Zone (Croatia).[61]

UNCLOS establishes specific regimes for different categories of fish species (Fowler and Cavanagh 2005):

- „Highly migratory species' listed in Annex I include *Hexanchus griseus*, *Cetorhinus maximus*, *Alopiidae* spp., *Carcharhinidae* (including *Prionace glauca*), *Sphyrnidae* spp. and *Isuridae* (including *Isurus oxyrinchus* and *Lamna nasus*). Coastal States and other States who fish in areas where highly migratory species occur are required to cooperate with a view to ensuring the conservation and optimum utilisation of listed species both on the high seas and within EEZ (Article 64). The UN Fish Stock Agreement (see below) provides for detailed application of UNCLOS provisions to these stocks.

- „Straddling fish stocks' occur both within and beyond the EEZ and are usually more localised than highly migratory species although many, particularly in temperate waters, will undertake seasonal or breeding migrations. States are required to agree upon measures to ensure the conservation of straddling stocks in accordance with Article 63.2.

- „Transboundary stocks', which move between the EEZ of several coastal States, can also be straddling stocks although they do not always extend into the high seas. Transboundary stocks are often migratory, particularly in temperate seas.

- „High seas stocks' denotes fish stocks that are not found in EEZs and are neither „highly migratory' nor „straddling'. In accordance with UNCLOS, fishing States must individually, or in cooperation with other fishing States, take measures to ensure these stocks are conserved.

B.1.2 United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (FSA)

Adopted 5 August 1995, in force 11 December 2001 (see further www.oceanlaw.net/texts/unfsa.htm)

The FSA is an implementing agreement to promote cooperative implemention of UNCLOS provisions on straddling fish stocks and highly migratory fish stocks. It requires States to apply the precautionary approach to conservation and management of these stocks, taking into account uncertainties concerning the impact of fishing activities on non-target and associated and dependent species. They should not exceed reference points set by reference to technical criteria in Annex II to the Agreement.

States must apply an ecosystem-based approach to management and take measures to protect marine biodiversity, minimise pollution, bycatch and discards of fish, monitor fishing levels and stocks, gather reliable, comprehensive scientific data as the basis for management decisions and exercise effective control over their fishing vessels.

The FSA establishes a comprehensive regime for international cooperation mechanisms for stocks covered by the Agreement, particularly with regard to the scope and functions of regional and sub-regional fisheries management organisations or arrangements (RFMOs). States are required to cooperate to ensure proper implementation of sub-regional and regional conservation and management measures for these stocks. The FSA sets out detailed

[61] Personal communication, Professor Tullio Scovazzi.

provisions for compliance and enforcement as well as cooperative inspection activities which, for high seas areas covered by such an organisation or arrangement, are coordinated at sub-regional or regional level. It also requires States to settle disputes in a peaceful manner and establishes a dispute settlement mechanism.

B.1.3 Agreement to promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas

Adopted Rome, 23 November 1994; in force 24 April 2003 (see further http://www.fao.org/fishery/ccrf/2,2)

The UN-FAO Compliance Agreement aims to prevent non-compliance with international fisheries regulations through reflagging vessels under the flags of States unable or unwilling to enforce such measures. Fishing in the high seas should be subject to a permit from the flag State and permit conditions enforced. Sanctions for serious offences must include the refusal, suspension or withdrawal of permits.

Parties are required to maintain a register of vessels authorised to fish on the high seas and to exchange information on the activities of such vessels (Arts.V-VI). The UN-FAO compiles this information and maintains the High Seas Vessels Authorization Record (HSVAR). The HSVAR database contains descriptive elements of authorised vessels and information on additions and removals from the register, exemptions granted and infringements.

B.1.4 UN-FAO Code of Conduct for Responsible Fisheries

Non-binding: adopted 31 October 1995 (see further http://www.fao.org/fishery/ccrf/2, including for versions in Albanian, Arabic, Croatian, Spanish, French, Italian and Slovenian)

This non-binding global Code is based on the principle that all States and users of fishery resources should act responsibly to ensure the effective conservation, management and development of living aquatic resources, with due respect for marine and coastal biodiversity. It is fully integrated with the Straddling Stocks and Compliance Agreements summarised above.

The Code provides a comprehensive basis for Mediterranean States to review and strengthen policy, legal and institutional measures for sustainable fisheries and marine environmental management. It specifically covers conservation of critical habitats, integration of fisheries into coastal area management, regulation of damaging processes such as pollution and the engagement with fishing communities. Selected provisions of the Code are referenced in these Guidelines.

B.1.5 UN-FAO International Plan of Action for the Conservation and Management of Sharks

Non-binding: adopted 1999 (see further http://www.fao.org/fishery/IPOA-Sharks/2)

IPOA-Sharks was developed as a voluntary instrument under the UN-FAO Code of Conduct for Responsible Fisheries. Its objective is to improve the conservation and management of sharks and their long-term sustainable use within directed and non-directed fisheries.

IPOA-Sharks applies to States in whose waters sharks are caught by vessels (their own or foreign) or whose vessels catch sharks on the high seas. It is based on the principle that States contributing to fishing mortality on a species or stock should participate in its management and sets out recommendations for such States, including the production of national Shark Plans. Relevant provisions are reflected in these Guidelines.

UN-FAO has issued technical guidelines to support IPOA-Sharks implementation (UN-FAO

2000). This provides detailed guidance on fishery management data and research and on fisheries management and species conservation.

Despite repeated urging at international level, implementation of IPOA-Sharks at global and Mediterranean level is agreed to be quite inadequate. UN-FAO held an expert consultation in 2005[62] which found that IPOA-Sharks was well accepted at national political and policy levels but that there seemed to be confusion about what was needed to implement a wholly voluntary instrument. Concrete operational activities were "meagre and unsatisfactory". Notwithstanding these difficulties, the experts considered IPOA-Sharks to be a beneficial endeavour. Constraints on implementation were reviewed and suggestions made to improve its effectiveness.

By March 2007, less than 20% of COFI (UN-FAO) members had adopted a national Shark Plan. The UN General Assembly has repeatedly urged full implementation of IPOA-Sharks. En 2008[63], it called on States to take immediate and concerted action for this purpose and to improve the implementation of and compliance with existing RFMO and national measures that regulate shark fisheries, especially those conducted solely for the purpose of harvesting shark fins, and to consider taking other measures (e.g. requiring that all sharks be landed with each fin naturally atttached). The UNGA also requested the UN-FAO to prepare a report containing a comprehensive analysis of IPOA-Sharks implementation for presentation to the COFI at its 28th session in 2009.

Within the Mediterranean, the only regional initiative to apply IPOA-Sharks is the RAC/SPA Chondrichthyan Action Plan but this does not go into details on technical fisheries measures. At EC level, a Community Plan of Action on Sharks is under development (see B.2.3).

B.2 Regional fisheries organisations

Regional fisheries management organisations (RFMOs) are intergovernmental organisations that have competence to establish fisheries conservation and management measures. Two RFMOs have management responsibilities for defined waters/fish stocks in the Mediterranean (GFCM and ICCAT). In addition, the European Community is a regional economic integration organisation to which its member States have transferred exclusive competence with regard to marine fisheries.

B.2.1 General Fisheries Commission for the Mediterranean

Established by formal agreement adopted in 1949, into force 1952 : reformed with extended mandate in 1998 (see further http://www.gfcm.org/gfcm)

GFCM's goal is to promote the development, conservation, rational management and best utilisation of living marine resources of the Mediterranean. It covers all fisheries and provides a forum for multilateral cooperation between all countries whose vessels fish in these waters.

The GFCM develops resolutions and recommendations consistent with UN-FAO technical measures and the Code of Conduct for Responsible Fisheries. Members must transpose relevant requirements into national policy, legal or institutional frameworks as appropriate.

The GFCM has not prioritised sharks to date or developed coordinated measures for regional implementation of IPOA-Sharks. However, it has endorsed all relevant ICCAT

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62 See FAO Fisheries Report No. 795: ftp://ftp.fao.org/docrep/fao/009/a0523e/a0523e00.pdf.

63 United Nations General Assembly Resolution (63-112 of 5 December 2008) on *Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments*

recommendations (e.g. on shark bycatch in pelagic tuna fisheries) and supports the MEDLEM (Mediterranean Large Elasmobranchs Monitoring) programme set up in 1985. This programme records captures and sightings of large cartilaginous fishes and its field data sheet has been widely distributed among many Mediterranean research centres.[64]

The GFCM Sub-Committee on Marine Environment and Ecosystems (established under the Scientific Advisory Committee) supports collaboration with partner organisations on discards and bycatch of species of conservation concern. In 2008, a transversal Working Group on bycatch/incidental catches was established. Its work plan for 2009 will pursue the work on population dynamics of protected species of conservation concern (including basking and great white sharks) and the elaboration of a data collection protocol on bycatch of such species, harmonised with existing similar initiatives (eg under MedLem).

Other relevant Working Groups have been created on Selectivity and on Recreational Fisheries[65]. In 2009, a Transversal Workshop on Selectivity Improvement and Bycatch Reduction will be organised to address definitions of relevant terms and concepts, current status of bycatch and discard related to Mediterranean fisheries, review of methods for assessing bycatch and its impact at the population level and possible integration of information on bycatch into the GFCM Task 1 database.

Some general GFCM recommendations contribute to reducing fishing pressure on sharks and to enhanced compliance with fisheries regulations, including:

- the prohibition on use of towed dredges and trawlnets fisheries at depths beyond 1,000m[66];
- the prohibition on use of large driftnets for fisheries of large pelagics in the Mediterranean[67];
- recommendations on illegal, unreported and unregulated (IUU) fishing, including on the establishment of a black list of vessels.[68]
- prohibition of destructive fishing practices in sensitive habitats[69];
- the introduction of a Regional Scheme on Port State Measures to combat INN fishing in the GFCM area[70], which establishes detailed procedures for: designation of ports for entry by foreign vessels; authorisation or refusal of access to ports; port inspection; verification of INN fishing; and contribution to a regional information system to better monitor and control the GFCM Area.

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[64] The database (dominated by records of basking shark) is held by the information structures of ARPAT in Livorno, Italy (http://www.arpat.toscana.it/progetti/pr_medlem_en.html). It corresponds to the following families: *Hexanchidae, Sphyrnidae, Echinorhinidae, Squatinidae, Pristidae, Rhinobatidae, Raijdae, Dasyatidae, Gymnuridae, Carcharhinidae, Myliobatidae, Rhinopteridae, Mobulidae, Odontaspididae, Alopiidae, Cetorhinidae* and *Lamnidae*.

[65] See Gaudin and de Young 2007 and Guideline 3.6 above.

[66] Recommendation GFCM/2005/1 on the management of certain fisheries exploiting demersal and deepwater species deepwater fisheries.

[67] GFCM/2005/3 (a) endorsing ICCAT Recommendation [03-04] relating to Mediterranean Swordfish.

[68] Recommendation GFCM/2006/4 : Establishment of a list of vessels presumed to have carried out illegal, unreported and unregulated fishing activities in the GFCM Area.

[69] Recommendation GFCM/2006/3: Establishment of fisheries restricted areas in order to protect the deep sea sensitive habitats.

[70] Recommendation GFCM/2008/1, aligned with the draft Agreement on Port State measures under development within UN-FAO

B.2.2 International Commission for the Conservation of Atlantic Tunas

Established under the International Convention for the Conservation of Atlantic Tunas, adopted 1966, in force 1969 (see further http://www.iccat.int).

The ICCAT has responsibility for tuna and tuna-like fisheries for the Atlantic, including the Mediterranean as a connected sea. Mediterranean Parties include Algeria, the European Community, Libya, Morocco, Tunisia and Turkey.

ICCAT undertakes collection and analysis of statistical information on conditions and trends of target fishery resources. It recognises that many shark species are captured in Convention area fisheries and compiles data for fish species caught as bycatch that are not investigated by another international fishery organisation. The ICCAT Manual[71] currently identifies 3 sharks (*Prionace glauca, Lamna nasus, Isurus oxyrinchus*) as „bycatch species of special importance' and gives taxonomic, identification, distribution and fisheries information.

Scientific advice is provided by the Standing Committee for Research and Statistics (SCRS) which develops scientific guidance and conducts stock assessments, including for some shark species, to support development of conservation and management advice. A GFCM/ICCAT Joint Working Group on Stocks of Large Pelagic Fishes meets on an *ad hoc* basis to promote institutional synergy.

A series of decisions on bycatch[72] all call for improved data reporting on catch, effort by gear type, discards of sharks, landings and trade in shark products. Recommendation 2004-10 called for full utilisation of shark carcasses, restrictions on finning, release of live shark bycatch, especially juveniles and research into more selective fishing gear. However, data provision has remained grossly inadequate, hampering stock assessment[73].

Recommendation 07-06, updating 04-10, marked a shift towards binding restrictions although it does not set any quota for shark catches in the Convention Area. It requires Contracting Parties, Cooperating non-Contracting Parties, Entities or Fishing Entities (CPCs):

- to submit Task I[74] and Task II[75] data for catches of sharks (including estimates of dead discards and size frequencies), as required by ICCAT data reporting procedures in advance of the next SCRS assessment;

- to take appropriate measures to reduce fishing mortality in fisheries targeting *Lamna nasus* and *Isurus oxyrinchus* until such time as sustainable levels of harvest can be determined through peer reviewed stock assessments by SCRS or other organisations;

- where possible, to implement research on pelagic shark species caught in the Convention area in order to identify potential nursery areas and to consider time and area closures and other measures, as appropriate.

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71 http://www.iccat.int/pubs_FieldManual.htm.

72 Resolution 95-02; Resolution 01-11; Resolution 03-10; Recommendation 04-10: Recommendation concerning the conservation of sharks caught in association with fisheries managed by ICCAT; and three Supplemental recommendations to 04-10 (05-05, 06-10 and 07-06).

73 The 2006-07 ICCAT Biennial Report noted *"the very low level of compliance with the obligations of the CPCs to provide Task I and Task II data for sharks caught by their vessels, greatly hampering, when not completely impeding, the assessment of the status of exploited sharks"*.

74 Nominal annual catch by species, region, gear, flag, and where possible, separated between EEZ and High Seas.

75 Catch and fishing effort statistics for each species by small area, gear, flag and month.

Two recommendations adopted at the most recent meeting in 2008 address sharks:

- under Recommendation 08-07, CPCs shall require vessels flying their flag to promptly release unharmed, to the extent practicable, bigeye thresher sharks (*Alopias superciliosus)* caught in association with fisheries managed by ICCAT which are alive when brought along side for taking on board the vessel. CPCs shall also require incidental catches as well as live releases to be recorded in accordance with ICCAT data reporting requirements.

- Recommendation 08-08 provides for a joint ICCAT-ICES scientific meeting in 2009 to further assess *Lamna nasus*, followed by a joint meeting of relevant RFMOs to examine possible adoption of compatible management measures in 2009 throughout its range in the Atlantic Ocean.

An independent review of ICCAT implementation (Hurry et al, September 2008) found that endemic levels of non-reporting and non-compliance with existing recommendations and resolutions meant that such measures were not dealing effectively with the management of shark fisheries and shark by-catch. The Review Panel was concerned that the present situation implied contempt for ICCAT decisions by some parties. It called on CPCs to immediately take the management of shark fisheries and shark by-catch seriously and implement and comply with ICCAT recommendations and resolutions to provide accurate and reliable data to the SCRS. It encouraged further use of expert groups to develop alternative catch estimate and assessment approaches for the major shark species under the purview of ICCAT.

ICCAT has also adopted measures to prevent or minimise IUU fishing and to establish a Regional Observer Programme to monitor transhipment (2008).

B.2.3 European Community

The European Community (EC) has exclusive competence for fisheries management and conservation within Community waters. For other waters, it negotiates on behalf of the Member States in international fora and monitors their implementation of applicable rules. The EC is party to several agreements establishing RFMOs, including GFCM and ICCAT, and takes the necessary regulatory measures to incorporate binding management recommendations into the Community legal order.
Mediterranean States that are EU Member States must transpose EC regulatory measures into national legal frameworks.

Sharks are living aquatic resources that fall within the domain of the Common Fishery Policy (CFP). Pending possible changes to Community legislation (see below), the existing legal framework provide broadly as follows:

- regulations cover mesh sizes and permitted fishing gear for capture of *Rajidae, Scyliorhinidae*, *Squalus acanthias* and *Scyliorhinus* spp.[76];

- drift nets have been prohibited since 2002 (see Guideline 3.4);

- shark finning was prohibited in 2003[77] with regard to all types of fishing in Community waters and to all Community vessels fishing in non-Community waters. Under this

[76] Council Regulation (EC) No 850/984 as amended.
[77] Council Regulation (EC) 1185/2003 of 26 June 2003.

measure, it is legal to remove the fins from sharks at sea, under special permit, but the carcasses must be retained on board and the weight of the fins is therefore not allowed to exceed the theoretical weight of the fins that would correspond to the remaining parts of sharks retained on board, transhipped or landed (in no case shall the theoretical weight of the fins exceed 5 % of the live weight of the shark catch);

- since 2007, as part of measures to support the conservation of certain highly migratory stocks and reduce bycatch, the catching, retaining on board, transhipment or landing of *Cetorhinus maximus* and *Carcharodon carcharias* in all Community and non- Community waters have been prohibited. Member States must encourage the release of live sharks captured accidentally, especially juveniles, and reduce discards of sharks by improving the selectivity of fishing gears[78];

- catch limits are set for some shark species as part of the TACs and quotas set by the EU for Community waters (e.g. *Squalus acanthias*, *Lamna nasus*, several species of skates and rays) and for deepwater sharks in certain waters. The EU is committed to reducing the TAC for deepwater sharks to zero by 2010[79].

In 2007, the EC institutions, recognising that the range of existing measures was insufficient to ensure the rebuilding of many depleted shark stocks, launched stakeholder consultations to develop an action plan to strengthen the existing framework[80].

In February 2009, the European Commission published a Communication, *On a European Community Action Plan for the Conservation and Management of Sharks*[81]. This recognises that shark fisheries are not subject to a comprehensive management framework at Community level and proposes to develop and implement a comprehensive, effective and integrated policy and regulatory framework.

The Community Plan of Action aims to contribute to the general objective of IPOA-Sharks by ensuring the rebuilding of many depleted stocks. It covers directed commercial, by-catch commercial, directed recreational and by-catch recreational fishing of any sharks within Community waters; any fisheries covered by current and potential agreements and partnerships between the EC and third countries; fisheries in the high seas; and fisheries covered by RFMOs managing or issuing non-binding recommendations outside Community waters.

The Plan is based on three guiding principles: a gradual strategy based on sound scientific evidence; regional cooperation; and an integrated framework of actions. It proposes measures to be implemented at EC and Member State level, for which the EC will seek endorsement by relevant RFMOs. These include measures to: strengthen investment in species-specific data collection, improve monitoring and stock assessment as a basis for better targeted regulations; strengthen on-board observer programmes; and, as regards fisheries management, to:

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[78] Council Regulation (EC) No 520/2007 of 7 May 2007 which sets out a list of highly migratory sharks (Annex 1) including *Hexanchus griseus, Cetorhinus maximus, Alopiidae Rhincodon typus, Carcharhinide, Sphyrnidae, Isuridae* and *Lamnidae*.

[79] For 2007 and 2008, fishing for deep water species was regulated under Council Regulation (EC) No 2015/2006 of 19 December 2006 which defines deep-sea sharks to include *Apristuris spp.; Centrophorus granulosus; Centrophorus squamosus; Centroscymnus coelolepis; Centroscymnus crepidater; Deania calceus; Centroscyllium fabricii; Dalatias licha, Etmopterus princeps, Etmopterus spinax, Galeus melastomus, Galeus murinus* and *Somniosus microcephalus.*

[80] The legal basis for this Plan is Council Regulation (EC) N°2371/2002 of 20 December 2002 (see further http://ec.europa.eu/fisheries/).

[81] Communication from the Communication to the European Parliament and the Council (COM(2009) 40 final, Brussels, 5.2.2009).

- promote programmes and analysis to adjust fishing effort at international level and establish catch limits for stocks in conformity with the advice provided by ICES and by relevant RFMOs;

- prohibit all shark discards in the medium to long term and require that all catches (including by-catches) are landed. Unwanted by-catches of sharks that have a chance to survive must be released back into the water;

- improve selectivity and establish by-catch reduction programmes for shark species considered CR or EN by relevant international organisations;

- confirm and strengthen control of the EU ban on shark finning practices. The Plan provides for a possible review of the 5% rule by requiring that in no case shall the weight of the fins exceed 5% of the dressed (gutted and beheaded) carcass weight of the shark[82];

- introduce the requirement, for vessels of Member States that have been exempt from the obligation of landing sharks with fins attached, to land shark fins and carcasses at the same time in the same port; and

- support development and implementation by RFMOs of Regional Shark Plans.

[82] However, Member States that have set up and implemented data collection programmes that show that this percentage could be increased in certain cases, could do so up to a percentage corresponding to 5% of the live weight of the shark catch.

Annex C
Legal and threat status for chondrichthyans in the Mediterranean

Scientific name	Common name	Red List 2007	Instruments mandating strict protection or special management
Oxynotus centrina	Angular roughshark	CR	
Squatina aculeata	Sawback angelshark	CR	CITES (AC)
Squatina oculata	Smoothback angelshark	CR	CITES (AC)
Squatina squatina	Angelshark	CR	CITES (AC); Barcelona Protocol (III); Bern (III)
Pristis pectinata	Smalltooth sawfish	CR	CITES (I); CITES (AC); Action Plan
Pristis pristis	Common sawfish	CR	CITES (I); CITES (AC); Action Plan
Dipturus batis	Common/gray skate	CR	Action Plan
Leucoraja melitensis	Maltese skate	CR (endemic)	
Rostroraja alba	White skate	CR	Barcelona Protocol (III); Bern (III)
Gymnura altavela	Spiny butterfly ray	CR	
Carcharias taurus	Sand tiger shark	CR	CITES (AC); Action Plan; UNCLOS (I)
Isurus oxyrinchus	Shortfin mako	CR	CMS (II, added in 2008); Barcelona Protocol (III); Bern (III); UNCLOS (I); GFCM PS (Shared stock for all countries in the Mediterranean); ICCAT (bycatch species of special importance: 07-06 calls for reduction of fishing mortality)
Lamna nasus	Porbeagle shark	CR	CMS (II, added in 2008); CITES (AC); Barcelona Protocol (III); Bern (III); UNCLOS (I); GFCM PS (Shared stock for all countries in the Mediterranean); ICCAT bycatch species of special importance: 07-06 calls for reduction of fishing mortality); European Community catch limit
Squalus acanthias	Spiny dogfish	EN	CMS (II: northern hemisphere populations, added in 2008); CITES (AC); UNCLOS (I); European Community catch limit
Rhinobatos cemiculus	Blackchin guitarfish	EN	CITES (AC)
Rhinobatos rhinobatos	Common guitarfish	EN	CITES (AC)
Leucoraja circularis	Sandy skate	EN	
Mobula mobular	Giant devil ray	EN (endemic)	CITES (AC); Barcelona Protocol (II); Bern (II)
Odontaspis ferox	Smalltooth sand tiger shark	EN	CITES (AC); Action Plan
Carcharodon carcharias	Great white shark	EN	CMS (I & II); CITES (II); Barcelona Protocol (II); Bern (II); UNCLOS (I); fishing prohibited in EC waters or by EC-flagged vessels
Carcharhinus plumbeus	Sandbar shark	EN	UNCLOS (I)

Heptranchias perlo	Sharpnose sevengill shark	VU	
Centrophorus granulosus	Gulper shark	VU	CITES (AC)
Alopias vulpinus	Thresher shark	VU	CITES (AC); UNCLOS (I)
Cetorhinus maximus	Basking shark	VU	CMS (I & II); CITES (II); Barcelona Protocol (II); Bern (II); UNCLOS (I); fishing prohibited in EC waters or by Community-flagged vessels.
Galeorhinus galeus	Tope shark	VU	CITES (AC)
Mustelus asterias	Starry smoothhound	VU	
Mustelus mustelus	Smoothhound	VU	
Prionace glauca	Blue shark	VU	Barcelona Protocol (III); Bern (III); UNCLOS (I); GFCM PS (Shared stock for all countries in the Mediterranean)
Sphyrna zygaena	Smooth hammerhead	VU	UNCLOS (I)
NT			
Chimaera monstrosa	Rabbitfish	NT	
Hexanchus griseus	Bluntnose sixgill shark	NT	UNCLOS (I)
Dipturus oxyrhynchus	Sharpnose skate	NT	
Leucoraja naevus	Cuckoo skate	NT	
Raja clavata	Thornback skate	NT	
Raja polystigma	Speckled skate	NT	
Dasyatis centroura	Roughtail stingray	NT	
Dasyatis pastinaca	Common stingray	NT	
Pteroplatytrygon violacea	Pelagic stingray	NT	
Myliobatis aquila	Common eagle ray	NT	
Rhinoptera marginata	Lusitanian cownose ray	NT	
Galeus atlanticus	Atlantic catshark	NT	
Scyliorhinus stellaris	Nursehound	NT	
Etmopterus spinax	Velvet belly	LC	
Centroscymnus coelolepis	Portuguese dogfish	LC	

Somniosus rostratus	Little sleeper shark	LC	
Torpedo marmorata	Spotted torpedo ray	LC	
Torpedo torpedo	Ocellate torpedo ray	LC	
Raja asterias	Atlantic starry skate	LC	
Raja miraletus	Twineye skate	LC	
Raja montagui	Spotted skate	LC	
Galeus melastomus	Blackmouth catshark	LC	
Scyliorhinus canicula	Smallspotted catshark	LC	
Hexanchus nakamurai	Bigeye sixgill shark	DD	
Echinorhinus brucus	Bramble shark	DD	
Dalatias licha	Kitefin shark	DD	
Torpedo nobiliana	Great torpedo ray	DD	
Leucoraja fullonica	Shagreen skate	DD	
Raja brachyura	Blonde skate	DD	
Raja radula	Rough skate	DD (endemic)	
Raja undulata	Undulate skate	DD	
Dasyatis chrysonota	Blue stingray	DD	
Himantura uarnak	Honeycomb whipray	DD	
Taeniura grabata	Round fantail stingray	DD	
Alopias superciliosus	Bigeye thresher	DD	CITES (AC); UNCLOS (I)
Mustelus punctulatus	Blackspot smoothhound	DD	
Carcharhinus altimus	Bignose shark	DD	CITES (AC); UNCLOS (I)
Carcharhinus brachyurus	Bronze whaler shark	DD	CITES (AC); UNCLOS (I)
Carcharhinus brevipinna	Spinner shark	DD	CITES (AC); UNCLOS (I)
Carcharhinus limbatus	Blacktip shark	DD	CITES (AC); UNCLOS (I)
Carcharhinus obscurus	Dusky shark	DD	CITES (AC); UNCLOS (I)
Abbreviation	Legal status		

CITES (I)	Appendix I: species threatened with extinction for which international trade may only be permitted in exceptional circumstances
CITES (II)	Appendix II: species not necessarily threatened with extinction, but in which international trade must be controlled in order to avoid utilisation incompatible with their survival
CITES (AC)	Species for which States should take action under recommendations developed by CITES Animals Committee (see CITES Decision 13.24 and Guideline 3.2.2).
CMS (I)	Endangered migratory species, for which strict protection is mandated (including prohibition on deliberate taking)
CMS (II)	Migratory species with an unfavourable conservation status that need or would significantly benefit from international cooperation
Barcelona Protocol (II)	Endangered and Threatened Species for which strict protection is mandated (including prohibition/regulation of deliberate taking)
Barcelona Protocol (III)	Species whose Exploitation is Regulated (to „ensure and maintain their favourable state of conservation'
Action Plan	Species of commercial importance for which development of sustainable fisheries management measures should be prioritised (Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea)
Bern (II)	Strictly protected animal species (includes prohibition on deliberate killing)
Bern (III)	Protected species whose exploitation must be regulated
UNCLOS (I)	Highly migratory species listed in Annex I and covered by Art.64 UNCLOS
GFCM PS	Priority species considered of interest in GFCM Region (listed by Scientific Advisory Committee, 2006). criteria for determining „interest' based on the volume of landings and economic importance of the species (*Sub-Committee on Stock Assessment)*
ICCAT 07-06	Species covered by specific stock assessment and mortality reduction recommendation

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

The following table summarises the answers provided to a short questionnaire circulated in March 2008, and further updated in April 2009, asking Parties to the Barcelona Convention to provide a brief update on steps taken at national level to implement the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea (UNEP-MAP RAC/SPA, 2003). The European Community was not directly consulted because information on existing measures had been recently published through the ongoing consultation process to develop a Community Plan of Action on Sharks.

Country	Species protection status (name of legal instrument and competent ministry)?	Progress on data deficient species?	Regulation of shark finning?	Habitat protection/MPAs to support shark conservation?	Coverage of sharks in fisheries management programmes?	Monitoring of shark fisheries and bycatch?	Education and public awareness?
Albania							
Algeria							
Bosnia & Herzgovina	No	No	No	No	No	No	No
Croatia	Strict protection for *Cetorhinus maximus, Carchadon carcharias Mobula mobular* (also covers trade and transport including in EEZ) under Ordinance on Proclamation of Wild Taxa as Protected or Strictly Protected (OG n°7/2006, issued by Nature Protection Directorate, Ministry of Culture).	*Raja polystigma* is still DD: the official Red list of Croatian Saltwater Fishes has not yet been issued.	Not legally regulated as "there is no problem with shark finning in Croatia".	Ordinance prohibits damage to breeding and resting sites in waters under national jurisdiction. Sharks are protected in MPAs along with other marine species but no MPA established specifically for these species.	None. Protected sharks are automatically excluded from the list of fishing species in the Marine Fisheries Act. No directed fisheries in Croatian waters but they are caught as bycatch and may also be bycaught in big game fishing.	No	No
Cyprus							
European Community	Catch, retention on board, transhipment and landing prohibited since 2007 for *Cetorhinus maximus* and *Carchadon carcharias*.		Regulation EC n°1185/2003 bans removal of fins followed by discard of	None.	Community Action Plan for Sharks published in February 2009. Some general provisions already	Covered by the Community Action Plan.	

			the carcass at sea. Finning with retention of carcasses on board is permitted in accordance with the provisions of Regulation.		contribute to reduction of bycatch (e.g. ban on driftnets, more selective fishing gear) and overfishing (eg closed seasons). The TAC for deep-sea sharks will be reduced to zero by 2010.		
Egypt							
France							
Greece	Protected species are the ones that are mentioned in CITES Convention (competent ministry – Ministry of Rural Development and Food), Bern convention and SPA – Biodiversity protocol of Barcelona Convention (competent ministry – Min. For the Environment, Physical planning and Public Works)		Regulation EC n°1185/2003 bans removal of fins followed by discard of the carcass at sea. According to the Ministry of Merchant Marine that controls the implementation of the Regulation, the national fishing fleet does not perform finning.	There are no MPAs for shark conservation.	Fisheries management programmes do not refer specifically to shark fishes because they are not commercial species. Driftnets are prohibited, contributing to reduction of bycatch .	Fisheries data including bycatch have been collected for some years under responsibility of Ministry of Rural Development and Food. In the frame of the application of Council Regulation (EC) No 199/2008 a new project for the years 2009-2010 will be procured. Research and data collection is also carried out by individual scientists.	No actions for the time being.
Israel	All Cartilaginous Fishes (Class Elasmobranchii, including Order Sellachii and Order Batoidae) are being protected from any type of harm or damage at the entire Israeli water region. This inclusive protection is given to sharks being Cartilaginous Fishes	No quantitative data and limited capacity for this taxonomic group	No (no fining activities).	Currently, all organisms are declared protected within the borders of Israeli marine nature reserves (6) and Marine Protected Areas (2 "Mediterranean Sea Reserves"). Commercial fishing of any species or other harmful activities is forbidden at those areas. Critical areas for sharks were not	Sharks should not be fished under any occasion, and therefore are not included in any management plan.	No	Not on a regular bases. The issue is being widely exposed and discussed by the Media upon targeted hunting of

	declared as a protected natural value (2005 declaration within the legislative framework of National Parks, Nature Reserves and National Monuments 1998 – The Ministry of Environmental Protection).			determined yet, and there is no specific declaration of MPAs for the sake of sharks conservation.			Cartilaginous fishes or massive by catch. Protective legislation is presented to the public on these occasions.
Italy	Applies to species listed for strict protection under Barcelona Protocol, Bern Convention and in CITES Appendices.	Data lacking for *Sphyrna* spp. and *Rhinobatos* spp. Stock assessment under way for *R. polystigma* based on data from trawl surveys	No finning permits have been granted pursuant to EC Regulation n°1185/2003	No legal protection for critical habitats though these have been identified for some species (mating, spawning and nursery grounds for *Raja asterias*, *Scyliorhinus canicula*, *Galeus melastomus*, *Etmopterus spinax*, etc.). The trilateral Pelagos Sanctuary could have benefits for pelagic sharks.	Pending. The final report for an Italian Action Plan was produced mid 2007 by ICRAM with the support of the Ministry of the Environment and Sea (MATTM).	Yes, through MEDITS, GRUND (assessment of demersal resources in N.Thyrrenian/ Ligurian Seas, and MEDLEM.	Some initiatives targeted at public, students and other stakeholders but no overall EPA plan.
Lebanon	No	No	No	No	No	No	No
Libya							
Malta	Strict protection for *Carcharodon carcharias* *Cetorhinus maximus* *Mobula mobular* (Sch.VI).14 species listed in Sch.VIII (species of national interest whose taking in the wild and exploitation may be subject to management measures) *Alopias vulpinus* *Carcharhinus brevipinna* *Carcharhinus limbatus* *Carcharhinus plumbeus* *Carcharias taurus*	All species in Maltese waters classified as DD. Nature Protection Unit (Environment & Planning Authority) commissioned study and associated	The national fishing fleet does not perform finning. No special permits have been issued pursuant to EC Regulation n° 1185/2003.	Critical habitats have not yet been identified. Some mapping of nursery areas and spawning ground for some demersal sharks being carried out by the Veterinary Affairs &Fisheries Division (VAFD). Legislation provides for creation of Marine Conservation Areas which can support protection of nursery grounds and protection of juveniles.	No management programmes covering shark species. A Fleet Management programme will be set up to efficiently manage the national fishing fleet on the basis of the gear utilised. This will indirectly assist in proper management of bycatch e.g. through more selective use of gear in surface longlining	Yes, under the Malta Centre for Fisheries Science, conducted by VAFD. Two data collection programmes/ surveys (MEDITS and MEDLEM) plus collection programmes for Fisheries Landing Data (see Box 6).	No but under consideration by VAFD. Will involve fishers, the Armed Forces of (Malta Maritime Squadron) due to their involvement in fisheries enforcement) and the general

	Galeorhinus galeus *Hexanchus griseus* *Isurus oxyrinchus* *Lamna nasus* *Leucoraja melitensis* *Prionace glauca* *Pristis pristis* *Rostroraja alba* *Squatina squatina*. Protection conferred through Flora, Fauna and Natural Habitats Regulations (311/2006) issued under the Environment Protection Act (Malta Environment and Planning Authority).	database *Threatened Fish of the Maltese Islands* (ADI & EcoServ, 2006).			and bottom trawling. Fisheries enforcement comes under the responsibility of the Armed Forces (limited capacity because of other responsibilities). Onboard fisheries inspections only carried on in waters under national jurisdiction.		public.
Monaco	Protection is mainly delivered through legislation for implementation of CITES (Ordonnance Souveraine n° 67 du 23 mai 2005, Journal de Monaco du 26 mai 2006 n° 7757).	No	No	Two MPAs: Larvotto (Ordonnance Souveraine du 25 avril 1978) and Spélugues (Ordonnance Souveraine du 29 août 1986) as well as the trilateral Pelagos Sanctuary. Not established with reference to sharks.	Not applicable as there are no fisheries in Monaco.	There is no monitoring system as there are no fisheries.	No
Montenegro	Strict protection for *Carcharodon carcharias* and *Lamna nasus* under the Decision on Endangered or Threatened Species of Flora and Fauna (2006) and CITES implementation legislation (Decision on control list of import, export and transit: Official Gazette RME, no. 28/06).	No available data or capacity for this taxonomic group		Ministry of Agriculture, Forestry and Water Management has jurisdiction over fisheries. The new Law on Marine Fisheries regulates commercial fishing and mariculture and provides for protection of marine biodiversity. EU support to Montenegro focused on strengthening administrative structures to ensure effective implementation of fisheries policy.	Nothing specific for sharks, though marine fisheries management plan is under preparation. National Strategy for Sustainable Development prepared in 2006: targets include protecting at least 10% of the coastal zone by 2009. National ICZM Strategy being finalised.	None.	Nothing specific but members of Institute for Marine Biology attend training courses, seminars and workshops.
Morocco							

Slovenia	Strict protection for *Carcharodon carcharias* and *Cetorhinus maximus* (covers harm, disturbance, poisoning, killing, hunting or keeping in captivity) under Decree on Protected Wild Fauna, Official Bulletin 46/2004 (Ministry of Environment and Physical Planning)	Some data now available on species found in Slovenian waters and their status is being evaluated.	Finning not specifically mentioned but falls under the general protection regulations.	No legal protection of shark critical habitats or proper fishery management programmes	Fisheries management programmes do not refer specifically to shark fishes. Bycatch is the major problem. An Action Plan is to be drafted in 2009.	No mandatory monitoring but ongoing research and data collection carried out by the Marine Biological Station.	None.
Spain	None.		Permitted only under special permit in accordance with EC Regulation n° 1185/2003		Integrated national management plan for the conservation of the fisheries resources in the Mediterranean Sea (*Order APA 79/2006*, Ministry of Agriculture, Fisheries and Food). No specific provisions on sharks but general provisions for closed seasons for trawling and other fisheries; ban on bottom trawling below 1000m depth; protection of critical vulnerable habitats e.g. seagrasses, maerl beds, coral reefs.		Workshop on Sharks Sustainable Fisheries (Feb 2008) jointly organised by Fisheries Department and the Spanish Fisheries Alliance with stakeholder participation. Proposals include rapid production of species identification brochure.
Syria							
Tunisia		Yes for *Rhinobathos rhinobatho s*	No	There are critical habitats in the Gulf of Gabès but these are not legally protected.	Some. It is prohibited to fish rays and skates less than 40 cm and torpedos below 20 cm in length, measured from tip of snout to start of tail (Decree	Yes. Monitoring covers many species (research projects plus the MEDLEM framework.	Limited. Few actions with fishers.

					28.9.1995, Minister of Agriculture)		
Turkey	Strict protection for *Carcharhinus plumbeus* and *Cetorhinus maximus* (covers harvesting and trade) under Circulars on Fisheries, (related to Fisheries Law:1380) Ministry of Agriculture and Rural Affairs.	No specific research on population dynamics or migratory routes.	Not regulated, as finning does not take place in Turkish waters.	Mating and breeding habitats of *Carcharhinus plumbeus* in the Bay of Boncuk are protected by the Environmental Protection Agency for Special Areas	No programmes specifically for sharks as there are no directed fisheries.	Determining the occurrence and distribution patterns of C.plumbeus within the survey area, using *in situ* observation techniques, Annual survey (Two Months) in Bay of Boncuk for *Carcharhinus plumbeus.* Determining the possible threats on local sand-bar shark population, Processing all the observation and threat data us-ing GIS (global information system) on 1/25000 scale maps,	Several brochures have been prepared and distributed for public awareness, in addition to the book entitled "Conservation and Monitoring Project of Sandbar Sharks (*Carcharhinus plumbeus*) in Boncuk Bay, Gökova Special Environmental Protection Area".

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Annex X - *Action Plan for the Conservation of Cartilaginous Fish (Chondrichthyans) in the Mediterranean:* Updated implementation timetable 2010–2013.

Action Plan for the Conservation of Cartilaginous Fish (Chondrichthyans) in the Mediterranean: Updated implementation timetable 2010–2013.

Action	Deadline	By whom
Tools		
1. Establish directory of national, regional and international experts on chondrichthyan fish taxonomy, biology, stock assessment, conservation and management, supported by an external panel of experts.	1 year after adoption	RAC/SPA, advised by IUCN Shark Specialist Group, ICES & ICCAT Shark Working Groups
2. Develop, print and distribute regional and national field identification guides and sheets, highlighting diagnostic characteristics, for improved monitoring of elasmobranch fisheries and landings by government bodies and fishermen. Priority areas: i) Southern and eastern Mediterranean (in Arabic, French, Spanish); ii) Adriatic, Aegean, Ionian (in Croatian, Albanian, Italian, Greek, Turkish); iii) Northwestern Mediterranean (French, Spanish).	1 year after adoption (basic ID sheets) 2–3 years (more detailed guides)	GFCM/FAO National scientific and management bodies Regional cooperation agencies
3. Promote use of existing standard monitoring protocols and forms (RAC/SPA, FAO) for landings, discards and observations of threatened species;	Immediate & continuous	National scientific and management bodies, Regional cooperation agencies, GFCM and FAO
4. Develop protocols and programmes for improved compilation and analysis of data, for contribution to regional stock assessment initiatives.	1 year after adoption	
5. Formalise/reinforce synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the GFCM.	Immediate & continuous	
6. Add further information on elasmobranch bycatch to national reports to GFCM, for incorporation in GFCM database, as recommended by GFCM workshop on bycatch (Rome, 2008)	1 year after adoption	Contracting Parties, GFCM
7. Undertake information campaigns, improve the provision of materials for publication, and disseminate more widely existing RAC/SPA, FAO and other products (e.g. the RAC/SPA *Guidelines for reducing the presence of sensitive species in by-catch*). These activities should target managers, researchers and the general public.	2 years after adoption	AP Partners, Associates and donor agencies
8. Develop guidelines and/or a code of conduct for the management of shark and ray fishing. These will promote catch and release, describe protocols for handling catches in order to minimise stress and improve survival, and encourage reporting of such catches.	1 year after adoption	RAC/SPA, GFCM Scientific Committee
9. Promote a shift in focus of shark and ray sport/recreational fishing towards catch and release, contributions to research activities (for example through engagement in tag and release programmes), and improved reporting of catches.	2 years after adoption	Contracting Parties
Legal processes		
10. Establish strict legal protection for threatened and endangered species listed in Annex II through appropriate national laws and regulations.	As soon as possible	Contracting Parties
11. Establish and promote national, sub-regional and regional plans or strategies for the conservation, recovery and/or management, as appropriate, of species listed in Annexes II and III.	4 year after adoption	Contracting Parties, RAC/SPA, GFCM
12. Support GFCM finning prohibition by enacting national regulations for the prohibition of finning at sea, transport, landing and transhipment of fins without corresponding carcass, by all vessels in national and international waters.	As soon as possible	Contracting Parties
13. Protect critical habitats for chondrichthyan fishes, as soon as they are identified.	Continuous	Contracting Parties, MEAs,

Action	Deadline	By whom
Monitoring and data collection		
4. Promote existing research proposals developed under the RAC/SPA Action Plan (Eastern Adriatic, Balearics, Gulfs of Gabes and Sirta) by adapting them to funding proposals for the consideration of potential funding bodies, partners and Contracting Parties.	1 year after adoption	RAC/SPA
5. Initiate comprehensive programme/campaign to support data collection efforts in:) Gulfs of Gabes and Sirta, Levantine basin (areas of highest biodiversity importance for chondrichthyan fishes in the Mediterranean and a high priority for development of precautionary management measures); and i) Eastern Adriatic (an important region for demersal fisheries and for large rare Mediterranean elasmobranchs).	2 years after adoption 3 years after adoption	National scientific bodies/institutes, Regional cooperation agencies, GFCM
6. Promote input to the MEDLEM database under the appropriate protocol, to ensure shared access to information on chondrichthyan fishes across the Mediterranean.	Immediate, continuous	Contracting Parties, GFCM
7. Complete and disseminate inventories of critical habitats (mating, spawning and nursery grounds)	2 years after adoption	Contracting Parties
8. Increase efforts to comply with obligations to collect and submit species-specific data on commercial chondrichthyan fish catch and bycatch to FAO and GFCM, including through increased use of observers on fishing vessels.	Immediate & continuous	Contracting Parties
9. Comply with obligations under existing ICCAT/GFCM Recommendations to collect and submit data on pelagic shark catches.	Immediate	Contracting Parties
0. Improve programmes for the collection of data from coastal fisheries.	Immediate	Contracting Parties
1. Support the participation of relevant experts on the conservation of cartilaginous fishes in RFMO (e.g. ICCAT, GFCM) meetings and workshops, in order to share expertise and improve capacity to undertake data collection, stock assessment and bycatch mitigation.	Immediate	Contracting Parties, RFMO, RAC/SPA
Management and assessment procedures		
2. Review existing sources of data and undertake new studies if necessary to clarify the status of species that are/were not rare in the Mediterranean but are assessed as Data Deficient or Near Threatened, prioritising *inter alia*: *Raja radula* and other endemics, *Mustelus punctulatus*, *Carcharhinus* spp. and other large sharks	2 years after adoption	Contracting Parties, Partners
3. Monitor Critically Endangered, Endangered and endemic species	Continuous	Contracting Parties
4. Provide to the GFCM an annual description of all national target and/or bycatch chondrichthyan fisheries, in the form of annual Shark Assessment Report.	Every year	Contracting Parties
5. Develop and adopt as a matter of urgency where these do not exist national Shark Plans within the framework of the FAO IPOA–Sharks, incorporating specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch.	1 year after adoption	Contracting Parties individually and through GFCM
6. Undertake discussions with GFCM with a view to promoting the eventual development of a Regional Shark Plan and associated fisheries management measures and regulations outside territorial waters, to complement and assist with the implementation of activities under the RAC/SPA Action Plan.	2 years after adoption	Contracting Parties, GFCM
7. Review national and regional Shark Plans every four years	4 years after adoption	Contracting Parties, GFCM
9. Implement a programme for the development of stock assessments, by area (Adriatic, Gulf of Gabes, Levantine Sea), and by species.	2 years after adoption	Contracting Parties, GFCM

Annex XI - Draft Guidelines for reinforcing laws and regulations on the conservation and management of bird species listed in Annex II & III of the SPA/BD Protocol

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SUMMARY

I. Aims of the contract

The main aim of the contract was to craft a technical guide to help and assist the Contracting Parties to the Barcelona Convention to implement the Action Plan on the conservation of bird species listed in Annex II to the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean.

This document must help the Contracting Parties to advance, if need be, their legislation and regulations on the protection and management of the concerned bird species in compliance with the objectives and measures that appear in the Action Plan.

II. Means used by the consultant to respond to the request

First, the consultant sought out and analysed the main international or supranational texts likely to be used by the Contracting Parties for adopting pertinent measures for the protection and management of the concerned birds.

After analysing the content of the action plan, as well as the various international and supranational texts on the categories of bird appearing on the list in Annex II to the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean, the consultant went on to study the specific laws of the Contracting Parties in this field. To this end, a questionnaire (drawn up according to the various objectives of the Action Plan) was sent to all the Focal Points to establish more precisely the present state of regulation in their countries, particularly concerning: the conservation of bird species and their habitats, the management of human activities likely to have an effect on these species, the tools in force for the knowledge and monitoring of species of wild birds, and the educational and informational measures being implemented.

At the end of this phase of analysis of all the norms in force concerning the protection and management of the concerned bird species, the consultant was able to craft a technical guide, bearing in mind these pieces of information and the objectives and measures written into the Action Plan.

III. Results obtained

The international and supranational texts on the protection and management of birds contain many principles and measures that are likely to be used by the Contracting Parties. Indeed, the protection and management of these species (and their habitats) is the subject of many European Directives (the Birds Directive, the Habitats Directive, etc.) and also of international texts (the Bonn Convention, the Berne Convention, CITES, the AEWA Agreement, etc.) As a result, the states have a wide range of arrangements enabling them to adapt their legislation and regulations to suit the objectives of the Action Plan and the measures already in force in their countries.

However, analysis of the arrangements in force in the countries was rather more tricky because of the difficulties encountered in the collection of pertinent information. Thus, only the Focal Points of Montenegro, Libya, Lebanon, Turkey, Bosnia Herzegovina and Spain

were able to answer the questionnaire within the given time. As a result, the technical guide is mainly inspired by the supranational norms in force.

The work of writing the guide was inspired, as to its form, by the document on the guidelines for establishing laws and regulations on the conservation and management of marine turtle populations and their habitats.

The technical guide contains general recommendations as well as specific recommendations that deal with four main fields:

- Conserving, managing and restoring bird species
- Conserving, managing and restoring the habitats of bird species
- Measures of information and awareness for the various actors
- Integrating measures for the conservation of bird species and habitats within coastal and marine planning processes.

IV. The consultant's main recommendations

The consultant recommends:

- That the states, when this seems necessary, carry out a complete assessment of their (legislative and regulatory) mechanism for protecting bird species and their habitats in order to learn lessons about the measures to be adopted. In fact, adopting the action plan for the conservation of birds in annex ii to the spa protocol offers an opportunity for the states to assess their national systems in order to harmonise the adopted measures, while respecting special national features.

Indeed, the fact that the various countries have such a heterogeneity of measures for protecting birds and their habitats acts as a brake to the protection and management of these species, which, because of their migratory movements, require global, harmonised protection carried on between the various countries to be fully efficacious.

- That the states give priority to the adopting of special common legislation on the protection and management of bird species and of their habitats that contains clear objectives setting out the priorities, defining the major principles intended to ensure the protection and management of these species, etc.

- That the adoption of measures and mechanisms of protection and management bear in mind those that have been adopted for other species. Thus it does not seem pertinent, for example, to carry out a host of „impact studies' assessing the consequences of human activities on the environment. This kind of procedure is recommended in the technical guide on turtles and also in the present guide. It thus seems more judicious to provide for a single impact study procedure that would be applicable to turtles, birds, etc.

Generally speaking, there has to be dovetailing between the different technical guides produced on RAC/SPA's initiative when this is possible and pertinent.

I. Analysis of the existing legal frameworks

1.1. Introducing the international and supranational regulations now in force

There are 7 main great international and supranational texts that directly concern the kinds of bird that appear on the list in Annex II to the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean. The following texts appear in chronological order.

I.1.1. The African Convention of 15 September 1968 on the conservation of nature and natural resources

Introduction

The aim of this Convention was to encourage the Contracting Parties to implement actions to be undertaken, both individually and jointly, for the conservation, use and valorization of soil, water, flora and fauna resources. The Parties must conserve and rationally use fauna resources by improved management of populations and habitats, and monitoring hunting, capture and fishing.

Bird species appearing on the list in Annex II to the Protocol and concerned by this text

5 bird species that appear on the list in Annex II to the Protocol are concerned by this text: the white pelican, the Dalmatian pelican, the greater flamingo, the osprey and the Eleonora's falcon.

Main objectives and measures provided for by this text

The aims emerging from this Convention (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Conservation of species and habitats: inventorying species, mapping their distribution, sustainably managing conservation areas, preventing the introduction of non-native species, eradicating harmful species, regulating removal, etc.
- Strict protection given to certain species
- Modes of creating conservation areas
- Assessing and reducing the impact of human activities on species
- Developing cooperation, research, information and awareness.

I.1.2. The Washington Convention of 3 March 1973 on the international trade in endangered species of fauna and flora (CITES Convention)

Introduction

The aim of this Convention was to guarantee that international trade in the species (as well as parts and products that derive from them) listed in its Annexes should not harm the

conservation of biodiversity and should rest on a sustainable use of wild species.

Bird species appearing on the list in Annex II to the Protocol and concerned by this text

4 bird species that appear on the list in Annex II to the Protocol are concerned by this text: the Dalmatian pelican, the greater flamingo, the Eleonora's falcon and the slender-billed curlew.

Main objectives and measures provided for by this text

The aims emerging from the CITES Convention (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Regulation of trade in endangered specimens that are or could be affected by trade: international movement of the concerned species, whether commercial or not, is only permitted for specimens with accompanying permits/certificates that prove that their removal is legal and compatible with the permanence of the species from which they spring
- Regulation of trade in specimens that, although not currently automatically endangered, could become so if the trade in specimens of these species was not subject to strict regulation, whose aim is to avoid exploitation that is incompatible with their survival: delivery of permits/certificates for international movement of the species concerned.

I.1.3. EEC Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (the Birds Directive)

Introduction

This text organizes the protection of habitats that are necessary for the reproduction and survival of bird species including those considered to be rare or threatened on a European scale. In each country of the European Union those sites that are best suited to the conservation of the habitats of these species will be listed as Special Protection Areas (SPAs), bearing in mind their number and special features. This text concerns birds and also their eggs, nests and habitats.

This Directive is „rounded off' by the Council's Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Main objectives and measures provided for by this text

The aims emerging from these texts (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Creation of Special Protection Zones (SPZs)
- Restoration of destroyed biotopes and the creation of biotopes
- Crafting of special conservation measures concerning the habitats of species in order to ensure their survival and their reproduction within their distribution area

- Centralization and coordination of information to constitute a consistent protection network
- Prevention of pollution and of deterioration of habitats
- Introducing a general system of species protection including a certain number of bans: on killing or deliberately capturing, destroying or harming nests, etc.
- Regulating hunting
- Looking for information on certain species
- Regulating the introduction of non-native species.

I.1.4. The Bonn Convention of 23 June 1979 on the Conservation of Migratory Species of Wild Animals

Introduction

The Bonn Convention aimed at the conservation of migratory species throughout the world. It pays special attention to migratory species whose conservation status is unfavorable and expects that member states will adopt the appropriate and necessary measures to conserve these species and their habitats. Furthermore, measures intended to avoid a migratory species becoming an endangered species are also envisaged in this text.

Bird species appearing on the list in Annex II to the Protocol and concerned by this text

11 bird species that appear on the list in Annex II to the Protocol are concerned by this text: the pygmy cormorant, the white pelican, the Dalmatian pelican, the greater flamingo, the osprey, the Eleonora's falcon, the slender-billed curlew, the Audouin's gull, the lesser Crested tern, the sandwich tern and the little tern.

Main objectives and measures provided for by this text

The aims emerging from the Bonn Convention (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Promoting research work on migratory species
- Adopting measures concerning endangered species: conservation and restoration of habitats, evaluation and reduction of the impact of human activities, regulation of the introduction of non-native species, regulation of the removal of species, etc.
- Adopting measures on migratory species whose conservation status is unfavourable: the Convention clearly sets out guidelines to guide the crafting of agreements intended to ensure the restoration or maintaining of the concerned migratory species in a favourable state of conservation.

I.1.5. The Berne Convention of 19 September 1979 on the Conservation of European Wildlife and Natural Habitats

Introduction

The Berne Convention aimed at the conservation of wild flora and fauna and their natural habitats, in particular species and habitats whose conservation requires the cooperation of many states, and at promoting such cooperation. This text pays special attention to endangered and vulnerable species (including migratory species).

Bird species appearing on the list in Annex II to the Protocol and concerned by this text

13 bird species that appear on the list in Annex II to the Protocol are concerned by this text: the Mediterranean shearwater, European storm petrel, the European shag, the pygmy cormorant, the white pelican, the Dalmatian pelican, the greater flamingo, the osprey, the slender-billed curlew, the Audouin's gull, the Lesser Crested tern, the Caugek tern and the little tern.

Main objectives and measures provided for by this text

The aims emerging from the Berne Convention (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Protecting habitats: taking the conservation needs of protected areas into account in improvement and development policies, in order to avoid or reduce as far as possible the deterioration of such areas
- Species conservation that involves a certain number of bans: on deliberate capture, intentional possession and killing, on the deliberate deterioration or destruction of sites of reproduction or rest areas, on the deliberate disturbance of wild animals, on the destruction or deliberate gathering of eggs in the wild or their possession, on the possession and internal trade in such animals, etc.
- Developing coordination on information and research work.

1.1.6. (EC) Council Regulation no. 1627/94 of 27 June 1994 establishing general arrangements on special fishing authorization

Introduction

This text laid down arrangements on special fishing permits applicable to Community fishing ships and ships flying the flag of a non-member country operating in the Community fishing area.

Bird species appearing on the list in Annex II to the Protocol and concerned by this text

14 bird species that appear on the list in Annex II to the Protocol are concerned by this text: the Cory's shearwater, the Mediterranean shearwater, the European storm petrel, the European shag, the pygmy cormorant, the white pelican, the Dalmatian pelican, the greater flamingo, the osprey, the Eleonora's falcon, the slender-billed curlew, the Audouin's gull, the lesser crested tern, and the little tern.

Main objectives and measures provided for by this text

The aims emerging from this European ruling (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Regulating fishing: ban on certain fishing methods, ban on fishing in certain places.

1.1.7. Agreement of 16 June 1995 on the conservation of African-Eurasion migratory waterbirds (AEWA)

Introduction

This text aimed at protecting migratory bird species that are ecologically dependent on wetlands in their migratory routes for at least part of their annual cycle. The Agreement provides for coordinated and concerted action from the states along the migratory routes of waterfowl.

Bird species appearing on the list in Annex II to the Protocol and concerned by this text

9 bird species that appear on the list in Annex II to the Protocol are concerned by this text: the pygmy cormorant, the white pelican, the Dalmatian pelican, the greater flamingo, the slender-billed curlew, the Audouin's gull, the lesser crested tern, the Sandwich tern and the little tern.

Main objectives and measures provided for by this text

The aims emerging from the AEWA action plan (as well as the concrete measures put into effect to attain these objectives) likely to inspire states in adopting laws and regulations on birds concern:

- Species conservation: ban on the removal of birds (and eggs), ban on deliberate disturbance, etc.
- Regulating the introduction of non-native species: ban, eradication etc.
- habitat conservation: inventorying habitats, special protection for wetlands, etc.
- Managing human activities: regulating hunting, regulating ecotourism, assessing and reducing the impact of human activities, etc.
- Looking for and monitoring species
- Developing information and awareness campaigns.

I.2. Heterogeneity of the existing national systems

Analysis of national laws on the protection and management of bird species reveals a great disparity between the countries, especially as regards:

- Taking the impact of human activities on bird species into account
- Modes of planning on the ground
- Treaties on the protection of species that have not been ratified by all the states party to the Barcelona Convention (in particular the AEWA Agreement)
- Collecting and exchanging information on species between the states or the appropriate institutions
- Training measures organized to serve knowledge about and protection for species and their habitats
- Mechanisms for protecting and managing threatened species and their habitats.

This admission constitutes a brake on the adoption of measures to ensure „global' protection of species and their habitats. Adoption of the Action Plan for the Conservation of the Birds in

Annex II to the SPA Protocol offers an opportunity for the states to undertake a complete evaluation of their (legislative or regulatory) mechanisms for protecting species and their habitats and to learn from this about the steps they should take.

Implementing the Action Plan should enable the measures now in force to be harmonized, though special national features will be respected, in order to ensure more global and more effective protection of species and their habitats.

Also see on this aspect Annex I: States' answers to the questionnaire

I.3. Guidelines on crafting appropriate legislation

(a) When the international instruments are drafted in terms that make their immediate application impossible, the states should adopt legal arrangements and regulations that enable these supranational rules to be integrated within the national legal systems
(b) The laws and regulations thus adopted should use simple, precise terms, especially when defining rules and procedures in order to render the arrangements directly operational
(c) A state may have recourse to one (or several) sector-based laws or one special common law on the protection and management of bird species and their habitats
(d) When birds are concerned by several laws, these must tally in order to avoid contradictions likely to hinder the implementing of the arrangements
(e) The law/s adopted should contain the following elements:

- Clear objectives that set out priorities. These objectives must comply with the international texts in force and with those defined in the Action Plan
- The defining of major principles such as: impact activity assessment, the precautionary principle, the polluter pays principle, access to information and public participation
- The appropriate authority should have adequate means to: craft regulations and provide for incentives for checking and managing activities and processes likely to have a significant impact on species and their habitats, establish procedures and obligations ensure the monitoring of the implementation of these arrangements, make inventories in order to supplement knowledge, etc.

II. Guidelines for the conservation, management and restoration of bird species listed in Annex II to the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean

II.1. Inventorying, knowledge and monitoring of species

(a) The states should establish and strengthen monitoring programmes whose aim is to compile data on the status and evolution of a population (coordinated ringing programmes, etc.)

(b) The states should give priority to research on mapping areas of reproduction, feeding, moulting and wintering in compliance with Item 4.3. of the Action Plan (particularly as regards pelagic birds)

(c) The states should:

- Make a map showing the distribution of species at sea and on land
- Implement a monitoring system to record the incidental capture and death of birds during fishing operations
- Monitor the levels of mercury and chlorinated hydrocarbons in particular in cory's shearwater populations
- Particularly monitor the wintering and reproducing populations of the pygmy cormorant and the dalmatian pelican
- Do research on the feeding of the pygmy cormorant
- Look into the causes of decline of the osprey
- Assess the impact of local fisheries on the successful reproduction of lesser crested terns
- Determine more clearly the size and changes in the populations of lesser crested terns and little terns

(d) Generally speaking, the states should draw their inspiration from the objectives listed in Article XVIII of the African Convention for the Conservation of Nature and Natural Resources concerning research efforts, according to which the states must:

- Coordinate their research programmes, when possible, to achieve maximum synergy and complementarity
- Pursue the exchange of results of research
- Work to promote joint research activities and programmes.

II.2. Protection of species

II.2.1. Legal status of species

(a) The legislation/regulations must give strict protection status to the fifteen bird species listed in Annex II to the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean

(b) The legal protection measures must apply to the birds and also to the parts and products that are derivative, including eggs and their nests

(c) The birds must be protected at every stage of their life cycle. The legal protection measures should therefore also concern chicks.

II.2.2. Crafting national action plans

(a) In compliance with Item 5.4 of the Action Plan, the Parties to the Barcelona Convention must craft national action plans for the conservation of threatened and endangered birds in the Mediterranean

(b) These national action plans must:

- Target the current factors that cause loss or decline in bird species: plans regarding the incidental capture of specimens during fishing operations, etc. (see item ii.3.3.)
- Ensure the continuous monitoring of populations

(c) The Parties to the Barcelona Convention must implement and make effective those action plans that already exist.

II.3. Regulating human activities likely to have an impact on species

II.3.1. Regulating removal

II.3.1.1. Guidelines on legislation/regulations on deliberate removal

(a) The legislation/regulations should craft specific regulations on removal, concerning:

- Modes of removal
- Limits likely to be established concerning the number of species removed
- Means of checking whether the legislation/regulations are being respected

(b) The legislation/regulations should state clearly a certain number of bans, concerning:

- The removal of birds belonging to seriously threatened populations during the various phases of reproduction and rearing young and during their return to the areas of reproduction insofar as this removal has an unfavourable effect on the state of conservation of the concerned population
- The deliberate disturbance of species, especially during periods of reproduction, nesting, wintering and migration
- Degrading, deliberate destruction or collecting of eggs and nests in the wild

- The possession of eggs (even empty ones) or nests of the species
- The use of or trade in illegally removed species

(c) Certain general terms used in the legislation/regulations must be precise in order to strengthen the bans. Thus the definition of the ban on deliberate disturbance must be sufficiently precise to include any disturbance that is significant for the conservation of the concerned population.

II.3.1.2. Guidelines on the framing of exemptions and derogations

(a) Exemptions and derogations can be granted regarding the rules and bans set out above. These derogation rules must be strictly framed and should only be granted:

- If the national or supranational texts governing this type of derogation are respected
- If there is no other satisfactory solution
- If the exemption does not harm the survival of the species
- If the content of these exemptions is precise and justified by reasons defined beforehand
- If they are limited in time and space.

Example 1: The AEWA Agreement allows the adopting of derogations that satisfy the following reasons: preventing major harm to crops, water or fisheries; in the interests of air security or other priority public interests; for the purposes of research and teaching, restoration and for rearing necessary for these purposes, etc.

Example 2: The Habitats Directive (Article 16) permits, on certain conditions, derogations granted in the interests of: protecting wild fauna and flora and conserving natural habitats, health and public safety, for the purposes of research, etc.

(b) It is vital that the derogations and exemptions granted be monitored and checked. To this end, the appropriate authorities should be obliged to establish a file whose contents may be inspired from the arrangements in the Habitats Directive (Article 16):

- The species which are the subject of the derogations and the reason for the derogation, including the nature of the risk, with, if need be, an indication of the (not selected) alternatives and the scientific data used
- The means, facilities or methods of capture or killing of animal species that are permitted and the reasons for their use
- The circumstances of time and place in which these derogations are granted
- The authority which is authorized to state and check that the required conditions are met and to decide which means, facilities or methods can be implemented, within which limits and by which services, and who are the people responsible for carrying this out
- The monitoring measures implemented and the results obtained

(c) Exemptions related to endangered species must be the subject of notification given to the Contracting Parties to the Protocol of the Barcelona Convention.

Source: Article 12 of the Protocol of the Barcelona Convention

II.3.2. Regulating hunting

(a) The states must make sure that hunting species does not compromise conservation efforts made in their distribution area

(b) The members states must make sure that the practice of hunting, as it results from the application of the national measures in force, respects the principles of rational use and of balanced regulation from the ecological point of view, of the concerned bird species

(c) The states must make sure that the arrangements in the Birds Directive, which concerns 10 bird species appearing on the list of the Protocol of the Barcelona Convention (and these arrangements may go so far as to ban the hunting of certain species) are respected

(d) In compliance with Article 7 of the Birds Directive, the states must make sure:

- That the species to which the hunting legislation applies are not hunted during the nesting period or during the different phases of reproduction and dependence
- That the migratory species to which the hunting legislation applies are not hunted during their period of reproduction and during their return route to the place where they nest

(e) The states must forbid recourse to all means, facilities or methods of mass, or non-selective, killing or capture or which can locally lead to the disappearance of a species

(f) Derogations from the hunting regulations may be granted. These derogations should be grounded and be applied in a way that respects the arrangements provided for in Article 9 of the Birds Directive.

II.3.3. Regulating fishing

(a) Interaction between fishing and certain bird species is often unsatisfactory. The appropriate authorities should craft action plans intended to better grasp the impact of fishing activities on certain species (in particular the Cory's shearwater and the Mediterranean shearwater, European shag, the Dalmatian pelican, the Audouin's gull): analysis of mortality due to incidental catch, the level and consequences of the dwindling fishing reserves, the impact of local fisheries on reproduction, etc.

(b) The law/regulations should contain specific, appropriate measures according to the impact of the activities on species, such as:

- Restricting the fishing effort in certain areas or at certain periods
- Banning certain fishing techniques that are incompatible with the conservation of the species
- Reducing to a minimum the pollution caused by such practices
- Introducing dissuasive penalties in cases where the regulations are not respected (administrative or even penal sanctions)

(c) The states should allow fishermen to participate in crafting and implementing the action plans.

- Here, see: Guidelines to reduce incidental catch of sea birds in the Mediterranean

II.3.4. Preventing oil slicks and chemical pollution

(a) In compliance with Article 21 of the Protocol, the Parties must as quickly as possible inform the other Parties, the states that can be affected, and the Centre about any situation that could endanger the ecosystems in the specially protected areas or the survival of species of fauna and flora

(b) The appropriate authorities should craft and apply emergency measures for bird species when exceptionally unfavourable or dangerous conditions arise (oil slicks in particular). With a view to efficacity, these measures should be implemented in cooperation between the states every time this is possible and pertinent.

II.3.5. Regulating trade in species

(a) Four bird species (Dalmatian pelican, greater flamingo, Eleonora's falcon and slender-billed curlew) come under the field of application of the CITES Convention; the appropriate authorities must make sure its arrangements are respected

(b) The training of customs officers so that they are able to identify the species concerned may be envisaged

(c) The legislation/regulations may be inspired directly from the arrangements of the CITES Convention in order to regulate the trade in species which are not covered by this Convention. Thus, the international movement of species (whether commercial or not) should only be permitted for specimens that are accompanied by permits/certificates that prove that their removal is legal and compatible with the permanence of the species of which they are part

(d) Such bans may also be enacted regarding transactions between the Parties themselves or with non-Parties to the CITES Convention, in compliance with Article X of this Convention

(e) Permits (or certificates) should be delivered by the appropriate managing authority and repeat the contents and conditions of the grant defined by the CITES Convention

(f) Derogations regarding the permit rules may be envisaged while respecting the arrangements of the CITES Convention on this point (Article VI)

(g) The states can adopt internal measures that are stricter than those of the CITES Convention as regards the conditions regarding the trade, capture or collection, possession or transport of specimens of the listed species

(h) The states must take the appropriate steps to punish non-respect of the arrangements, in particular by:

- Introducing dissuasive penal sanctions on either the trade in, or the possession of, such specimens, or both
- Confiscation or return to the exporting state of such specimens

(i) In compliance with article viii.4. Of the cites convention, in the case where a live specimen is confiscated in the conditions given above, the following steps must be taken:

- The specimen must be entrusted to a managing body of the state which has confiscated it
- The managing body, after consulting the exporting state, returns the specimen at its expense, or sends it to a rescue centre or any place that this body deems to be appropriate and compatible with the objectives of the cites convention
- The managing body can ask the opinion of a scientific authority or consult the secretariat of the cites convention whenever it judges this to be desirable.

III. Guidelines for the conservation, management and restoration of the habitats of bird species listed in Annex II to the Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean

III.1. Inventorying, mapping and monitoring habitats

III.1.1. Inventorying and mapping critical habitats that contain colonies

(a) According to Article 15 of the Protocol of the Barcelona Convention, the states have an obligation to make exhaustive inventories of areas placed under their sovereignty or jurisdiction that are important for endangered or threatened species

(b) The appropriate authorities should make and publish national inventories of those habitats that exist on their territory that are important for populations of the concerned birds. These authorities should endeavour to give priority to identifying critical habitats (particularly located in the eastern Mediterranean) that contain colonies of:

- the Cory's shearwater
- the Mediterranena shearwater
- the European storm petrel
- the European shag
- the Osprey
- the Eleonora's falcon
- the Audouin's gull
- the Little tern
- the Sandwich tern

(c) These inventories and maps should be sufficiently precise to show the siting and the state of conservation of the habitats so that planning and management tools can be crafted, bearing this situation in mind

(d) Information sources used in making the inventories can include government, non-governmental and economic etc. sources; these organizations are likely to obtain the title of Action Plan Partner in compliance with Item 5.3. of this plan

(e) Identification of a critical habitat of a threatened species should lead to the adopting of appropriate measures in the concerned state.

III.1.2. Monitoring habitats

(a) Marine and coastal protected areas of importance for the conservation of birds must be correctly and continuously monitored

(b) The states should monitor and protect colonies that are subject to disturbance. To this end, the following measures can usefully be implemented:

- Undertake monitoring and research on the biology of conservation of species of Mediterranean shearwater
- Encourage the creation and monitoring of buffer areas surrounding areas of reproduction, including adjacent areas out at sea, in particular regarding colonies where species of the European
- Monitor the level and quality of water for colonies of the pygmy cormorant
- Establish supervised buffer areas around nesting colonies of the Dalmatian pelican
- Continuously monitor the nesting and wintering of populations of the Dalmatian pelican.

III.2. Protecting habitats

III.2.1. Legal status of reproductive colonies

(a) The states must forbid the destruction and deterioration of habitats of the species listed in the Protocol of the Barcelona Convention in compliance with Article 12 of this text. They must also craft and set up action plans for their conservation or restoration

(b) In compliance with Item 4.1. of the action plan, the reproduction sites of all threatened bird species must legally be made into protected areas with suitable management plans.

III.2.2. Creating specially protected areas

See on this aspect: Guidelines for the creation and management of Mediterranean marine and coastal protected areas, http://www.rac-spa.org/dl/gm2006.pdf

(a) The Parties to the Barcelona Convention should set up Specially Protected Areas where reproductive colonies exist in the conditions set out in Article 5 of the Protocol of the Convention

(b) Furthermore, planning, management, monitoring and checking measures must also be adopted for these areas. According to Article 7 of the Protocol of the Barcelona Convention, these measures should include for each specially protected area:

- Crafting and adopting a management plan that clearly states the legal and institutional framework and the management and protection measures that are applicable
- Continuously monitoring ecological processes, habitats, population dynamics and the impact of human activities
- The active participation of local people and communities, as circumstances dictate, in managing the specially protected areas, including assistance to the residents who could be affected by the creation of such areas
- Adopting mechanisms to fund the promotion and management of the specially protected areas as well as developing activities likely to ensure management that is compatible with the purpose of such areas
- Regulating activities that are compatible with the objectives that drove the creation of the specially protected area and the conditions for permits relating to this

- Training managers and qualified technical staff and setting up an appropriate infrastructure

(c) Furthermore, the states should endeavour to create nesting sites near the feeding sites of the white pelican.

III.2.3. Protection measures for colonies

(a) The states should take the appropriate steps to avoid the deterioration of habitats located in the specially protected areas as well as disturbance that affects the species for which the protected areas were intended

(b) The states should also endeavour to avoid the pollution or deterioration of habitats located outside the protection areas

(c) The Parties to the Barcelona Convention must adopt in each specially protected area the protection measures set out in Article 6 of the Protocol of the Convention, in particular:

- Enhance the application of other protocols of the Convention and of other pertinent treaties to which they are parties
- Ban the discharging or dumping of waste or other substances likely to harm directly or indirectly the integrity of the specially protected area
- Regulate the passage of ships and any stopping or anchorage
- Regulate the introduction of any species that is non-native to the specially protected area in question or genetically modified as well as the introduction or reintroduction of species that are or have been present in the specially protected area concerned
- Regulate or ban any exploring activity or one that implies a modification of the configuration of the soil or the exploiting of the subsoil of the terrestrial part, of the seabed or of its subsoil
- Regulate any scientific research activity
- Regulate or ban the fishing, hunting, capture or destruction of animals as well as the trade in animals or parts of animals coming from the specially protected areas
- Regulate and, if need be, ban any other activity or act that could harm or disturb the species or endanger the state of conservation of the ecosystems or of the species in the specially protected area
- Any other measure aimed at safeguarding the ecological and biological processes.

Also see on this point: Guidelines for the creation and management of Mediterranean marine and coastal protected areas, http://www.rac-spa.org/dl/gm2006.pdf

(d) Furthermore, the states should take the following steps advocated in the action plan:

- Manage the wintering and reproduction sites of the pygmy cormorant in order to meet this species' needs
- As far as is possible, replace hanging electric cables by thick cables or bury them, particularly in colonies of dalmatian pelicans.

III.3. Managing habitats

III.3.1. Managing introduced mammals and eradicating certain invasive species

III.3.1.1. Checking introduced mammals

(a) The states should take suitable steps to regulate the (deliberate or accidental) introduction into the wild of non-native or genetically modified species. These steps must lead to the banning of species whose introduction could have harmful effects on the habitats or species

(b) According to the terms of the action plan, the states should particularly check the introduction of non-native predator species into colonies of:

- Cory's shearwater
- Mediterranean shearwater
- European storm petrel
- Eleonora's falcon

III.3.1.2. Eradicating certain invasive species

(a) The states should implement the appropriate measures to eradicate species that have already been introduced when, after scientific assessment, it appears that these cause or are likely to cause harm to the habitats or species

(b) According to the terms of the action plan, the states should eradicate in particular predator species (such as rats) or rival species (especially the yellow-legged gull) in colonies of:

- Mediterranean shearwater
- European storm petrel
- Eleonora's falcon
- Audouin's gull.

III.3.2. Managing and restoring wetlands

II.3.2.1. Measures relating to the sustainable management of wetlands

(a) The states should endeavour to use all the wetlands in their territory in a rational and sustainable way. They should in particular be careful to avoid the degradation and loss of habitats that contain threatened populations by adopting the appropriate regulations, standards and checking measures

(b) The measures likely to be adopted by the states can be inspired from those provided for in the AEWA Action Plan, which suggests:

- Acting to introduce suitable regulatory measures that comply with all internationally accepted norms on the use of chemical products for farming, pest control procedures, and discharge of waste water, whose object is to reduce to the minimum the unfavourable impacts of these practices on populations

- Preparing and circulating documentation in the appropriate languages that describes the regulations, standards and corresponding checking measures in force, and their advantages for the population and wildlife.

III.3.2.2. Measures relating to the restoration of wetlands

(a) The states should, whenever this is possible and appropriate, rehabilitate and restore degraded wetlands used by bird species. The action plan particularly targets degraded wetlands used by the following species:

- The pygmy cormorant
- The white pelican
- The Dalmatian pelican
- The greater flamingo
- The Sandwich tern
- The little tern.

IV. Guidelines on measures for information and awareness of the various actors

(a) The states should endeavour to craft programmes, documents and information mechanisms to enable the public to become more aware of the objectives, arrangements and content of the legislation/regulations

(b) The states, when this is proved to be necessary, should set up training programmes so that the staff responsible for applying the legislation/regulations have sufficient knowledge to apply these effectively (legal training, especially ornithological training)

(c) The Parties to the Convention must give the necessary publicity to the creation of protected areas, their boundaries, the regulations applied therein and to the selection of protected species, their habitats and the relevant regulations. Particular attention must be paid to the people living inside and around the areas that are important to birds, the users of these areas (hunters, fishermen, tourists, etc.), the local authorities and other decision-makers. In compliance with Item 4.4. of the Action Plan, these public awareness campaigns must be organised and made effective in the context of cooperation with NGOs

(d) The states may also launch specific public awareness campaigns for the conservation of certain species or habitats

(e) The parties must endeavour to act so that the public and the nature protection organizations participate in the appropriate measures necessary to protect the concerned areas and species (Article 19 of the Protocol). Actively involved people or organizations are likely to obtain the title of Action Plan Partner in accordance with Item 5.3. of this plan.

V. Guidelines for integrating measures for conservation of bird species and habitats in marine and coastal planning processes

V.1. Environmental impact studies

(a) In compliance with Article 17 of the Barcelona Convention, “during the procedures which precede decision-making on industrial or other projects and activities that can have an impact seriously affecting protected areas and species and their habitats, the Parties assess and bear in mind the possible direct or indirect, immediate or long-term, impact, including the cumulative impact of the projects and activities considered.”

(b) The states can take their inspiration from the principles written into the Habitats Directive which affirms that any “project not directly linked to or necessary to the management of the site but likely to significantly affect this site, individually or in conjunction with other plans and projects, must be the subject of an appropriate assessment of its impacts on the site in view of the conservation objectives of this site.”

(c) The regulations regarding an impact study should provide for:

- the field of application of this study: in which conditions is a project likely to have an impact seriously affecting the protected areas and species and their habitats?
- The content of the study: what are the effects of the project on the environment that should be analyzed?
- The conducting of the study: which are the authorities that intervene during the study? In which cases is a public enquiry compulsory? etc.
- The consequences of the result of the study on the project

(d) The conclusions of the project’s impact assessment should lead the appropriate authorities to only agree to this project once they are satisfied that it will not harm the integrity of the concerned site, and after having tested, if need be, public opinion

(e) The assessment procedures should include strictly framed derogations, enabling a project to be carried out which, although it has an effect on species or habitats, nevertheless has to be carried out for imperative reasons of major public interest for:

- Human health
- Public safety
- Beneficial consequences that are primordial for the environment.

V.2. Planning processes

(a) The action plan requires the states to plan, regulate and/or manage activities and processes of coastal and infrastructure development near known colonies

(b) The states currently carry out this kind of obligation via laws on land use in order to check: the delivery of permits, the density of soil use, the developing of different sites, etc. Thus they should make sure that the planning processes do respect international obligations

(c) Zoning of local development plans for various classes of development should grant strict protection (unsuitability for development, or suitability for development under certain conditions) near known colonies.

ANNEXE I : Réponses des Etats au questionnaire sur les oiseaux

Après analyse du contenu du plan d'action ainsi que les différents textes internationaux et supranationaux relatifs aux catégories d'oiseaux figurant sur la liste de l'annexe II du Protocole relatif aux aires spécialement protégées et à la diversité biologique en Méditerranée, il a été décidé d'envoyer un questionnaire (en version française ou anglaise) aux différents points focaux afin de compléter les informations disponibles.

I. TEXTE DU QUESTIONNAIRE

In 1995 the Parties to the Barcelona Convention adopted a new Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean. Annex II of this new protocol lists endangered or threatened species found in the Mediterranean. The Action Plan for the Conservation of bird species listed in annex II of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean was approved at the XIII Conference of Contracting Parties to the Barcelona Convention at Catania, Sicily, in November 2003.

The aim of the Regional Activity Center for Specially Protected Area (RAC/SPA) is to assist and support Mediterranean countries in the implementation of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean and its related action plans. In this ways, le RAC/SPA ordered the working-out of a technical guide to design national legislation and regulations concerning bird species conservation and management.

This questionnaire constitutes an important component for the working-out of the technical guide and the answers given by your country allow us to reach the most complete stage of current regulations. On the basis of this information and of the objectives settled by the Action Plan, the appropriate regulations will be defined in the technical guide.

Questionnaire

N.B. : The countries having referential information in computer form (or hypertext link) are asked to include these documents in their answers to the questionnaire. Thanks in advance for the time spent and the efforts made to answer the questionnaire.

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

1.2.a. Did your country implement any legislation or regulations to forbid or regulate :

- The taking of birds?

- birds trade?

- birds hunting?

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea …) for the protection and management of bird species and habitat?

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

3.2. What activities supervising wild birds and habitat did your country undertake?

3.3. Did your country organize any exchange of data with other countries or appropriate organizations?

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public …)?

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

5.2. How does your country assess the working-out of these plans?

5.3. Did your country ratify the AEWA Agreement?

II. REPONSES DES POINTS FOCAUX

II.1. MONTENEGRO

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

Government of Montenegro adopted Law on Nature protection (51/08) which is harmonized with EU Directive of wild bird and EU Directive on habitat. According to the articles 89 and 90 Law on nature protection proscribe measure for bird protection and migratory species.
Bird Protection Measures

It is prohibited to deliberately kill or capture strictly protected birds, in particular migratory birds, to destroy their nests and eggs or remove nests even when empty, their disturbance particularly at the time of feeding nestlings and during reproduction, holding birds which are prohibited for hunting, as well as other activities stipulated by this law.

Protection Measures for Migratory Species

Public roads and other types of roads as well as other facilities the construction of which cuts known migratory paths of wild animals shall be constructed in such a manner to reduce their negative impact and with the application of special structural, technological and engineering solutions on the facilities themselves and in the vicinity thereof to enable safe passing of wild animals at appropriate distances
Special technological and engineering solutions (ecological bridges, constructed passes and crosses, tunnels, pass-through cylinders, ditches, safety and guiding facilities, fish paths and lifts etc.), which ensure unobstructed and safe passage of wild species, shall enjoy protection as natural values.

1.2.a. Did your country implement any legislation or regulations to forbid or regulate :

- The taking of birds?

- Birds trade?

Yes. According the Law on nature protection It is forbidden to use any means for capturing and killing wild species disturbing their populations and endangering their habitats and which may cause their local disappearance. Also, according to the Decision of plant and animals, 297 of birds are protected. Regulation of trade in plants and animals establish by Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES). Montenegro ratifed the CITES Convention on International Trade of Endangered Species of Wild Flora and Fauna in 2006.

- Birds hunting

The Law on Hunting determines breeding, protection, hunting and usage of game animals. Game animals, as natural assets and part of the biological diversity, enjoy particular protection and are exploited under conditions and in a way prescribed by the Law (Article 1).

Game animals are mammals and birds that live freely in the nature (Article 1, Paragraph 2). The protection of game animals is realized through a permanent ban of hunting, ban of hunting in a certain period (closed season), reduction of the hunting season or reduction of the number of hunting days, protection of the hunting areas, suppression of illegal hunting, decreasing of the number of unprotected game animals, rescuing from natural disasters, additional feeding and other measures (Article 12). According to the Law, a special regulation on closed season and reduction of the hunting season, or the number of hunting days is issued. In order to conserve and improve game animals and their protection, it is forbidden to destroy, catch and take over young animals, as well as to damage and destroy nests, fledged young and eggs of protected game animals (Article16); it is forbidden to poison game animals (Article 17); it is forbidden to move around the forest for persons with guns, hunting dogs and other hunting tools, as well as to move out of the roads of general purpose, without the permission of the hunting ground user.

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

According to the Law on nature protection a legal person shall be fined for violations in the amount ranging from one hundred to three hundred times the minimal wage in Montenegro if it:

- disturbs, captures, hurts wild animals, reduces the size of population of a wild species, destroys or damages its habitat or changes its living conditions without a justified reason (Article 82 paragraph 2);
- fails to apply measures, methods and technical devices which are least interfering with wild species or habitats of their populations (Article 83);
- captures, holds or kills strictly protected animals, damages or destroys their development forms, nests or litters, breeding sites and resting places, disturbs them at the time of reproduction, catering for the young and hibernation, damages or takes eggs from the nature (Article 85);
- uses wild protected species contrary to stipulated conditions (Article 87);
- uses prohibited means for capturing and killing wild animals or without the approval from the EPA (Article 88);

Also, according Law on hunting proscribe penalty of 2.500-12.500 euros for hunting out of season and hunting of protected species.

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea,…) for the protection and management of bird species and habitat?

Montenegro implements IMO Conventions. Now, we are preparing Law on prevention of pollutions from ships.

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

Yes, According to the Law on nature protection, Article 93 It is prohibited to introduce allochthonous species into the territory of Montenegro and into the ecosystems they do not inhabit naturally.

1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

No.

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

Yes. Ministry of Tourism and Environment prepared Master plan for development of tourism which will be adopted till the end of 2008. A number of donors and NGOs are involved in providing technical assistance in national parks, including training national park personnel, building and cleaning footpaths, bird watching, platforms for birds, compiling brochures, map and guides.

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

Montenegro starts implementation of new Law on environment impact assessment on January 2008.

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

Since 1991, National park „'Skadar lake'' in Montenegro annually monitor the number of winter census of bird species (IVC) in Skadar lake, Ramsar site. Also, every month in a last 4 year on Skadar lake ornithologist monitor nesting and migratory species.

NGO Centre for Protection and Research of Birds of Montenegro identified 13 Important Bird Areas under Birdlife International standards (IBA) in 2007 or 10.60% of total territory of Montenegro.
The Programme for Biodiversity Monitoring in Montenegro conducted by the Institute for the Protection of Nature. In fact, this Programme is an attempt to produce data on biodiversity missing so far, but it is still in the starting phase.

3.2. What activities supervising wild birds and habitat did your country undertake?

Because of lack of ornithologist, researches are separate on wetland and water birds, and also we undertake wintering census (IWC) under wetlands International and monitoring nesting birds. But only on few important wetland location is monitor, because of lack of financial resources.

3.3. Did your country organise any exchange of data with other countries or appropriate organisations?

Yes. Institute for nature protection and other institutions and NGOs cooperate and exchange data and experience with countries in the region and international organizations such as (IWC). Also, Montenegro signed a number of international and bilateral agreements and convention in the field of nature protection such as Ramsar convention.

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?

No. Such of this program is done by Center for Protection and Research of Birds of Montenegro in the wetland areas.

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public …)?

Institutions and NGOs organized some workshops and publications regarding endangered species.

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

In a framework of SAP/BIO National Report we prepared Action Plan for Dalmatian Pelicans/ Pelecanus crispus and Action Plan for Posidonia oceanica.

5.2. How does your country assess the working-out of these plans?

We collected information from other countries regarding state of population of birds for AP for Dalmatian Pelicans/ *Pelecanus crispus* and we agreed about possible cooperation with countries in the region.

5.3. Did your country ratify the AEWA Agreement?

No, but we ratified Convention on migratory birds.

II.2. LYBIE

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

The national biodiversity strategy of Libya (draft) and the National Action Plan for conservation of marine birds has dealt with this aspect in specific manner.

1.2.a. Did your country implement any legislation or regulations to forbid or regulate:

- The taking of birds? Law no.15/2003 on environment protection and improvement, chapter on protection of wildlife.

- Birds trade? There is a draft legislation on implementation of cites in libya, which include articles on bird trade.

- Birds hunting? Law no. 8 for 1968 on hunting (bending revision).

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

Penalties stated in Law 8 of 1968 are payment of fens, although those are out of date by now.

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea, …) for the protection and management of bird species and habitat?

Yes, many parts of Law 15/2003 is dealing with prevention and management of oil spills, and its effects on birds and marine environment and wildlife.

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

No.

1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

Yes, Libya is the most active party in conducting national inventories of natural areas, with the help of the RACSPA centre, for birds, Libya was the first country to carry out wintering water bird census after the adoption of marine birds AP. Since 2005 January census provided many important information and discoveries for birds in Libya. In summer, the *Sterna bengalensis* census, and ringing was a successful model of collaboration between the centres, EGA and the oil industry of Libya (see the reports with Lobna!).
The next step is to invest this data in establishment of new protected areas.

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

Yes, EGA in collaboration with UNDP started in 2007 a national project on protected areas, which include activities on ecotourism. With participation of the Libyan board for tourism, and the Libyan Agriculture Authority. The project should be finalized in 2009.

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

YES, most EIA's include part on birds, and where appropriate, details on birds of the protocol were taken into consideration.

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

Annual program set by Nature Conservation Dept of EGA

3.2. What activities supervising wild birds and habitat did your country undertake?

- Winter census in January-February.
- Summer census of Sterna bengalensis.
- Training initiative (just finished the first ever Southern Mediterranean training session in Benghazi and Hisha National Park, with support of the RACSPA and Cons. DeLittoral)
- Publishing awareness materials and preparing media campaigns.

3.3. Did your country organise any exchange of data with other countries or appropriate organisations?

Yes for limited extent, with wetlands international and RACSPA.

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?

Yes, every season there are some postgraduates or trainees participating into the winter and summer census. This could be an approach of practical training in the field, as ornithology is not taught in Libyan universities yet.

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public, …)?

TV, Radio, Press are widely used to make public aware about birds and other forms of endangered wildlife. NGO's still in primitive starts, but growing.

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

In future there may be an AP on breeding population of *Sterna bengalensis*, but also on some other breeding species.

5.2. How does your country assess the working-out of these plans?

5.3. Did your country ratify the AEWA Agreement?

YES, Libya is an active member in AEWA, and lately worked as representative to North Africa in AEWA TC.

II.3. LIBAN

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

YES: Only bird species but not habitats (Hunting Law: Law no 580 dated 25/2/2004, Article 4, and Paragraph B). This law is not implemented yet since it requires the issuance of its implementation decrees, knowing that hunting is prohibited since 1998 till date.

1.2.a. Did your country implement any legislation or regulations to forbid or regulate :

- the taking of birds?

YES: Law No : 580, dated 25/2/2004 forbids the taking of birds except for scientific researchers who are allowed to capture birds for research reasons on the condition to release them back to the wild alive and unharmed and based on a special license.

- birds trade?

YES: Law No 580, dating 25/2/2004 dealing with the trade of hunted birds.

- birds hunting?

YES: Law No 580, 25/2/2004 that regulates hunting practices including defining hunting season and its locations and bird species permitted for hunting.

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

One to two months jail and/or 666 US dollars and cancellation of the hunting License for 1 to three years (Articles 13, 15 and 16 of the Law no. 580).

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea, …) for the protection and management of bird species and habitat?

NO: However a contingency plan for marine pollution is underway to be developed as a result of the Oil spill incident in Lebanon resulting from 2006 conflict.

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

NO. However the introduction of alien predatory species is forbidden in Nature Reserves.

1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

Four habitats: 1) Palm Islands Nature Reserve (SPA, Ramsar Site, IBA), Tyre Coast Nature Reserve (Ramsar Site,), Damour and Naqoura.

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

Yes: At Palm Islands Nature Reserve (SPA, Ramsar Site, IBA), Tyre Coast Nature Reserve (Ramsar Site,).

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

NO

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

Following the oil spill incident in 2006, the priority was given to researches on the impact of the spill on bird species, in 2007 the priority was given to the impact of Climate change and helping birds to adapt to climate change.

3.2. What activities supervising wild birds and habitat did your country undertake?

Patrolling and bird watching within Nature Reserves.

3.3. Did your country organise any exchange of data with other countries or appropriate organisations?

Exchange of data is conducted within the framework of AIWA Agreement and related international and regional meetings.
In addition, data is exchanged through the rare publications in scientific journals or through "BirdTalkLebanon"birdtalklebanon@yahoogroups.com <birdtalklebanon@yahoogroups.com>.

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?
A training manual was prepared to assist rangers at Palm Islands Nature Reserve on bird monitoring.
Training on protection and management of protected areas is an ongoing activity most often facilitated by the Ministry of Environment through various projects.

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public, …)?

These activities are executed through conduction of workshops and production of posters and leaflets.

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

No

5.2. How does your country assess the working-out of these plans?

5.3. Did your country ratify the AEWA Agreement?

YES: in 13/6/2002

II.4. TURQUIE

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

-Yes, It has..Turkey has over 135 of international importance wetlands, 12 of Ramsar sites and over 80 wildlife protection areas.
-Regulations under Ramsar Convention and Terrestrial Hunting Law (Law no: 4915)

1.2.a. Did your country implement any legislation or regulations to forbid or regulate:

- the taking of birds?- -Regulation on keeping, breeding, trade of game and wild animals, and keeping, producing, & trade of their derivates under Terrestrial Hunting Law (Law no: 4915)
-Decisions of Central Hunting Commission

- birds trade? CITES and Regulation on keeping, breeding, trade of game and wild animals, and keeping, producing, & trade of their derivates under Terrestrial Hunting Law (No: 4915)

- birds hunting? -Decisions of Central Hunting Commission

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

-Terrestrial Hunting Law (No: 4915)

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea, …) for the protection and management of bird species and habitat?

-Regulations on Wetland under Environment Law (No: 2872)

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

-Regulation on keeping, breeding, trade of game and wild animals, and keeping, producing, & trade of their derivates under Terrestrial Hunting Law (No: 4915)

1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

–12 of Ramsar areas are important habitat areas for bird species and there are records of birds. Also some NGOs has work on some habitats and did inventory for some habitats (as Important Bird Areas)

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

-Especially NGOs carry out

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

–Yes it did. Environmental Impact Assessment is asked for during building up of wind energy stations, electricity transmission line projects.

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

-Turkey gives an importance research priorities primarily on Ramsar sites to make management plans.

3.2. What activities supervising wild birds and habitat did your country undertake?

-Government quards control activities on bird habitat also birds. And now Turkey set up new data base on biodiversity (National Noah's Ark Biodiversity Database) (fauna and flora including birds)

3.3. Did your country organise any exchange of data with other countries or appropriate organisations?

Some NGOs is organizing any exchange data with other countries or organizations.

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?

-Yes, it does under National Noah's Ark Biodiversity Database. And also some staffs are educated to eradicate Bird flu disease.

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public, …)?

- Ministry of Environment and Forestry, NGOs attempt to increase public awareness for Hunters, decision makers etc. Wildlife department organises hunting courses in all provinces of Turkey to raise conscious hunting. Some programmes are prepared and published on TV, radios, also leaflifts, brochures are prepared by Government also NGOs.

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

-Turkey has some management plans on some Ramsar sites and Wildlife Protection Areas and activities are going on.

5.2. How does your country assess the working-out of these plans?

-Every year plans are evaluated with central government and local government..

5.3. Did your country ratify the AEWA Agreement?

-Turkey is not member of AEWA.

II.5. BOSNIE HERZEGOVINE

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

Theorticaly we have signed different protocols etc. but practicly we are not implenet it.

1.2.a. Did your country implement any legislation or regulations to forbid or regulate :

- the taking of birds?
no
- birds trade?
no
- birds hunting?
We have low but implementation is realy bed.

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

500-10.000 Euro

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea …) for the protection and management of bird species and habitat?

you can find in different lows some regulations (e.g low of wathers)

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

yes
1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

yes and no. You have this in lows or strategy but just NGO ornithological society “Naše ptice” praticly work on this.

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

very rare. Some projects like ecowiliges wich include bird watching

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

yes and no. You have this in lows or strategy but praticly no.

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

we have strategy for biodiversity and protection of environmental on different levels. This is more theoretically in practice usually work NGO and very small project of institution (Museum of B&H and Museum of Republica Srpska)

3.2. What activities supervising wild birds and habitat did your country undertake?

Some projects is actually in this moment (e.g Balkan vulture action plan), collaboration with different organization and some small projects of institution (e.g Sava river) which include bird research useful for protection.

3.3. Did your country organise any exchange of data with other countries or appropriate organisations?

Just NGO Ornithological society “Naše ptice” (Our birds) have collaboration with BirdLIfe, EURONATUR, BVCF and other bird’s organization and exchange data. Museums exchange some data but it has a little project so data is poor.

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?

No. Only NGO Ornithological society “Naše ptice” (Our birds) try make some program for education for monitoring.

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public, …)?

No. Only NGO Ornithological society “Naše ptice” (Our birds) try make actions for public.

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

No

5.2. How does your country assess the working-out of these plans?

No

5.3. Did your country ratify the AEWA Agreement?

In progress

II.6. ESPAGNE

1. Questions on the protection of bird species and habitat

1.1. Has your country implemented a policy insuring bird species (and habitat), covered by the Protocol, protection and management?

Yes (Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad)

1.2.a. Did your country implement any legislation or regulations to forbid or regulate :

- the taking of birds?

Yes (Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad)

- birds trade?

Yes (Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad)

- birds hunting?

Yes (Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad)

1.2.b. What are the main penalties in case of non respect of this legislation and regulations?

In addition to jail penalties, the national economy fines can reach an amount of 2.000.000 Euros, amount that can be higher if a regional governments starts court procedures.

(Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad + Ley 26/2007, de 23 de octubre, de Responsabilidad Medioambiental)

1.3. Did your country implement any legislation or regulations to prevent a major threat (oil spills, chemical pollution of the sea, …) for the protection and management of bird species and habitat?

Yes, in addition of developing the international regulations coming for the International Maritime Organization, Spain has developed specific national and regional instruments such as Contingency Plans for marine and coastal areas. Furthermore, nowadays Spain is in the process of developing a new National Law for Maritime Navigation where all of these aspects will be undertaken.

1.4. Does your country have any legislation forbidding the introduction of alien predatory species?

Yes (Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad)

1.5. Did your country work out inventories of important habitat for the species covered by the Protocol?

Yes. SEO/BirdLife, with the support of the Spanish Government, has an Inventory of marine Important Bird Areas (IBA).

2. Questions on the management of human activities

2.1. Do you have any such things as programmes or initiatives concerning ecotourism?

Yes, many initiatives undertaken by the tourism sector including bird ecotourism.

2.2. Did your country assess the environmental impact on bird species covered by the Protocol by activities which could endanger the habitat or protected areas important to those species?

Yes (Ley 42/2007, de 13 de diciembre, del Patrimonio Natural y de la Biodiversidad + Real Decreto Legislativo 1/2008, de 11 de enero, de evaluación de impacto ambiental de proyectos).

3. Questions on the means of study and monitoring of wild bird species

3.1. How did your country identify research priorities?

Since 1998, exists a monitoring scheme which include several projects (each project focusing in different bird groups). The results are very useful to identify both conservation measures and research priorities.

3.2. What activities supervising wild birds and habitat did your country undertake?

(See question 3.1). Programs on wild birds monitoring, at a national level: SACRE, NOCTUA, PASER and species-specific monitoring programs. All of these programs are funded by the Spanish Ministry of the Environment, and Rural and Marine Affairs, and are carried out by the Spanish Ornithological Society (SEO/BirdLife)
http://www.seo.org/programa_ficha.cfm?idPrograma=3

3.3. Did your country organise any exchange of data with other countries or appropriate organisations?

Yes. Spain share information with the European Union, and hence, with all the EU Members. Also, relevant information regarding birds is submitted to BirdLife International. All information obtained from bird's management programs is online and published.

4. Questions on education and information measures

4.1. Does your country offer any specific training for the staff in the field of the monitoring, the protection and management of protected areas that are important to the birds?

Yes, Regional and National Authorities organised training courses for Environmental Rangers.

4.2. What did your country attempt to raise the public awareness of endangered birds and habitat towards the main protagonists (hunters, fishermen, decision-makers, public, …)?

All stakeholders are involved on every decision or initiative. The Advisory Council for the Environment includes NGOs, hunters, fishermen, etc.

5. General issues

5.1. Does your country work out specific Action Plans for some endangered species and habitat?

Yes, Spain has specific Management Plans for several bird species, for example Puffinus mauritanicus and Larus audouinii.

5.2. How does your country assess the working-out of these plans?

The Management Plans includes monitoring initiatives, based on the different protection categories.

5.3. Did your country ratify the AEWA Agreement?

Yes.

ANNEXE II : Références bibliographiques utiles

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United Nations Environment Programme
MEDITERRANEAN ACTION PLAN
Regional Activity Centre for Specially Protected Areas

« Study Reference »

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- *Assistance technique à la mise en place des premiers éléments d'un cadre juridique concernant la création d'aires protégées marines et côtières en Tunisie* (BRL Ingénierie) (janvier et mai 2001) ;
- *Audit d'organisation du département de l'environnement du Royaume du Maroc (MATUHE), Diagnostic et propositions d'optimisation à attributions et moyens constants*; Ambassade de France à Rabat (SCAC) (mars 2002).
- *Séminaire d'échanges méthodologiques sur l'élaboration de démarches partenariales dans le domaine de l'environnement* (Ministère français des Affaires Étrangères) (avril 1998) ;
- *Environnement : assistance juridique et institutionnelle pour le Royaume du* Maroc (Life Pays Tiers) (1997-2001) ;
- *Élaboration d'un cadre juridique et institutionnel en matière de gestion des risques naturels et technologiques pour le Royaume du Maroc* (Life Pays Tiers) (1997-2001) ;

Annex XII - Draft Guidelines for reducing by catch of seabirds in the Mediterranean region

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EXECUTIVE SUMMARY

Scientific evidence points to by-catch as the main cause for population decline in many seabird species around the world. Seabirds have become increasingly dependent on their association with fisheries for individual survival and breeding success. In so doing, they are augmenting the risk that they become injured and/or die and that their populations decrease as a result.

Mediterranean fisheries, where they have been investigated, have been found to cause seabird by-catch in relevant numbers.

A risk assessment of seabird-fishery interactions for the Mediterranean region is undertaken (Table II) and shows that shearwaters (*Calonectris diomedea*, *Puffinus mauretanicus* and *P. yelkouan*) are the species most at risk, and that longline fisheries represent the most immediate threat, although mortality probably occurs in trawling fisheries as well. Shearwaters are also the species of highest (global and regional) conservation concern.
Other species and other fisheries are also of concern and should be addressed. Longlining and trawling pose a threat for *Larus audouinii* and other Mediterranean endemics, as well as for species which occur as winter visitors. Of these, *Alca torda* is known to suffer mortality in gillnets (trammel).

Phalacrocorax aristotelis desmarestii, the Mediterranean Shag, suffers significant mortality in various fisheries, including gillnets/trammel nets and recreational fisheries form the coast. Ringing recoveries reveal that >40 % of its recorded mortality is related to fishing activities.
Several mitigation measures have been developed in various fisheries around the world and have proven to be effective in reducing by-catch to negligible levels. Best practice recommends a combination of measures, because considerable testing has shown that a suite of measures is the best way in most cases.

In longline fisheries, bird-scaring lines, night-setting and line-weighting have shown the best results, often in combination between them or with other measures such as area/seasonal closures, management of discards and underwater-setting devices. Some such measures are species-/ or fishery-specific, and a combination of „column A' & „column B' measures is proposed for the Mediterranean region.

In trawl fisheries, management of offal/discards and bird-scaring lines are widely recognized as effective means of reducing bird strikes on trawl warp cables. Other measures, such as net-binding and net-weighting are also analysed and proposed.

There are currently no best practice measures for reducing by-catch of seabirds in gillnet/trammel net fisheries, but visual and acoustic signals have been proposed in other seas. They, or other measures, should be trialled in the Mediterranean, where interactions with gillnet fisheries account for significant mortality of some species.

Mediterranean States are called to assess their fisheries and to identify whether they have a seabird by-catch problem. This process has been undertaken by other Nations in other seas, who have moved from initial denial to complete participation and sharing of the problem in

international forums. The precautionary principle needs to be applied whenever there is even slight evidence of mortality, and implementation of mitigation measures should be started without delay.

Observer programmes are fundamental to obtain data on species composition and temporal-spatial occurrence of by-catch. Scientific observers on board should receive proper training on species identification and use of mitigation measures. Their data collection protocols should follow the standards of appropriate RFMOs, such as ICCAT or GFCM, so that they can be shared and interpreted in international forums.

Innovation and research to improve current design of mitigation measures remains an important task. Specific adaptations may be required in areas where particular fishing techniques and seabird species overlap, so trials should be favoured wherever they are practicable. This inevitably requires the involvement of the fishing industry, researchers and resource managers, in a context of collaboration and sharing of experiences.

Monitoring of seabird numbers in their breeding grounds on land should be done regularly. Demographical data on seabird populations and their performance (survival, reproduction) can provide the best indication of success towards the goal of making fisheries sustainable and compatible with the conservation of biological diversity.

Several international conventions are relevant to the conservation of seabird populations, as part of the marine environment, in the Mediterranean region. The Barcelona Convention and the UNEP-Mediterranean Action Plan, the Agreement on the Conservation of Albatrosses and Petrels and the African-Eurasian Waterbird Agreement provide guidance and tools, and promote the collaboration of States at different levels. Participation at RFMOs such as ICCAT and GFCM facilitates the collection and exchange of data, and prompts appropriate management. The GFCM Scientific Advisory Committee, through its Subcommittee on Marine Environment and Ecosystems (SCMEE) maintain close collaboration with RAC/SPA on issues such as discards and by-catch of species of conservation concern.

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INTRODUCTION

The incidental mortality of seabirds as a result of their interaction with fisheries has received much attention by scientists, conservationists, policy-makers and government officials, worldwide, in the last two decades. Today, it is recognised as a major issue in the sustainability of fisheries and the UN Food and Agriculture Organization, FAO, has adopted an International Plan of Action to address seabird by-catch in longline fisheries (FAO, 1999). More recently, the FAO Committee on Fisheries has endorsed the conclusions of the expert consultation on Best Practice Technical Guidelines (FAO, 2008), which recommend that mitigation measures be incorporated to trawling and gillnet, as well as to longline fisheries, in order to make commercial fishing sustainable and compatible with the long-term conservation of seabird populations.

Since the first scientific evidence of by-catch was provided by Brothers in 1991(Brothers, 1991), mortality of seabirds at sea has been shown to be a serious environmental problem that is responsible for many declines in seabird populations, putting some of them literally on the verge of extinction (BirdLife International, 2008). In parallel, many researchers and seabird experts have devoted significant amounts of their time to the design of ways, devices and innovations with a view to correcting the negative consequences of the interaction between seabirds and fishing activities. The situation is most unwanted because it does not benefit anyone: killing birds is only the shameful result of an otherwise desirable human activity that provides healthy protein for human nourishment. Commercial and artisanal fishing are both impaired by the incidental capture of birds, instead of the target species, in their gear: there are important losses in terms of bait, fishermen's time and the overall image of their activity.

The last few years have seen the development of joint initiatives, by the authorities, the fishing industry and the scientific community, geared at improving our understanding of how the interaction occurs and at securing the continuity of fishing without a serious impact on the marine ecosystem. Almost certainly, the fishing of future decades will be done in a way that is totally, or mostly, „seabird friendly'. The question is how to achieve those quality standards in the shortest time possible, so that seabird populations –subject to various other types of threat: destruction of habitat, pollution, disturbance– do in fact survive into the new times in sufficient numbers (and with enough genetic variability) to guarantee their continuity in the long term.

Somehow, this process is going more slowly in the Mediterranean region. In this highly humanised sea, where many fishing methods (including longlining, trawling and gillnetting) were invented, only limited attention has been paid so far to the interactions between seabirds and fishing vessels, and to the risks that they involve. The time is right, though, to address the issue at the beginning of the XXI century. Enough information is already available on how to avoid/prevent the interaction and its negative effects. What is known from bird populations, and their evolution, points at by-catch posing a serious threat to the preservation of this visible component of Mediterranean biodiversity, our common heritage.

PART ONE – THE PROBLEM

Seabird interactions with fisheries

Seabirds interact with fisheries in a number of ways. Some of those interactions inevitably result in the birds getting caught in fishing gear. Many of the birds caught then die or become seriously injured, and are lost to the population. Scientific evidence points to by-catch as the main cause for decline in many seabird species around the world (BirdLife International, 2004; FAO, 2008; Mínguez *et al.*, 2003; Reid & Sullivan, 2004; Ryan & Watkins, 2008).

Considerable research has centred on trying to avoid the negative consequences of seabird interactions with fisheries. Work on by-catch is being conducted at several levels:

a) prevention – keeping seabirds away from vessels and/or dangerous gear
b) mitigation – reducing the risk of death/injury when seabirds enter in contact with dangerous gear
c) rescue – freeing individual seabirds caught alive (see Appendix I)

Along with this, any serious attempt to reduce seabird by-catch must be embedded in the framework of a wider seabird conservation policy. Other essential elements of this are: the involvement of the fishing industry, an outreach programme for the wider public and the collection of long-term series of scientific-based data.

Still, the essence of the problem remains very simple: birds are attracted to fishing vessels, which –they have learnt– may be a reliable source of a free meal. This extra food may make the difference, and often seabirds have no choice. Fishing methods –on the other hand– were not designed to avoid catching birds, so the inevitable occurs sooner or later, at varying degrees depending on the area, time of year and the species involved. The ecological consequences also differ.

It is not realistic to expect that seabirds will learn, by themselves, that associating with fishing vessels may be detrimental for their populations. Some species are actually benefitting from their association with humans and, although they too lose some individuals, their overall numbers have increased. The problem lies with the rarer species.

Have seabirds stopped to feed „naturally'? Not, as long as we know. But their chances of locating sources of abundant food have diminished as ecosystems have become simpler and the populations of tuna and dolphins have become smaller. These predators were „natural' gatherers of fish schools, which they drove to the surface for seabirds to exploit in large flocks (causing havoc and thus making it easier for tuna and dolphins to catch). Such multiple-species temporal aggregations still occur, but are a rarer event in the gradually impoverished seas of the XXI century.

So, seabirds have become increasingly dependent on their association with fisheries for their individual survival and breeding success. But, in so doing, they are augmenting the risk that they will become injured and/or die and that their populations will decrease as a result. It is proving difficult, and a good deal of effort and commitment are needed, to break that circle.

Seabird by-catch in the Mediterranean region – the facts

Mediterranean fisheries are no exception and, where they have been investigated, have been found to cause seabird by-catch in relevant numbers. Evidence has been shown mainly for longline fisheries: Cooper *et al.* (2003) compiled data pointing at unsustainable catch rates for Cory's shearwater *Calonectris diomedea*, in all probability the most affected species, particularly in Spain. Subsequently, important by-catch rates have been found also for the other shearwater species in longline fisheries operating in Malta, France and Italy, as well as in Spain (Bourgeois & Vidal, 2008; Carboneras *et al., in press*; Dimech *et al.*, 2008; Dunn, 2007). Table I (Appendix II) summarises the status of seabirds in the Mediterranean region and their occurrence by country. In Table II (Appendix II), the first risk assessment of seabird-fishery interactions for the Mediterranean region can be found.

Byctach in longline fisheries is known to affect other species, apart from shearwaters. These include species of global/regional conservation concern, such as the Mediterranean endemics Audouin's *Larus audouinii* and Mediterranean gulls *Larus melanocephalus*, and species most commonly found in other regions that also use the Mediterranean in winter: Northern gannet *Morus bassanus*, Great skua *Catharacta skua* (Belda & Sánchez, 2001; Cooper *et al.*, 2003; Dunn, 2007; Guallart, 2004). Species of least concern, such as Yellow-legged gull *Larus michahellis*, also get caught in significant numbers.

Data on seabirds taken to recovery centres in Mediterranean countries also reveal that recreational fishing (angling from harbours or from boats, including trolling such as in „curricán') is not a minimal source of further by-catch. It has been recorded in *Calonectris diomedea*, *Larus audouinii* and, most importantly, in Mediterranean Shag *Phalacrocorax aristotelis desmarestii*.

Band recoveries of ringed birds are a general source of objective data. The information they provide is not unbiased, as birds that are found in circumstances related to human activities have a higher probability of being reported. Four species, however, stand out as having unusually high (above 40 %, as opposed to 0-10 % in other seabirds) rates of recoveries reported as caught in a trap set for other species (Euring code 34: a*ccidentally trapped where the intention was to trap other species of birds or vertebrates, eg in fish nets or on a fist hook while the nets or hook were being used to catch fish*). Those species are:

- Cory's Shearwater *Calonectris d. diomedea*: mostly caught in longlines (pelagic & demersal)
- Balearic Shearwater *Puffinus mauretanicus*: mostly caught in longlines (demersal)
- Mediterranean Shag *Phalacrocorax aristotelis desmarestii*: mostly caught in gillnets and traps
- Razorbill *Alca torda*: mostly caught in gillnets

Current knowledge in the Mediterranean does not extend to trawl fisheries as a proven source of by-catch. Trawling, however, is the main method used in commercial fishing in the region, where it is also the main producer of fish offal and discards (Arcos, 2001; Bozzano & Sarda, 2002; Martinez-Abrain *et al.*, 2002; Oro & Ruiz, 1997). No studies have compared the relative numbers of seabirds attracted to the different types of fishing vessels, although it is common knowledge that trawlers produce large assemblages. Trawling is known to cause significant by-catch of albatrosses and other seabirds off southern Africa and in the

Patagonian shelf (Barnes *et al.*, 1997; BirdLife International, 2004; Croxall, 2008; Gonzalez-Zevallos & Yorio, 2006; Ryan & Watkins, 2008; Sullivan *et al.*, 2006; Watkins & Ryan, 2008). Research is being conducted, in the Mediterranean region, on the causes of certain types of injuries found in seabirds, as they may most probably relate to fishing gear used for trawling.

The precautionary principle

Where potentially dangerous effects of a process affecting the environment have been identified but scientific evaluation does not allow the risk to be evaluated with sufficient certainty, the precautionary principle applies (Commission of the European Communities, 2000). We know that enough seabird species in the Mediterranean region are of conservation concern and that interaction with fisheries has been identified as a potential threat for most of those species (UNEP - MAP - RAC/SPA, 2003) to merit immediate action.

In order to preserve the current diversity in the seabird communities in the Mediterranean region, it is probably wise to put in practice a suite of the mitigation measures developed elsewhere and which are known to reduce levels of by-catch to those that can be tolerated by the species concerned. Some of those methods have also been tested in the Mediterranean with good results.

In parallel with the immediate implementation of mitigation measures, the precautionary principle should lead to the development of comprehensive, scientific-based action plans, following the recommendations of the FAO Code of Conduct for Responsible Fisheries which promoted, among others, the International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds). At the national level, it is recommended that countries develop their own national plans of action (NPOA-Seabirds) and adopt a more proactive attitude, participating in international treaties (such as the Agreement on the Conservation of Albatrosses and Petrels ACAP, of interest for the three Mediterranean shearwater species, *Calonectris* and *Puffinus*) and Regional Fisheries Management Organizations, or RFMOs, contribute their statistics on seabird by-catch to these fora and put into practice on-board observer programmes for the collection of scientific data.

Mediterranean seabirds in context – the importance of endemic taxa

The Mediterranean region is a well-known source area for endemism at several biological levels, from plants to mammals (Margalef, 1985; Zotier *et al.*, 1999). Seabirds are a particularly good example of the region's richness and diversity in biota – eight of the nine breeding taxa of exclusively marine birds are either endemic species or subspecies (Zotier *et al.*, 1999). This datum alone summarises the importance of the Mediterranean Sea: a relatively poor environment with comparatively harsh conditions and that has been in isolation long enough to force the development of new forms of life.

Mediterranean seabirds have a long history of coexistence with man and its consumption of natural resources (Oro, 2003). This is reflected in the current distribution of species and their numbers. However, the levels of threat that they are facing at present as a result of their interaction with fisheries may be overtly unsustainable. If no remedy is put, they would lead to the definitive extinction of these highly specialised, unique forms that are part of the Mediterranean heritage.

PART TWO – HOW TO AVOID/REDUCE SEABIRD BY-CATCH IN THE MEDITERRANEAN REGION

Avoid, reduce, minimise

The ultimate goal of these Guidelines is to contribute to make fishing, as we know it, be compatible with the long-term conservation of seabird populations. To reach that goal, it is necessary that seabird by-catch in the Mediterranean region remains as close to zero as possible. Or, in other words, by:

- avoiding seabird by-catch, *i.e. catch rates = 0*
- minimising seabird by-catch *i.e. catch rates ≈ 0*
- reducing seabird by-catch *i.e. catch rates* t_1 > *catch rates* $t_2 \geq 0$

Experience has shown that it is not always possible to reach the desirable *„by-catch = 0'* goal. When this happens, best practice should be directed towards minimising the impact, or at least, reducing it to levels that the seabird populations can sustain.

This can only be achieved through the use of mitigation measures. However, although we know that mitigation measures serve the purpose of avoiding/minimising/reducing by-catch, there is evidence that no single mitigation method is in fact fully effective. Best practice recommends that a combination of methods is used simultaneously (Agreement on the Conservation of Albatrosses and Petrels, 2008; FAO, 2008; Løkkeborg, 2008). The specific combination will depend on such factors as the target fishery, gear used, location and suite of seabird species encountered, and sea conditions. Furthermore, this may need to be fine-tuned on an individual vessel basis to optimise performance (Bull, 2007a).

Mitigation measures for longline fisheries – column A & column B

At the individual level, skippers of fishing vessels must choose a suite of the mitigation measures that they will put in operation to avoid/reduce seabird by-catch during every fishing trip. They should have in place *at least 2* mitigation measures in any of the following combinations:

- at least *one* measure from column A *plus* at least *one* measure from column B
- at least *two* measures from column A

Column A	Column B
[Longlining] ▪ **night setting** ▪ **bird-scaring lines** ▪ **line weighting** ▪ **under-water setting**	**[Longlining]** ▪ offal and discard management ▪ area/seasonal closures ▪ bait condition (incl. blue-dyed) ▪ line shooter

Below follows a more detailed review of the mitigation measures developed in the last decades by the scientific, managerial and fisheries communities and which have been proven to be effective in reducing seabird by-catch in concrete longline fisheries:

Night-setting (column A)

How it works

Birds are mostly visual predators, so fewer actually feed actively at night. Observations in virtually all oceans (except in the poles) confirm that fewer seabirds attend fishing vessels in total darkness. The number of attempts at stealing fish bait in longline fisheries is also significantly lower at night, possibly because they also find it more difficult to locate potential prey. Overall, the risk is reduced for most species and fishing areas.

Night-setting is easier to adopt, as a mitigation measure, in commercial fisheries that operate far from their port of reference. For fisheries where trips are 1-3 days long, it may require important changes in key habits (*e.g.* timing of fish auctions, fishermen's activities on land). These may be worth the while, though, because the reduction in seabird by-catch may be substantial.

How it can reduce seabird by-catch in the Mediterranean region

Night-setting has been shown to be an effective method to reduce seabird by-catch in longline fisheries, both pelagic and demersal, in Mediterranean waters in Spain (Belda & Sánchez, 2001) where Cory's shearwater *Calonectris diomedea* was the most affected seabird species. Fewer shearwaters associated with the fishing vessels when the line was set at night; the largest aggregations occurred around sunrise. By-catch rates were also highest around sunrise and sunset, so these are the periods to be avoided according to the authors. The lowest risk occurs in total darkness, as it has been shown also for other seas (Belda & Sánchez, 2001; Bull, 2007a; Guallart, 2004; Løkkeborg, 2008).

It is the light that affects seabird presence and by-catch rates, so there is a relatively higher risk in nights with full-moon phase (Bull, 2007a).

Recommendations

In order to maximise efficiency, it is important to ensure that decklights have been turned off and that illumination (especially, on deck) is limited to those lights necessary for navigation and for health & safety standards (Løkkeborg, 2008).

Also, when setting the longline at night with reduced lighting, fishermen must make sure that they do not face greater risks and, when appropriate, should incorporate additional protection so as not to injure themselves.

Night-setting may need to be used in combination with other mitigation measures (additional weighting, bird-scaring lines, etc.) to achieve 100% efficiency in reducing seabird bycacth.

The fact

From Dunn, E. (2007():

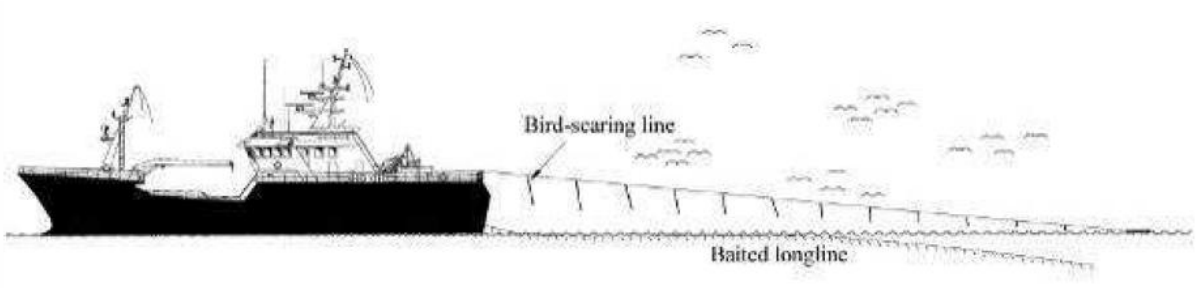
"On the basis of this collaboration [between the Regional Government of Galicia, Puerto de Celeiro, S.A. and SEO/BirdLife], in October 2006 an observer (Álvaro Barros) undertook the first of a series of seven trips to the Gran Sol (SW Ireland) to assess the impact of the Galicia longline fishery on seabirds. The purpose of this project is to study the spatial and temporal interaction between the fishery and seabirds (i.e. in all seasons, inshore and offshore).

The first observations, reported in December 2006, were conducted aboard the vessel „Breogán Uno' *between 14 and 26 October 2006, a 16-day trip including 10 fishing days to the Gran Sol (about 160 kms offshore: between 53°55' N-12°30' W and 53°055' N-12°56' W), targeting mainly hake* Merluccius merluccius *and black bream* Brama ramii*. Each day, the vessel set 10,200 hooks along 15-20 kms. Of the total of 98,545 hooks set during the whole fishing period, 8496 (9%) were monitored.*

The main seabird species accompanying the fishing activities were northern fulmar Fulmarus glacialis *and great shearwater* Puffinus gravis*. In total, 121 birds were caught on the longlines, comprising 116 (96%) great shearwaters, 4 fulmars, and 1 sooty shearwater* Puffinus griseus*, a by-catch rate of 14.2 birds per 1000 hooks. An additional 20 birds (19 great shearwaters, 1 sooty shearwater) were caught during line-hauling (while attacking hooked fish) but were released alive.*

Setting was at night and at dawn, and by-catch was strongly associated with the use of deck lighting during the first six days. After the sixth day, the observer requested that – as a control – no deck lighting be used and in the four fishing days that followed, only 2 birds were caught. When the lights were on, 119 birds (98% of the total) were killed, an average of 20 birds a day. If this by-catch rate applies to all the hooks set, and not just those observed, then 240 birds would have been caught per day. By-catch rates were highest at dawn when the birds were most active."

Bird-scaring lines (column A)



The bird-scaring line (from Løkkeborg 1998 and 2008)

How it works

Bird-scaring lines (also known as *streamer lines* or *tori lines*) have been designed to keep seabirds a distance away from moving vessels. They try to prevent hungry seabirds from entering the aerial space astern of the vessel and extending to at least 90-100 m. It is in this area where seabirds are most at risk and may interact with dangerous gear that is within their capacity to reach by diving, plunging or swimming; further away, fishing gear is generally below water and remains out of reach of most seabirds.

Research has shown that birds get scared by the combined effect of the aerial line, the streamers and the buoy being towed on the water. Most flee and keep at a distance that becomes crucial. Researchers have agreed to a „best practice' design that has been achieved by trial-and-error by many people over nearly two decades in several oceans and in many sea conditions (Melvin et al., 2001). Appendixes III & IV contain two examples of this design: that annexed to Recommendation [07-07] by ICCAT on reducing incidental by-catch of seabirds in longline fisheries and

Conservation measure 25/02 of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

The deterrent effect of bird-scaring lines is increased by using two („paired') lines, one on each side of the stern and the fishing gear being operated in-between. This practice is recommended to large fishing vessels operating in waters where large seabirds are common. It is *e.g.* compulsory for longline vessels >24 m-long in CCAMLR waters (Melvin, 2004).

How it can reduce seabird by-catch in the Mediterranean region

Bird-scaring lines have proven to be successful mitigation measures in fishing grounds where large seabirds (particularly albatrosses, petrels, shearwaters and gannets) congregate astern of the vessels in large numbers (FAO, 2008; Løkkeborg, 2008). They are most effective when used in combination with another mitigation measure (e.g. night setting, increased line weighting). In the Mediterranean region, where shearwaters are of highest conservation concern, bird-scaring lines can contribute to effectively reducing seabird by-catch in the areas where they overlap.

Of the Mediterranean seabird species that suffer by-catch in longline fisheries, some species like *Calonectris diomedea* and *Larus audouinii* are mostly aerial and do not dive to great depths. In the fisheries where these species are predominant, the use of bird-scaring lines, preferably in combination with other mitigation measures, may significantly reduce the rates of by-catch. The situation could be different in waters where *Puffinus* shearwaters occur in relevant numbers. In those fisheries, bird-scaring lines may not be such a successful bird deterrent, because both *P. mauretanicus* and *P. yelkouan* are excellent divers and may easily reach considerable depths, thus being able to access baited hooks even some time after they have started to sink.

There is some geographical and technical separation between the two types of fishery mentioned in the above paragraph. The first type, where *Calonectris diomedea* and *Larus audouinii* abound, corresponds mostly to pelagic longlines set for tuna and swordfish far from the coastline. Bird-scaring lines may prove very effective in these (Belda & Sánchez, 2001; Guallart, 2004). The second type, demersal longlining for hake and other white fish, occurs mostly in waters close to the coastline, where *Puffinus* shearwaters are most common in the appropriate regions. There are no studies on the performance of bird-scaring lines in relation to these species, but it seems *a priori* that it may not function as well as for other species. For this case, it is highly recommended to use bird-scaring lines in combination with line-weighting (see below), which is designed to make the line sink faster (and, thus, closer to the vessel and to the area where the bird-scaring line works successfully)(Løkkeborg, 2008).

Recommendations

All fishing vessels operating in the Mediterranean should carry at least one (preferably, two) bird-scaring line(s) on board ready for operation and inspection. Crews should train to use them properly and without risks, in different fishing circumstances and sea states.

In the Mediterranean region, the use of bird-scaring lines may be required only in certain areas/seasons that are rich seabird „hotspots' (e.g. near breeding colonies at the time of nesting). For the rest of the region, they may be required only irregularly, when birds are plentiful around the vessel and, therefore, at risk. Or when the same vessel has already caught some seabirds previously, for example. In those conditions, the crew must be able to set up the bird-scaring line(s) promptly and without hesitation, so some previous practice will favour its rapid use and will probably save the lives of some birds.

Bird-scaring lines, particularly when used in pairs, may increase the risk of entanglement with the longline gear (Løkkeborg, 2008). This situation is to be avoided, as in other seas it has been shown to have the opposite of the desired effect: when the vessel stops in order to solve the entanglement, the whole gear may be resting on the water for several minutes, an unwanted situation that may augment the risk of by-catch. It is therefore advisable that crews train themselves or receive some training on the technical aspects of setting the gear and manoeuvring the vessel with the bird-scaring line(s) fully deployed, so that they know which situations to expect and what to do in order to avoid them.

In practice, bird-scaring lines may benefit from some adaptation to the peculiarities of the fishing methods of the Mediterranean and to the suite of seabird species present. Experience gained by local fishermen, and considerable testing, should result in further improvement of the current design in relation to fishing practices in the Mediterranean region and the species present.

The fact

From Løkkeborg (2008):
*"A two-year research programme (1999–2000) comparing seabird by-catch mitigation strategies have been carried out in the two major Alaska demersal longline fisheries; the sablefish (*Anoplopoma fimbria*) fishery and the cod (*Gadus marcocephalus*) fishery (Melvin et al., 2001). This research programme tested single and paired streamer lines, weighted lines, setting funnel and line shooter. A total of 1.2 and 6.5 million hooks were set in the sablefish and cod fisheries, respectively, and 113 and 430 seabirds were caught. The primary seabird caught in both fisheries was northern fulmars [*Fulmarus glacialis*], but short-tailed shearwaters (*Puffinus tenuirostris*) and Laysan albatross (*Phoebastria immutabilis*) were also caught.*
Among the mitigation measures tested, paired streamer lines proved to be the most efficient solution. This device reduced seabird by-catch by 88–100 percent relative to controls with no deterrent. Thus paired streamer lines virtually eliminated the catch of surface foraging seabirds, and they were efficient in all years, regions and fleets despite the fact that seabird by-catches varied by orders of magnitude across years and among regions. Single streamer lines were slightly, but not significantly less effective than paired streamer lines, and reduced seabird by-catch by 71 percent and 96 percent in the cod and sablefish fisheries, respectively."

Integrated and external line weights (column A)

How it works

Adding some extra weight to the longline makes it sink faster. This reduces the time that the baited hooks are on or close to the surface, and are thus available for seabirds to prey upon. There are two main ways of adding weight to the line: tying stones, metal pieces or other external weights to the mainline, or by incorporating strands of heavy-weight materials (*e.g.* lead) when manufacturing the mainline. The second option is cleaner and easier to use but may be more expensive.

By sinking faster, weighted lines also increase the amount of time that the line is "in place" (*i.e.* at the right depth for catching the target species), so fishing is also more effective. Experiments have shown that fishing normally occurs within the first 2 hrs of immersion (Løkkeborg, 2001), probably the period when bait is still fresh and attractive for fish. A reduction in sinking time will make more bait available to fish in optimal condition.

Weighted lines do not solve *per se* the problem of seabird by-catch, but they can make a significant contribution when they are used in combination with other methods (night-setting, bird-scaring lines, management of offal, etc.) (FAO, 2008; Løkkeborg, 2008).

How it can reduce seabird by-catch in the Mediterranean region

Fast-sinking longline gear is safer for seabirds in all oceans, situations and combinations of species. Although little tested in the Mediterranean, there is no scientific reason to hypothesise this mitigation measure would perform differently in this region. Especially when used in combination with other measures, such as night-setting, management of offal and bird-scaring lines.

In parallel with other regions of the world, adding extra weight to the main line is likely to be more effective in demersal longlining set at slow speed. For pelagic longlining, which is usually set at greater speed, some standards require that the extra weight be added to the branch line (*e.g.* Hawaii, Australia). This is probably most effective for areas abounding with albatrosses, which mostly grab their food whilst sitting on the water. For the Mediterranean, where shearwaters are of greatest conservation concern, it is probably advisable to add the weight to the main line, either by attaching it externally or by integrating it in the line itself.

Recommendations

The combined use of weighted lines with effective mitigation measures like night-setting and bird-scaring lines will significantly reduce (or possibly even eliminate) the incidence of by-catch in most Mediterranean fisheries and situations. Weighted lines alone may not be so effective in some circumstances and should not be promoted as a stand-alone mitigation measure.

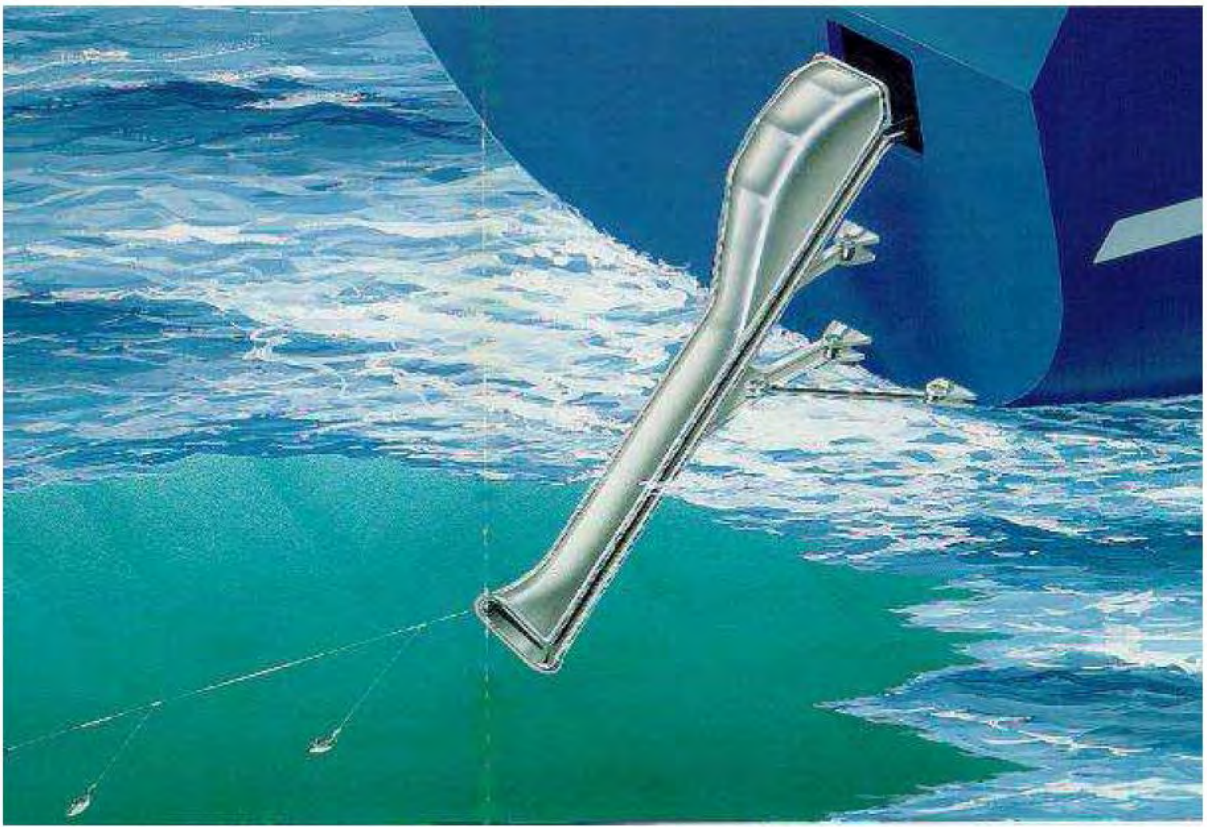
Technology now allows for the use of cheap, simple devices to obtain data on the sinking rate of longline gear set underwater. When this has been tried in other areas (*e.g.* Brazil) the results obtained were surprising even for the fishermen, and provided a new insight into the evolution of the longline gear from the moment it starts to sink until it reaches the seabed(Bugoni *et al.*, 2008). Information provided by this new source should induce some innovation of current fishing methods used in the

Mediterranean and should encourage fishermen to increase line weighting in order to fish more efficiently.

The fact

From Løkkeborg (2008):
*"The potential of longlines with integrated weight to reduce incidental catch of white-chinned petrel and sooty shearwater (*Puffinus griseus*) were investigated in 2002 and 2003 in the New Zealand ling (*Genypterus blacodes*) autoline fishery (Robertson et al., 2006). These seabird species are among the most difficult to deter from baited hooks. White-chinned petrels forage day and night (Weimerskirch, Capdeville and Duhamel, 2000) and are capable of diving to at least 13 m (Huin, 1994). Sooty shearwaters are agile flyers and have deep diving abilities (67 m depth; Weimerskirch and Sagar, 1996). Lines with integrated weight (50 g/m beaded lead core, sink rate: 0.24 m s-1) yielded a 94–99 percent reduction in capture of white-chinned petrels and a reduction of 61 percent for sooty shearwaters in comparison to unweighted conventional lines (sink rate: 0.11 m s-1). No albatrosses were caught in these experiments except a single Salvin's albatross [*Thalassarche salvini*].*
(...)
In addition to reducing the incidental capture of seabirds, weighted longlines may also give increased target catch rates as they reach the seabed more rapidly. The release rate of attractants from baits declines rapidly during the first 2 hours of immersion in seawater (Løkkeborg, 1990), and longlines with sink rate of 0.16 m s-1 (conventional lines) would take 1 h 44 min to reach fishing depth at 1000 m compared to 55 min for a line weighted to sink at 0.3 m s-1 (Robertson et al., 2003). Thus, to maximize bait attractiveness it is advantage to use longlines that sink fast. In addition, lines with integrated weight have superior handling attributes making gear easier to deploy and retrieve relative to traditional unweighted longlines (Robertson et al., 2006)."

Underwater setting devices (column A)



Underwater setting chute (from Løkkeborg 1998 & 2008)

How it works

In recent years, several devices have been developed that guide the gear (main line, branch line, hooks) through some mechanism (capsule, chute, funnel, the hull) and release it under the water, away from the reach of [most] seabirds. Some are more sophisticated than others, but they are all based on similar principles and they all seek to eliminate the aerial phase of the setting operation (i.e. the transition from the stern or side of the vessel into the water and as deep as possible). Seabirds being mostly aerial, the result of the use of these devices is that they reduce the attractiveness of the fishing vessel (the bait is more difficult to detect) and the risk of the birds becoming hooked (the gear is more difficult to access to)(Gilman *et al.*, 2003; Gilman *et al.*, 2007; Løkkeborg, 2003; Melvin, 2001).

Underwater setting devices have been tested in several seas, with varying success. Many only exist in prototype form, but some commercial types are available as well, like the *Autoline Setting Tube*™ manufactured by Mustad Longline A.S. from Norway (http://www.mustad-autoline.com). This and other underwater setting devices have shown some malfunctioning and did not perform as expected when tried on large vessels in rough seas (Gilman et al., 2007; Løkkeborg, 2008). BirdLife International (*in* Melvin & Baker, 2006) recommends further research into trying to overcome the design problems identified before these devices are considered suitable for widespread application.

How it can reduce seabird by-catch in the Mediterranean region

In the Mediterranean, underwater setting devices have been subject to little testing. Even though, they are recommended by some researchers (*e.g.* Guallart, 2004) and might in fact be quite effective, particularly if combined with well-known mitigation measures, such as night-setting, bird-scaring lines and line weighting.

Recommendations

It seems appropriate to undertake some testing of these devices, in controlled conditions and under the scrutiny of scientific observers, in the Mediterranean. Initial tests should be carried out in areas where only the more aerial species (*Calonectris diomedea, Larus audouinii*) occur. Waters that abound with the diving *Puffinus* shearwaters should be left for a second phase of testing, only for the case that the initial trials are successful.

The fact

From Ryan & Watkins (2002):

*"A demersal longline fishery for Patagonian toothfish (*Dissostichus eleginoides*) that commenced off the Prince Edward Islands during 1996 has killed significant proportions of locally breeding albatrosses and petrels. As one of a suite of mitigation measures, we tested the efficacy of a Mustad underwater setting funnel to reduce incidental mortality of seabirds. The funnel, which deploys the longline 1–2 m beneath the sea surface, was used on 52% of 1714 sets (total effort 5.12 million hooks) over a 2-year period. Used in conjunction with a bird-scaring line, overall seabird by-catch rate was low (0.022 birds per 1000 hooks), and was dominated by white-chinned petrels (*Procellaria aequinoctialis*) (88% of the 114 birds killed). By-catch rate was three times lower when the funnel was used both by day and at night. Daytime catch rates with the funnel were less than those attained during night sets without the funnel. In conjunction with other mitigation measures, underwater setting offers a significant reduction in seabird mortality in this fishery and could increase fishing efficiency by allowing*

daytime setting. However, small numbers of albatrosses were caught during daytime sets with the funnel, and its use for daytime sets should be closely monitored."

Offal and discard management (column B)

How it works

The number of seabirds attending a fishing vessel is highly and positively correlated with the amount of food (offal, discards) that is made available to them (Furness *et al.*, 2007; Oro *et al.*, 2004; Weimerskirch *et al.*, 2000). Mitigation consists in decreasing the incentive for birds to follow vessels via a reduction in the amount of food that they can access. This can be achieved, for example, by:

- throwing no offal/discards overboard while at sea when seabirds are present *e.g.* through retention onboard for later disposal
- freezing offal into blocks which can be kept for later disposal or dumped overboard
- blending offal to form a homogenised fluid mass which can be kept or returned to sea, preferably through a pipe or mixed with water

Offal/discard management is an effective method when it results in a net reduction in the amount of food available to the birds. In its simplest form, the skipper can choose to separate the setting and hauling operations (particularly in longline fishing) so that they do not coincide in time or place.

How it can reduce seabird by-catch in the Mediterranean region

Living in a highly humanised environment, seabirds in the Mediterranean region are probably more inclined to become associated with fishing activities than they do in other parts of the world. Therefore, if this direct relationship can be avoided, seabirds will be able to live more independently of man.

It is generally incorrect to assume that seabirds benefit from the extra food that they may obtain by attending fishing vessels: while it is true that they obtain food at low cost at the individual level, it is also true that this causes disruptions at the species and ecosystem levels. The long-term outcome, in ecological terms, is probably negative.

Recommendations

The smaller the number of birds attending a vessel the better. It is mostly the skipper's decision to choose how to make his vessel less attractive for hungry seabirds. Fishing that is more selective on the target species and that extracts less unwanted catches will be both more profitable and better for the environment (Hall & Mainprize, 2005).

The desirable reduction in the amount of discards thrown overboard may involve changing habits and, possibly, increasing the storage capacity in the vessel, so the logistical implications are not minimal (Abraham *et al.*, 2009). However, research is being conducted at various levels to find practical uses for the offal and other biological material now being „returned' to sea with many negative consequences. In

the future, it may be possible to obtain revenue from what is currently being discarded that can compensate for the additional costs of processing, storage and/or transport.

The fact

From Petersen et al. (2007):
"Albatrosses and petrels are opportunistic scavengers and fishing vessels processing at sea and discarding offal provide a feeding opportunity for these birds (Ryan and Moloney 1988). Therefore by minimising or eliminating discards seabirds will not be attracted to fishing vessels. Seabirds are most at risk of being caught during setting (Brothers et al. 1999a) therefore discarding should not take place during this time. If discarding is necessary during hauling, crew should be instructed to do so on the opposite side thereby reducing the risk of capture to the birds. Current fisheries regulations for South African longline fisheries require vessels to dump offal on the opposite side of the vessel from that on which lines are hauled and no dumping of offal may take place during setting. Namibian fisheries regulations prohibit dumping of offal."

Area/seasonal closures (column B)

How it works

The co-occurrence of seabirds and fishing vessels can equally be prevented artificially, through the delimitation of areas where fishing is not allowed:

- in specific seasons of the year
- in specific times of day
- using specific methods

Modern fishing is an intensively regulated activity. Restrictions are mostly aimed at preventing over-exploitation (and damage to the ecosystem) and providing equal access to the resource. Few restrictions have been established and targeted to protect seabirds to this day, but they are becoming an increasingly useful conservation tool in various parts of the world (Bull, 2007a; Løkkeborg, 2008).

Experience has shown that area/seasonal closures are not necessarily followed by economical losses in surrounding commercial fisheries, and that they can be a source of diversity and biological richness that result in long-term profit if managed with the adequate vision and resources.

How it can reduce seabird by-catch in the Mediterranean region

Many seabird species in the Mediterranean region are highly mobile and can travel large distances (up to hundreds of kilometres) in search of food. However, a few small areas in specific times of the year concentrate very large portions of their global populations, and birds may be more vulnerable in those areas. This is particularly true in the vicinity of breeding colonies and in migration „hotspots' (*e.g.* where land topography forces seabird passage to funnel into narrow corridors).

It is difficult to calculate the efficiency of area/seasonal closures as a mitigation measure because it will depend on the species, the distance to the key area and the fishing effort involved. In general, though, one can say that the average fishing will have a higher risk of having a significant impact on seabird populations when it takes

place in the areas of highest seabird presence during the season of peak activity, particularly if no other mitigation is used. For the sake of conservation, fishing in those conditions is to be avoided.

Area/seasonal closures must not be regarded as the ultimate resource when everything else has failed, but it is unquestionable that they need to be imposed in those circumstances.

Recommendations

Accurate knowledge of species' requirements and abundance patterns is required before allocating area/seasonal closures efficiently (Melvin & Parrish, 2001). BirdLife International is currently developing guidelines and can assist in the delimitation of protection areas around seabird nesting colonies, depending on the species and the physical conditions of the place (BirdLife International, 2008). For areas in the open sea, enough data are required that there is a direct link between certain oceanographic/biological features (used to delimit the area) and the presence of seabirds in it; and that a significant reduction of the fishing effort within its perimeter will undoubtedly result in fewer birds being at risk and subsequently caught. Also, any attempt to close specific areas for certain fisheries in the open sea must ensure that it is not coupled with an increase in the fishing effort in their vicinity; otherwise there is a strong probability that birds will simply be transferred to those new areas, where they may suffer similar degrees of risk.

The fact

From Bull (2007a):
"The restriction of fisheries operating in CCAMLR waters to fish only during the winter months has resulted in a decline in the incidental mortality of seabirds from approximately 0.2 birds per 1000 hooks in 1995 to <0.025 birds per 1000 hooks in 1997 (SC-CAMLR 1995, 1998). However, the requirements by CCAMLR for vessels to employ other seabird avoidance methods act as confounding factors, thus making it difficult to determine if any single factor is responsible for the observed reduction in by-catch.
*While investigating methods to reduce seabird by-catch in the coastal salmon (*Oncorhynchus keta*, Salmonidae) drift gillnet fishery in Puget Sound (Washington, USA), Melvin et al. (1999) recorded temporal variation in seabird by-catch and abundance over different temporal scales (interannually, within fishing seasons, and over the day). Due to a reduction in effort (i.e. total sets) to meet the quota, it was estimated that a 43% reduction in seabird by-catch could be achieved by limiting fishery openings to periods of high salmon abundance. Knowledge regarding seasonal/annual variability in patterns of species abundance is required to accurately allocate seasonal/area closures (Melvin et al. 1999)."*

Bait condition: thawed, blue-dyed & other (column B)

How it works

Bait is the main attractor of seabirds to longline hooks and is, therefore, the main driver of risk. By dyeing squid bait blue, it has been proven to be less visible to seabirds, particularly at night. Also, bait (squid or fish) that is thawed sinks faster and more easily than if it is thrown while still frozen. Both these methods have been tested successfully, and may be acceptable to fishermen, because they result in neutral or

increased catch rates of the target fish. The same is not always true of artificial lure used as bait, which is less attractive for birds, but maybe also for fish as well.

The idea of thawed bait is simple, but it may be demanding on space (e.g. on the deck, for the bait to thaw in contact with air) that is not easily available on a vessel. It has been suggested that the practical difficulties are greatest when the gear is set in the early morning (Melvin & Baker, 2006).

Dyeing the bait blue has been effective when tried on squid in experimental trials in Hawaii and Brazil. The concrete specifications of the dye used in successful tests are as follows: use 'Brilliant Blue' food dye (Colour Index 42090, also known as Food Additive number E133) mixed at 0.5% for a minimum of 20 minutes (Melvin & Baker, 2006). The same source recommends, however, that this method is used in combination with other mitigation measures, particularly bird-scaring lines or night-setting.

How it can reduce seabird by-catch in the Mediterranean region

Blue-dyed bait has been most successful with pelagic longlines in Hawaii and Brazil, which are both situated at relatively low latitude and where there is plenty of light. It is therefore possible that it might work equally well in pelagic fisheries in the Mediterranean, especially those that use squid as bait like the tuna & swordfish fisheries.

Using thawed bait in the Mediterranean poses no particular problems other than some availability of space. Its advantages extend to the blue-dyed bait, because the bait generally thaws during the process of dyeing, something that is usually done on board, in a bucket or some other recipient.

Recommendations

Using thawed bait should be the common rule in the Mediterranean, and this is recommended as a complementary measure in its pelagic fisheries. The same can be said about blue-dyed bait, which is recommended for testing in Mediterranean waters. Both need to be used with some additional (primary) mitigation measures, such as night-setting and bird-scaring lines.

The fact

From Cocking et al. (2008):

"The application of blue-dye to fishing baits is a seabird by-catch mitigation technique used in some pelagic longline fisheries that is thought to make the baits less visible and hence less attractive to seabirds. We tested this assumption in two ways. First, by measuring the spectral profiles of blue-dyed baits (fish and squid) and modelling the spectral profiles of the ocean under set conditions, we assessed how well wedge-tailed shearwaters (Puffinus pacificus) can distinguish dyed baits based on the known visual characteristics of this species. Results showed that no baits were perfectly cryptic against the background ocean, and only blue-dyed squid were relatively cryptic both in terms of chromatic and achromatic contrasts. Second, during at-sea trials blue-dyed and non-dyed baits that were simultaneously presented submerged on a longline or as surface presentations. During 26 longline sets which presented squid only, a 68% reduction in interactions with blue-dyed squid was observed compared to non-dyed squid. During surface presentations only 3–8% of blue-dyed squid baits were struck

over the duration of the study compared with 75–98% of non-dyed squid bait. When using fish baits, however, approximately 48% of all blue-dyed baits presented in the first two days of trials received strikes from seabirds but this increased to 90% over the last three days. These results suggest the use of blue-dyed squid bait could decrease seabird by-catch in pelagic longline fisheries whereas blue-dyed fish baits are less likely to have a mitigatory effect.
(...)
A successful by-catch mitigation technique needs to be effective regardless of environmental conditions, seabird abundance or composition, or the extent of exposure to the mitigation technique; these factors that are highly variable within areas where longline fishing occurs ([Brothers et al., 1999] and [Gilman et al., 2003]). Our results suggest that blue-dyed fish are unlikely to be effective as a long-term seabird by-catch mitigation technique because, in this study, the strike rate on blue-dyed fish baits increased over time. In contrast, over this three month study, blue-dyed squid baits caused a strong and consistent reduction in seabird interactions relative to non-dyed squid baits. However, it is not known whether blue-dyed squid will be equally effective in all conditions and remain effective with increased exposure, therefore its application within commercial longline fisheries would require monitoring.
(...)
No mitigation technique has been shown to completely eliminate seabird by-catch, but blue-dyed bait may increase the effectiveness of other proven seabird by-catch mitigation techniques such as bird scaring lines or weighted lines. The use of multiple approaches has been championed in CCAMLR fisheries which, through the mandatory use of bird scaring lines together with line weighting, achieved a 99% reduction in seabird by-catch (Small, 2005). Blue-dyed bait has yet to be comprehensively tested with other techniques but recently Minami and Kiyota (2006) showed that using blue-dyed bait together with bird scaring lines was more effective at reducing seabird by-catch in a pelagic longline fishery than employing either technique alone."

Line shooter (column B)

How it works

What is known as a line shooter is a device designed to reduce line tension of the longline at the moment of setting. It consists of a pair of hydraulically operated wheels that pull the line through an autoliner (*e.g.* as manufactured by Mustad™) at a speed that is slightly greater than vessel speed. The gear is thus delivered directly into the water, without tension, and is free to sink closer to the vessel and generally at a greater speed. The overall effect is to reduce the time that the hooks are close to the surface and within the reach of scavenging seabirds.

In trials carried out so far, the line shooter caused a reduction in seabird by-catch in some waters (*e.g.* of Northern fulmars in the North Sea, (Løkkeborg & Robertson, 2002)) but performed poorly in other situations (*e.g.* in Alaska, Melvin *et al.*, 2001). Experiments show that it may indeed increase sink rate but it does not eliminate the area behind the vessel where the birds are at greatest risk from being caught (Melvin & Baker, 2006), so the use of additional mitigation measures (*e.g.* night-setting and bird-scaring lines) is strongly encouraged.

How it can reduce seabird by-catch in the Mediterranean region

No trials are known on the use of line shooters in Mediterranean waters, so direct data are not available. It may be inferred that this method could work, as a complementary mitigation measure, in the pelagic longline fishery (where the use of

autoliners is more widespread and the vessel speed during setting is greater), but the results are uncertain. Any further experimentation must be done with caution.

Recommendations

A line shooter manufactured by Mustad™ is available for purchase in combination with its autoliner system. However, this cannot be used as the only mitigation measure on board, and should always be used in combination with other methods.

The fact

From Løkkeborg (2003):
"The line shooter is designed to set lines at a speed slightly faster than the vessel's speed through the water during setting. It was placed after the baiting machine, and ensured that the line was set slack (i.e. without tension) in the water in order to increase the speed of sinking.
(...)
In all experiments there were significant differences in the numbers of seabirds caught using the various setting methods. The by-catch of seabirds was reduced by all the mitigation measures tested, although the reduction was not statistically significant for the line shooter. Seabird catch rates (number of birds per 1000 hooks) ranged from 0.55 to 1.75 for the control lines and from 0 to 0.49 for the lines set when one of the measures was employed. The clearest reductions in seabird by-catches were found with the bird-scaring line. In the course of the three experiments, a total of 185 000 hooks were set using the bird-scaring line and only two birds were caught compared with 205 for the control lines with a similar number of hooks. The great majority of the birds caught were northern fulmars.
(...)
Seabird by-catch was reduced by 59% for lines set with the line shooter, but this difference was not statistically significant. This device does not seem to be as efficient as the bird-scaring line or the setting funnel in reducing seabird by-catch. Longlines set with the line shooter have been shown to reach 3 m depth 15% faster than lines set without it, indicating that lines set with slack may reduce the availability of baited hooks to seabirds (Løkkeborg and Robertson, 2002). However, the results showed that birds were still able to take baits. Using weighted lines simultaneously is one possible way of improving the efficiency of the line shooter, and it is likely that less weight would be needed when the lines are set slack."

Mitigation measures for trawler fisheries

Evidence of seabird collisions and entanglements leading to injuries and mortality in trawler fisheries only came after scientific observers started to survey the operations of trawlers in the 2000s (Ryan & Watkins, 2008; Sullivan *et al.*, 2006). The known causes of mortality recorded in trawl fisheries are varied and depend on the nature of the fishery (pelagic or demersal) and the species targeted; however, they may be categorised into two broad types: cable-related mortality, including collisions with netsonde cables, warp cables and paravanes; and net-related mortality, which includes all deaths caused by net entanglement(Sullivan, 2006).

No concrete data on this type of mortality exists from the Mediterranean, but it is reasonable to infer that it is most likely to occur, and hence apply the precautionary principle and act consequently. Trawling is very widespread in the Mediterranean and the discards generated by this fishing method are indeed the main source of food for those seabirds that depend on scavenging for feeding. Among the species that regularly attend trawlers and feed on their

offal, the most numerous ones include the three Mediterranean shearwaters (*Calonectris diomedea, Puffinus mauretanicus, Puffinus yelkouan*) and some of the endemic gulls, including those that are of some conservation concern (*Larus audouinii, Larus melanocephalus*)(Arcos & Oro, 2002; Dunn, 2007; Martinez-Abrain *et al.*, 2002; Mañosa *et al.*, 2004; Oro & Ruiz, 1997; Pedrocchi *et al.*, 2002). Equally, some other species also resort to scavenging from trawlers on an irregular basis or in some areas only. These include the Mediterranean Shag (*Phalacrocorax aristotelis desmarestii*), the Slender-billed Gull (*Larus genei*), the Sandwich Tern (*Sterna sandvicensis*) and the Razorbill (*Alca torda*). The group of Atlantic seabirds that obtain much of their food attending trawlers in the Mediterranean in winter include common species like the Northern Gannet (*Morus bassanus*), the Great Skua (*Chataracta skua*), the Lesser Black-backed Gull (*Larus fuscus*) and the Kittiwake (*Rissa tridactyla*). This list is completed with the common Mediterranean near-endemics Yellow-legged Gull (*Larus michahellis*) and Caspian Gull (*Larus cachinnans*). All of these species are at risk from interactions with trawling fishing vessels.

Objective data from scientific observers on board are urgently needed in order to quantify and situate (geographically and temporally) this kind of interaction with seabirds in Mediterranean fisheries. Sporadic observations (C. Carboneras, pers. obs.) have found, in various species of gull, injuries that point to trawl fisheries as a source of interaction with seabirds.

Offal and discard management

Its relevance as a mitigation measure in Mediterranean trawl fisheries

The strategic management of offal and fish discards is not exclusive to trawl fisheries as a mitigation measure but, in them, it can also effectively help reduce the number of birds present astern of the vessel and, therefore, diminish the risk of possible interactions. According to the group of experts consulted by FAO, this is the most likely long-term solution to reducing seabird incidental catch in trawl fisheries (FAO, 2008). Effective fish waste management combined with operational measures such as cleaning the net prior to shooting and reducing the time that the net is on the surface at shooting and hauling are the best practice measures available for reducing seabird net entanglements.

Area/seasonal closures

Its relevance as a mitigation measure in Mediterranean trawl fisheries

This mitigation measure intends to reduce the area of overlap between trawl fishing and the areas of maximum seabird density. By so doing, the risk of interaction would be reduced. However, in order to be effective, area/seasonal closures need to be established at the right scale (that is, far enough from the centres of seabird activity so that seabirds do not become attracted to the displaced fishing grounds), and this seems hardly practicable in the Mediterranean trawl fisheries of today.

Some Mediterranean countries, particularly those that belong to the European Union, have established regular temporal moratoria, during which they subsidise their fleet and crews to stop extractive fisheries for a few weeks and allow for the recovery of stocks. This is a fishery management measure that is renewed annually but, unfortunately, the exact timing is established without taking into account its impact on the rest of the ecosystem. The consequences on the seabirds that have started to breed, or about to do so, may be disastrous (Arcos, 2001; Oro *et al.*, 2004).

A more desirable functioning of this measure should aim to integrate seabird conservation needs in the design of its regime. Seasonal/area closures can be a powerful seabird conservation tool if managed correctly (Bull, 2007a; Louzao *et al.*, 2006).

Bird-scaring line

Its relevance as a mitigation measure in Mediterranean trawl fisheries

With a design similar to the bird-scaring (or streamer or *tori*) lines in use for longline fisheries, a single or double line is recommended to keep birds away from the dangerous area astern of trawler vessels. The principle of operation is the same as described for longlining, although in practice it requires some modification of habits and more caution on the side of the skipper, because there are more cables and more objects being towed and therefore there is an increased risk of entanglement. To deter birds from collision with the warp cables, paired streamer lines should be suspended on each side of the warps (Løkkeborg, 2008).

As with longlining, bird-scaring lines do effectively reduce the number of seabirds that enter the „danger zone' astern of the vessel. Their use in trawl fisheries in the Mediterranean is highly commended as a management measure for those areas/seasons known to be of high conservation value for seabirds, *e.g.* in Special Protection Areas (SPAs) forming part of the Natura 2000 network according to the European Commission Birds Directive 79/409/EEC.

Warp scarer

Its relevance as a mitigation measure in Mediterranean trawl fisheries

A warp scarer consists of a series rings joined by a length of netting forming a hose around the aerial part of the warp. Streamers hang from each ring and scare birds, making warps visible and deterring them from colliding with the cable. Several designs have been developed and trialled for their effectiveness in reducing contacts and mortalities associated with the warp cable; they have shown good results in the Falkland Islands/Islas Malvinas demersal trawl fishery and in the squid trawl fishery in New Zealand, although in their current development and in rough seas, there are some instances when they may leave the warp unprotected and thus susceptible to collision by seabirds (Bull, 2007b).

Net-binding and net-weighting

Its relevance as a mitigation measure in Mediterranean trawl fisheries

Net-binding and net-weighting have been proposed as two appropriate mitigation measures for trawl fisheries in the Southern Ocean (Hooper *et al.*, 2003; Sullivan *et al.*, 2004). The former consists in tying some sort of binding (*e.g.* plastic strings) to nets in order to keep them closed as they are set. The net enters the water as a compact mass, instead of a floating mesh, and sinks more quickly; the bindings break as the moving vessel increases the tension, but by then the net is out of reach of prospecting seabirds. In experimental trials, net-binding successfully avoided the catching of birds off the Falklands/Malvinas in comparison with control tests (8 birds).

By adding extra weight to the trawling gear (net-weighting), the sinking rate is increased, and so the time that the net remains less time close to the water surface. This has been trialled in one fishery only (Hooper *et al.*, 2003), and the non-conclusive results have been attributed to nets with several different designs being mixed in the tests.

The main conclusion is that net design, and the management of the setting and hauling operations (*e.g.* by cleaning the net and therefore reducing the amount of offal available to seabirds), can effectively contribute to reducing seabird by-catch in trawl fisheries as well as in longlining(FAO, 2008). The Mediterranean can be a good example case, and further testing of these, and possibly some other measures developed by fishers or researchers, should be encouraged.

Mitigation measures for gillnets/trammel nets & pot/trap fisheries

The impact of gillnets on some seabird species is well known from many parts of the world, including the Mediterranean, where the problem was detected initially in the 1970s (Carboneras, 1988; Guyot, 1990; Mead, 1974). Seabirds and fishing gear often co-occur in some favourable areas, and the birds may entangle and drown when diving in pursuit of fish. It is suspected that birds may sometimes be attracted to gillnets (and trammel nets) and the opportunity they offer to „steal' some fish. But the result is that some mortality occurs in nearly all cases. The species mainly affected are those that feed by diving, which in the region include the threatened endemic Mediterranean Shag *Phalacrocorax aristotelis desmarestii* (Culioli, 2006)and the scarce Razorbill *Alca torda*, a winter visitor. Recoveries of ringed birds reveal that mortality from interactions with fisheries is very high (>50 % of the Shags found dead in some countries) and this presumably has a huge impact on the species' demography.

However, despite the problem being known for a long time, little effort has been devoted to research into designing ways to avoid this negative interaction. The North Pacific, where alcids such as the Common Guillemot *Uria aalge* and other close relatives of the Razorbill abound) is the only region where some relevant research has been undertaken. The following mitigation measures have been forward as proposals:

Visual alerts

It has been proposed to add visual markers to gillnets (*e.g.* by dyeing the nets with an opaque colour or by adding highly visible netting in the upper net) to increase their visibility underwater and make them more conspicuous to approaching seabirds (Melvin *et al.*, 1999). The eyesight of these is sensibly more acute than that of fish, but in the published experiments it was not possible to find the best adjustment, and in some cases it was proven that there was also a significant reduction in fish catches that was associated with the important reductions in seabird by-catch. However, this is an area that is open to much experimentation by fishers and researchers. Knowing the different sensorial capabilities of seabirds and fish, it should be possible to find a visual/magnetic/chemical deterrent that acts successfully by keeping seabirds away from the standing net but which does not interfere with the activities of the approaching (target) fish.

Acoustic alerts (pingers)

Acoustic pingers, clipped to the nets, emit a sound signal that falls within the hearing frequency of seabirds (whilst that of fish is very limited or non-existent) and act as a deterrent with no obvious reduction in the amount of fish being caught. Successful tests were carried out by Melvin *et al.* (1999) in the North Pacific using pingers initially designed to avoid by-catch of cetaceans. Acoustic alerts, however, have not been adopted by this or any other gillnet fishery, so few concrete data are available for other areas or combinations of species. Again, this is an area most suitable for further research and experimentation, possibly with the aid of public funds.

Pots and traps, as those used to capture molluscs and arthropods in the Mediterranean, as well as some fixed nets set for small tuna, are also known to cause some mortality of diving seabirds, *e.g.* of Mediterranean Shags (C. Carboneras, pers. obs.). Unfortunately, no specific mitigation measures have been developed or tested to avoid or reduce the by-catch rates in these fisheries, so one can only conjecture on the possible ways to combat this by-catch and on their hypothetical success. In order to move from this situation, fishers and researchers should be encouraged to try to understand how the interaction occurs and to design and test mitigation measures that can successfully prevent it.

PART THREE – IDENTIFYING & MANAGING A SEABIRD BY-CATCH PROBLEM

Defining a by-catch problem

The FAO *International Plan of Action for reducing the incidental catch of seabirds in longline fisheries* (FAO, 1999), or IPOA-Seabirds, does not define what constitutes a seabird by-catch „problem', generically, but it recommends that each State undertakes an assessment of its fisheries based on a list of components that include data on fishing effort, status of seabird populations, total annual catch of seabirds and mitigation measures in use. More recently, the experts consulted by FAO remark that reports of sporadic captures from fishermen or observers outside of formal observer programmes addressing seabird incidental mortality may be the first sign of a more generalized problem (FAO, 2008).

Experience has revealed that management authorities, in various countries, have gone through a slow progression, from denial through data collection to practical action (Croxall, 2008), and that this has taken at least a decade in the best of cases. However, as knowledge of fisheries and our understanding of how the interactions occur has tended to improve, the process may be compressed into only a few years.

Vital to the process is that each State assesses its fisheries and announces whether it has a seabird by-catch problem. If it does, it should start to take action immediately, namely by implementing the range of mitigation measures that is deemed most appropriate, coupled with sufficient monitoring by scientific observers. If, on the contrary, it does not have a seabird by-catch problem, the rest of the world would also be interested to know. Perhaps there is something in the techniques or methodologies they use that is relevant and effectively avoids the interaction from happening.

The essential role of scientific observers

The use of well trained observers is the most reliable means of monitoring fisheries performance with respect to seabird by-catch and use of mitigation measures (FAO, 2008). To this end, States are encouraged to establish on-board observer programmes that provide independent and representative data to be used later to confirm, revise or modify the adequacy of the fishery management regulations.

Observers should receive sufficient training on seabird identification, technically quite complex, and on the specific aspects of observation on different types of vessel and on the registration of data. It is important that data are comparable and, hence, are collected according to international standards. These can be provided by the scientific or technical committees of Regional Fisheries Management Organizations (RFMOs), such as ICCAT[1] and the GFCM[2], to which Member States are already committed to report.

Observer programmes require considerable technical and financial resources to be successful (FAO, 2008). In countries with well-developed commercial fisheries, the costs are often shared by the management agencies and the industry, who are also responsible for providing space to accommodate observers on the vessel. Collaboration between agencies, and between States, can help to build capacity in those countries that are less prepared to implement comprehensive observer programmes but whose fisheries overlap with significant populations of seabirds that are equally worth of conservation measures.

Improving current mitigation tools through innovation and research

Innovation and research into the design of better and more efficient mitigation measures was an essential element of the FAO IPOA-Seabirds (FAO, 1999), originally prepared in 1997-98 and adopted in 1999. Unfortunately, one decade later, this is still true and the expert consultation convened by FAO (FAO, 2008) continues to recommend not only that research and innovation are maintained but also that mitigation measures are used in combination to maximise their effectiveness. The message, therefore, is that the „silver bullet' or "magical solution that will solve the problem once and for all" has not been found yet. So, research must continue. And, in the meantime, a recipe of at least two mitigation measures used in combination at sea is recommended as the best practice.

Recent years have seen the opening and development of new lines of research into mitigation of seabird by-catch, ranging from olfactory deterrents (Pierre & Norden, 2006) to artificial lure, and including various types of curtains, bafflers and underwater-setting devices (Bull, 2007a). Several competitions of ideas have been run, and continue to run, with the aim of finding the best practical solution. Many scientists, all over the world, work to develop ways, carry out trials and experiment with tools, mechanisms and techniques.

Innovation and research require a great deal of involvement of the fishing industry, scientists and resource managers. This cannot be done without the collaboration and dialogue that have led to a lot of testing in the past, and without observation and sharing of experiences. Unfortunately, the Mediterranean region –where most modern fishing methods were

[1] International Commission for the Conservation of Atlantic Tunas, http://www.iccat.int
[2] General Fisheries Commission for the Mediterranean, http://www.gfcm.org

originally developed– is lagging behind in this process. The future of fishing relies on its sustainability, and this should be seen in the Mediterranean mainly as an opportunity.

What seabird breeding numbers can tell us about the situation at sea

Seabirds live at sea, but must come to land in order to breed. There, they concentrate in colonies and are relatively easy to count and monitor. The evolution through time of seabird populations is the measure of our success. Their numbers need to be monitored regularly, and essential data on their demography (survival of adult birds, breeding productivity, recruitment of new breeders) needs to be gathered and analysed on a yearly basis. Seabirds live for very long (in the Mediterranean, the average lifespan of many species is >20 years) and the demographic effects on the population are not revealed immediately. Therefore, only the long-term monitoring of seabird numbers and their demography will tell what is happening at sea.

A key element of seabird demography is the survival of adult birds of breeding condition. And it is this, precisely, that is being threatened by interactions with fisheries. Breeding birds are more concentrated and need to gather more food (for their offspring as well as for themselves), so they have a higher risk of mortality in certain areas and at certain times of the year. By following them up closely (*e.g.* through mark-recapture methods) it is possible to have a precise idea of how well they survive and, so, how they contribute to the stability of their population.

Exercising responsibility in the international context: conventions & RFMOs

States have a shared responsibility to conserve biodiversity, particularly in the marine environment, where there are no borders, and even more particularly in the Mediterranean, an enclosed sea bordered by many Nations and subject to many pressures. One way to exercise responsibility in the international context is by signing conventions and treaties, and by taking part in their implementation. Foremost is the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, and its Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD). Both serve the purpose of protecting and preserving the seabird fauna and of providing the means for international cooperation in the conservation and sustainable use of biological diversity in the region. The Regional Activity Centre for Specially Protected Areas (UNEP-MAP-RAC/SPA) was commissioned by the Parties to the Barcelona Convention to implement the SPA/BD Protocol.

The Action Plan for the conservation of bird species listed in Annex II of the SPA/BD Protocol, adopted in 2003 (UNEP - MAP - RAC/SPA, 2003), identifies by-catch as an important threat for a number of species (*Calonectris diomedea*, *Puffinus mauretanicus*, *P. yelkouan*, *Phalacrocorax aristotelis* and *Larus audouinii*) and calls for the development of a specific Action Plan to reduce it. The 1st Symposium on the Mediterranean Action Plan for the conservation of marine and coastal birds (UNEP - MAP - RAC/SPA, 2006) continued to identify by-catch as a major threat for these species.

Additionally, the African-Eurasian Waterbird Agreement, signed by nearly all States bordering the Mediterranean among others, provides for the conservation of 255 species of

birds ecologically dependent on wetlands for parts of their life cycle. Its article 4.3.7 reads*: "Parties are urged to take appropriate actions nationally or through the framework of Regional Fisheries Management Organisations (RFMOs) and relevant international organisations to minimise the impact of fisheries on migratory waterbirds, and where possible cooperate within these forums, in order to decrease the mortality in areas within and beyond national jurisdiction; appropriate measures shall especially address incidental killing and by-catch in fishing gear including the use of gill nets, longlines and trawling."*

Shearwaters are the most threatened seabird species in the Mediterranean region. The Agreement on the Conservation of Albatrosses and Petrels (ACAP), which came into force in 2004, provides a new and specific conservation tool in the international context. It was originally designed to protect the threatened species of albatrosses and petrels inhabiting the southern Hemisphere, but was later opened to provide for the conservation of a list of Procellariiform species that currently covers 19 albatrosses and 7 petrels but may soon extend to North Pacific albatrosses and possibly other species. It has been proposed that the three Mediterranean shearwaters (*Calonectris diomedea*, *Puffinus mauretanicus* and *P. Yelkouan*) be listed as well (J. Cooper & Baker, 2008). This would bring ACAP much closer to the Mediterranean, as France and Spain are member States of ACAP and, at the same, have breeding populations of those species. ACAP urges its Parties to *"take appropriate operational, management and other measures to reduce or eliminate the mortality of albatrosses and petrels resulting incidentally from fishing activities. Where possible, the measures applied should follow best current practice"* (Agreement on the Conservation of Albatrosses and Petrels, 2008).
In parallel, two RFMOs are responsible for managing fisheries in the area and to do so in accordance to the FAO Code of Conduct for Responsible Fisheries: the General Fisheries Commission for the Mediterranean (GFCM) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). The latter adopted its first Resolution on seabird by-catch in 2002. This has now been superseded by Recommendation 07-07 on seabird by-catch, reporting requirements and mitigation measures. The full text of this important Recommendation, applicable to tuna and swordfish fisheries in Mediterranean waters, is reproduced in Appendix III.

The GFCM Scientific Advisory Committee, through its Subcommittee on Marine Environment and Ecosystems (SCMEE), has remarked the need to maintain close collaboration with partner organisations on issues such as discards and by-catch of species of conservation concern (FAO, 2009). It collaborates with RAC/SPA on by-catch reduction issues along the last years, developing also a draft common protocol for data collection on by-catch; It set as well a workshop on by-catch reduction (September 2009).

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APPENDIX I – RESCUE INSTRUCTIONS: HOW TO HELP A HOOKED SEABIRD

1. Very few seabirds can survive with a hook and a line. So **NEVER cut the line** and release an injured bird. At least hold the bird and examine it.

2. Gently, **RETRIEVE THE BIRD ONBOARD** and get control over the animal. **Do not pull it**, if possible, as this can cause more harm.

3. **Beware of the beak.** Just try to hold it between your thumb and finger. If it is a big bird, then grab it and hold the top beak or both and calmly control it. Be careful and don't cover its nose or it could die of suffocation.

4. It can be useful to place a towel or shirt over the bird's head and eyes. Watch your eyes and use work gloves!

5. Ask somebody to help you, so one can hold the animal while the other tries to remove the hook or line.

6. If the **HOOK is VISIBLE** you can try to remove it carefully. The best practice is to cut one end of the hook with pliers or a cutter and then take out the two parts separately.

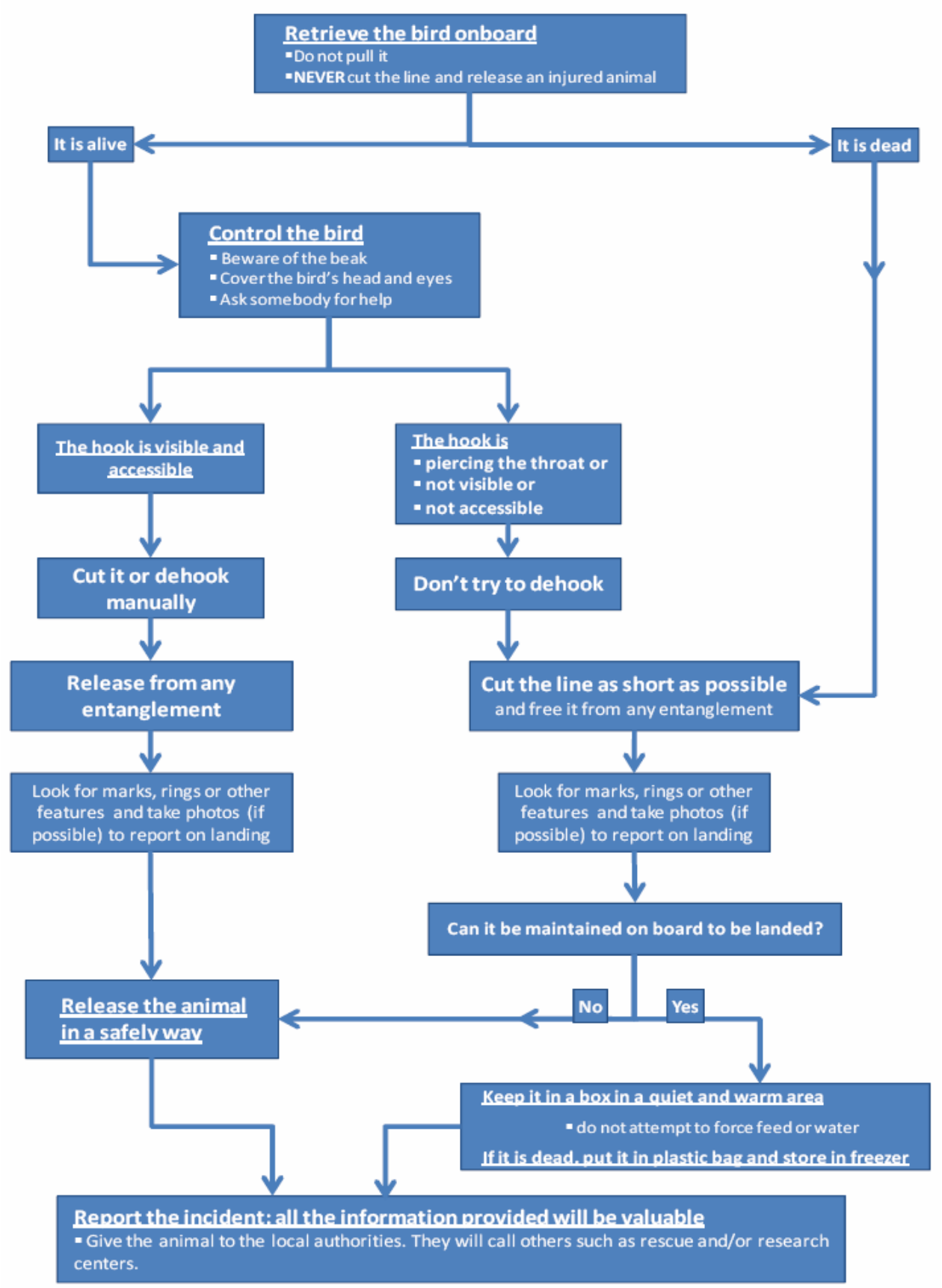
7. Once the hook is released and there is no line entangling the animal, you can release it gently overboard. Make sure there is no fishing gear in the water and the vessel is in neutral while you free the bird.

8. If the **HOOK pierces the throat** or if the bird has swallowed it **DON'T TRY** to remove it.

9. In that case, **CUT THE LINE AS SHORT** as you can and put the bird inside a box, in a warm, dark and a quiet environment and leave it there. Put water out for it and let it drink, but do not attempt to force feed it or make it drink.

10. Once you are back on land, **call the local authorities** and ask them to collect the bird. Give them the animal alive or dead, as it can provide valuable information (on the species, its origin and age) to researchers in any case. Also try to take a photograph and report any details such as marks, rings, numbers or any other remarkable feature.

11. If you can't keep the animal onboard (even if it dies), you may decide to release the injured bird after cutting the line and freeing it from any entanglement. Remember that too long a line can also threaten the lives of other animals.


Retrieve the bird onboard
Do not pull it
NEVER cut the line and release an injured animal
It is alive
It is dead
Control the bird
Beware of the beak
Cover the bird's head and eyes
Ask somebody for help
The hook is visible and accessible
The hook is
piercing the throat or
not visible or
not accessible
Cut it or dehook manually
Don't try to dehook
Release from any entanglement
Cut the line as short as possible
and free it from any entanglement
Look for marks, rings or other features and take photos (if possible) to report on landing
Look for marks, rings or other features and take photos (if possible) to report on landing
Can it be maintained on board to be landed?
No
Yes
Release the animal in a safely way
Keep it in a box in a quiet and warm area
do not attempt to force feed or water
If it is dead, put it in plastic bag and store in freezer
Report the incident: all the information provided will be valuable
Give the animal to the local authorities. They will call others such as rescue and/or research centers.

APPENDIX II - INTERNATIONAL PROTECTION STATUS FOR MEDITERRANEAN SEABIRDS POTENTIALLY SUBJECT TO INTERACTION WITH FISHERIES AND THEIR OCCURRENCE IN COASTAL STATES & RISK ASSESSMENT FOR SEABIRD-FISHERY INTERACTIONS IN THE MEDITERRANEAN

Table I – International protection status for Mediterranean seabirds potentially subject to interaction with fisheries and their occurrence in coastal States as breeders (◆) and non-breeders (◇).

Species	IUCN	BirdLife (Europe)	Barcelona Convention	AEWA	EC Birds Directive	Albania	Algeria	Bosnia and Herzegovina	Croatia	Cyprus	Egypt	France	Greece	Israel	Italy	Lebanon	Libya	Malta	Monaco	Montenegro	Morocco	Slovenia	Spain	Syria	Tunisia	Turkey
MAP species																										
Calonectris diomedea	LC	(VU)	●		●	◆	◆◇		◆	◇		◆◇	◆◇	◇	◆◇	◇	◇	◆◇	◇	◇	◇		◆◇		◆◇	◆◇
Puffinus mauretanicus	CR	CR	●		●		◇					◇			?						◇		◆		◇	
Puffinus yelkouan	NT	S	●		●	◆	◆◇		◆◇			◆◇	◆◇	◇	◆◇	◇	◇	◆◇	◇	◇	◇	◇	◆◇		◇	◆◇
Hydrobates pelagicus	LC	(S)	●		●		◆◇					◆◇	◆◇		◆◇			◆◇			◆◇		◆◇		◇	◇
Phalacrocorax aristotelis (desmarestii)	LC	(S)	●		●	◆	◆		◆	◆		◆	◆		◆	◇	◇			◇	◇	◇	◆	◇	◇	◆
Larus audouinii	NT	L	●	●	●	◇	◆◇		◆	◆◇	◇	◆◇	◆◇		◆◇	◆	◇	◇			◆◇		◆◇	◇	◆◇	◆◇
Non MAP																										
Morus bassanus	LC	S		●			◇				◇	◇			◇			◇	◇		◇		◇		◇	
Phalacrocorax carbo	LC	S		●		◆◇		◆◇	◆◇	◇	◇	◆◇	◆◇	◇	◆◇			◇		◆◇		◇	◆◇		◇	◆◇
Catharacta skua	LC	S		●			◇					◇			◇			◇	◇		◇		◇		◇	
Larus melanocephalus	LC	S		●	●	◆◇	◇	◆	◆		◇	◆◇	◆◇	◇	◆◇	◇	◇	◇		◆	◇	◇	◇		◇	◆◇
Larus ridibundus	LC	(S)		●		◇		◆◇	◆◇	◇	◇	◆◇	◆◇	◇	◆◇	◇		◇		◆◇		◆◇	◆◇	◇		◆◇
Larus fuscus	LC	S		●		◇	◇	◇	◇	◇	◇	◇	◇	◇	◇		◇	◇		◇	◇	◇	◆◇	◇	◇	◇
Larus michahellis	LC	S		●		◆◇	◆◇	◆	◆◇	◆◇	◇	◆◇	◆◇	◇	◆◇	◆◇		◆◇		◆◇	◆	◆◇	◆◇	◆◇	◆◇	◆◇
Alca torda	LC	(S)		●			◇					◇			◇			◇	◇		◇		◇		◇	
Fratercula arctica	LC	(H)		●			◇					◇			◇			◇	◇		◇		◇		◇	

IUCN categories from *IUCN Red List of Threatened Species. IUCN (2008)*: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern
BirdLife (Europe) categories from *Birds in Europe: population estimates, trends and conservation status*. BirdLife International (2004): CR – Critically Endangered; VU – Vulnerable; H – Depleted; L – Localised; S – Secure
Barcelona Convention. Seabird species listed in the *Protocol concerning specially protected areas and biological diversity in the Mediterranean.* Annex II: List of Endangered or Threatened Species.
AEWA. Seabird species listed in the *Agreement on the Conservation of African-Eurasian Migratory Waterbirds.* Annex 2: Waterbird species to which the Agreement applies.
EC Birds Directive. Seabird species listed in the *Council Directive 79/409/EEC on the conservation of wild birds.* Annex I. Species subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution.

Table II –Risk assessment for seabird-fishery interactions in the Mediterranean. The table shows attractiveness and risk of capture of selected seabird species in different fisheries and types of gear commonly used in the Mediterranean region. Blue dots indicate very strong (●●), strong (●) or light (○) attraction of seabirds to operating vessels or set gear. Known or predicted risk of capture has been evaluated into five categories (very high, high, moderate, low or unknown), according to the birds' feeding habits and the characteristics of the fishing method. Fishing methods from Coppola (2003).

Species	**Longlining** (demersal)	**Longlining** (pelagic)	**Trawling**	**Gillnet / trammel net**	**Purse-seining**	**FAD** (fishing attractive device) dolphinfish	**Driftnets**	**Trolling** (line, lure)	**Recreational** (boat)	**Recreational** (shore)	**Pot** (artisanal)	**Trap** (artisanal)	**Fish farms**
Calonectris diomedea	●● very high	●● very high	● high	○ unknown	○ unknown	○ unknown	○ high	○ moderate					
Puffinus mauretanicus	●● very high	● high	● high	● high	○ unknown	○ unknown			○ moderate				
Puffinus yelkouan	●● very high	● high	● high	● high	○ unknown	○ unknown	○ high		○ moderate				
Hydrobates pelagicus					○ unknown	○ unknown	○ high						
Phalacrocorax aristotelis	○ low		○ low	● high					○ moderate	○ moderate	○ moderate	○ moderate	○ moderate
Phalacrocorax carbo	○ low		○ low							○ low		○ low	● high
Morus bassanus	● moderate	● moderate	● high	○ unknown				○ moderate					
Catharacta skua	● moderate	○ low	● low										
Larus audouinii	● high	● high	● high	○ unknown	● unknown	○ unknown	○ high	○ moderate		○ moderate			○ low
Larus melanocephalus	○ low	○ unknown	● high		○ unknown								
Larus ridibundus	○ low		● low										
Larus fuscus	○ low		● moderate										
Larus michahellis	● moderate	● moderate	● moderate	○ unknown	○ unknown			○ moderate	○ moderate	○ moderate			○ moderate
Alca torda	○ low		● low	● high	○ unknown				○ moderate				
Fratercula arctica				○ unknown			○ unknown						

APPENDIX III – RECOMMENDATION [07-07] BY ICCAT ON REDUCING INCIDENTAL BY-CATCH OF SEABIRDS IN LONGLINE FISHERIES

RECOGNISING the need to strengthen mechanisms to protect seabirds in the Atlantic Ocean;
TAKING INTO ACCOUNT the United Nations Food and Agriculture Organisation (FAO) International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds), and the IOTC Working Party on By-catch objectives;
ACKNOWLEDGING that to date some Contracting Parties and Cooperating non-Contracting Parties, Entities, or Fishing Entities (hereinafter referred to as "CPCs") have identified the need for, and have either completed or are near finalised, their National Plan of Action on Seabirds;
RECOGNISING the concern that some species of seabirds, notably albatross and petrels, are threatened with extinction;
NOTING that the Agreement on the Conservation of Albatrosses and Petrels, has entered into force;
RECALLING the *Resolution by ICCAT on Incidental Mortality of Seabirds [Res. 02-14]*;
CONSCIOUS that there are on-going scientific studies which may result in the identification of more effective mitigation measures and therefore that these current measures should be considered provisional;
THE INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS (ICCAT) RECOMMENDS THAT:

1. The Commission shall develop mechanisms to enable CPCs to record data on seabird interactions, including regular reporting to the Commission, and seek agreement to implement such mechanisms as soon as possible thereafter.

2. CPCs shall collect and provide all available information to the Secretariat on interactions with seabirds, including incidental catches by their fishing vessels.

3. CPCs shall seek to achieve reductions in levels of seabird by-catch across all fishing areas, seasons and fisheries, through the use of effective mitigation measures.

4. All vessels fishing south of 20°S shall carry and use bird-scaring lines (tori poles):

   - Tori poles shall be used in consideration of the suggested tori pole design and deployment guidelines (provided for in Annex A);

   - Tori lines are to be deployed prior to longlines entering the water at all times south of 20°S;

   - Where practical, vessels are encouraged to use a second tori pole and bird-scaring line at times of high bird abundance or activity;

   - Back-up tori lines shall be carried by all vessels and be ready for immediate use.

5. Longline vessels targeting swordfish using monofilament longline gear may be exempted from the requirements of paragraph 4 of this Recommendation, on condition that these vessels set their longlines during the night, with night being defined as the period between nautical dusk/dawn as referenced in the nautical dusk/dawn almanac for the geographical position fished. In addition, these vessels are required to use a minimum swivel weight of 60g placed not more than 3m from the hook to achieve optimum sink rates. CPCs applying this derogation shall inform the SCRS of their scientific findings resulting from their observer coverage of these vessels.

6. The Commission shall, upon receipt of information from the SCRS, consider, and if necessary, refine, the area of application of the mitigation measures specified in paragraph 4.

7. This measure is a provisional measure which will be subject to review and adjustment in the light of future available scientific advice.

8. The Commission shall consider adopting additional measures for the mitigation of any incidental catch of seabirds at its annual meeting in 2008 based on the results of the ICCAT seabird assessment which is currently underway.

Annex A

Suggested Guidelines for Design and Deployment of Tori Lines

Preamble

These guidelines are designed to assist in preparation and implementation of tori line regulations for longline vessels. While these guidelines are relatively explicit, improvement in tori line effectiveness through experimentation is encouraged. The guidelines take into account environmental and operational variables such as weather conditions, setting speed and ship size, all of which influence tori line performance and design in protecting baits from birds. Tori line design and use may change to take account of these variables provided that line performance is not compromised. On-going improvement in tori line design is envisaged and consequently review of these guidelines should be undertaken in the future.

Tori line design

1. It is recommended that a tori line 150 m in length be used. The diameter of the section of the line in the water may be greater than that of the line above water. This increases drag and hence reduces the need for greater line length and takes account of setting speeds and length of time taken for baits to sink. The section above water should be a strong fine line (e.g. about 3 mm diameter) of a conspicuous colour such as red or orange.

2. The above water section of the line should be sufficiently light that its movement is unpredictable to avoid habituation by birds and sufficiently heavy to avoid deflection of the line by wind.

3. The line is best attached to the vessel with a robust barrel swivel to reduce tangling of the line.

4. The streamers should be made of material that is conspicuous and produces an unpredictable lively action (e.g. strong fine line sheathed in red polyurethane tubing) suspended from a robust three-way swivel (that again reduces tangles) attached to the tori line, and should hang just clear of the water.

5. There should be a maximum of 5-7 m between each streamer. Ideally each streamer should be paired.

6. Each streamer pair should be detachable by means of a clip so that line stowage is more efficient.

7. The number of streamers should be adjusted for the setting speed of the vessel, with more streamers necessary at slower setting speeds. Three pairs are appropriate for a setting speed of 10 knots.

Deployment of tori lines

1. The line should be suspended from a pole affixed to the vessel. The tori pole should be set as high as possible so that the line protects bait a good distance astern of the vessel

and will not tangle with fishing gear. Greater pole height provides greater bait protection. For example, a height of around 6 m above the water line can give about 100 m of bait protection.

2. The tori line should be set so that streamers pass over baited hooks in the water.

3. Deployment of multiple tori lines is encouraged to provide even greater protection of baits from birds.

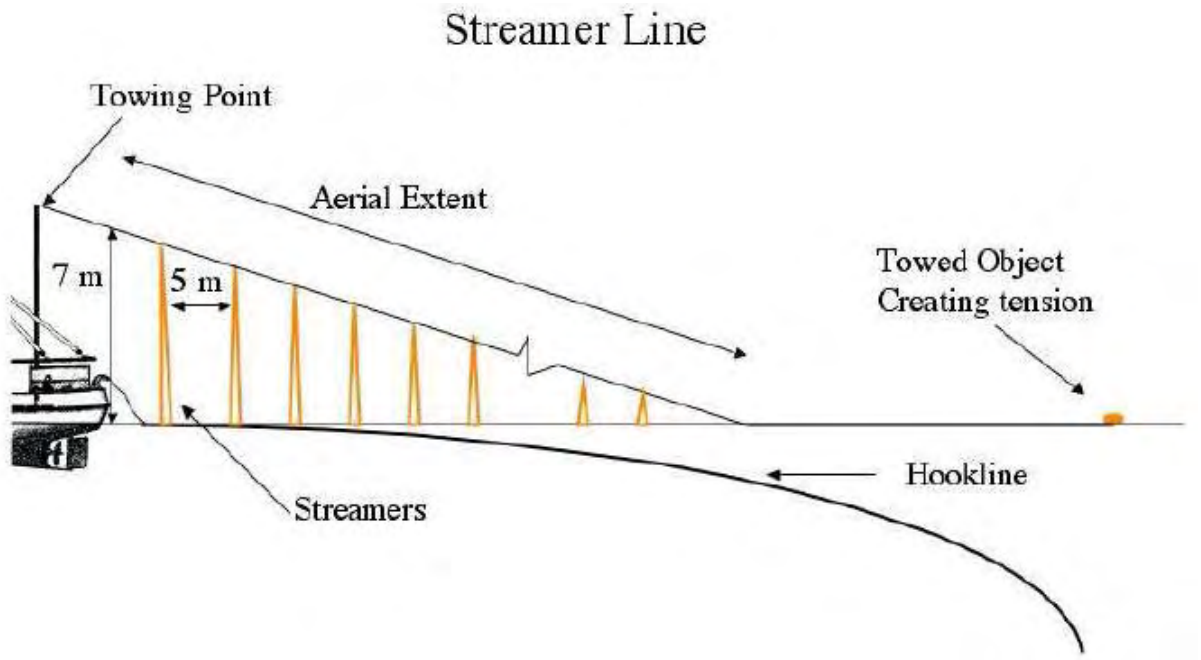
4. Because there is the potential for line breakage and tangling, spare tori lines should be carried onboard to replace damaged lines and to ensure fishing operations can continue uninterrupted.

5. When fishers use a bait casting machine (BCM), they must ensure coordination of tori line and machine by:

    (i) ensuring the BCM throws directly under the tori line protection, and
    (ii) when using a BCM that allows throwing to port and starboard, ensure that two tori lines are used.

6. Fishers are encouraged to install manual, electric or hydraulic winches to improve ease of deployment and retrieval of tori lines.

APPENDIX IV – BIRD-SCARING LINE DESIGN FOLLOWING CCAMLR CONSERVATION MEASURE 25/02



Annexe XIII - Draft Work and Budget Programme for 2010 – 2011

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Note from the Secretariat

In conformity with its mandate and the Protocol on Specially Protected Areas and Biological Diversity, RAC/SPA plays a vital role as far as the marine environment is concerned within the MAP system, insofar as there is no other international agreement so clearly dedicated to the life and marine resources in general. The Centre's medium and long term missions are clearly defined by the SPA/BD Protocol and target the conservation of threatened species and sensitive species. RAC/SPA's actions thus stem from its missions, namely:

- its mission as the Protocol Secretariat together with the MAP Coordination Unit
- its mission as the Information Centre on biodiversity
- its technical assistance mission for the neighboring countries for the implementation of the Protocol and the recommendations of the Contracting Parties, as established within the framework of the Strategic Action Programme for the conservation of biological diversity in the Mediterranean (SAP BIO) and the Mediterranean Strategy for Sustainable Development (MSSD).

The budget-programme aims only to cover the Centre's priority missions and its participation in the cross-cutting theme of climate change. In addition to the activities to be financed by the MTF (see table below) it should be pointed out that additional activities, financed totally or partly by various sources, are already underway and will continue in the course of the biennium, namely:

- The biodiversity aspect of the "Large Marine Ecosystems Partnership" Programme financed by the EC, AECID and FFEM (programme to be initiated in 2009 and to be completed in 2014 – 15).

- The programme on the identification of possible sites for setting up SPAMIs beyond the national territorial waters, financed by EC (programme initiated in 2008 and to be completed in 2011).

Other activities in line with the Centre's general objectives and mandate are being elaborated and could be initiated during the 2010 – 2011 biennium. They are not included in this document as they will receive specific funding.

The activities envisaged in the budget-programme are part of the stages identified in the SAP BIO and adopted for the previous biennium:

1. Inventory, mapping and surveillance of marine and coastal biodiversity in the Mediterranean
2. Conservation of habitats, sensitive species and sites
3. Evaluation and reduction of the impact of threats to biodiversity
4. Development of research to improve knowledge and fill in the gaps on biodiversity
5. Capacity building to improve coordination and technical assistance

At MAP's request, this budget is based on that of 2008-2009 as no increase had been requested at the last meeting of the Contracting Parties as far as the MTF budget is concerned. As costs have increased this means that the Centre's investment in terms of its priority missions, will be reduced.

As for activities initiated during the biennium such as the scientific watch and visibility of actions of MAP and its Centres, RAC/SPA should be enabled to properly assume its scientific watch mission and be the Mediterranean Exchange Centre on marine and coastal biodiversity (one person to be allocated to update the information, maintain the web site and MedGIS).

The meeting of the National Focal Points is invited to examine, discuss and agree on the Centre's activity programme for the next biennium so that it can be submitted to the meeting of MAP's Focal Points and to the 16th ordinary meeting of the Contracting parties for approval.

I. General objective of the work Programme for the conservation of Marine and Coastal Biodiversity

I.1. Five-year vision

As reliable data on species and natural sites are the basis of development and implementation of conservation programmes, the SPA/BD and the MAP Phase ll stressed the necessity of making inventories of the constitutive elements of Mediterranean marine and coastal biodiversity. Even though great efforts have been deployed there are still knowledge gaps and in the next five years to come, priority should be given to making inventories and/or increasing the store of knowledge.

Actions for the conservation of habitats, species and sensitive sites constitute the very backbone of the SPA/BD protocol and capacity building in the countries as this is one of the ways to ensure sustainability and actions like these can only be envisaged in the medium or long term. These actions are part of the biennium work programme and should be maintained so that during the next five years an ecosystem approach can be adopted and evaluation measures should be set up to test the efficacy of the training .

A more detailed evaluation of the impact of threats on biodiversity and means to reduce them are one of the major challenges in the medium term. Such actions have already been programmed for this biennium (work group on the sustainability of biodiversity, joint activities to reduce the impact on threatened species and sensitive sites), and should be further strengthened in line with the recommendations of the Almeria declaration and extended to other types of threat.

It is clear that with reference to the themes dealt with by RAC/SPA, the Centre's future actions should take into account the decisions stemming directly from our field of competence and which will be adopted within the framework of international conventions (Convention on Biological Diversity, Convention on Climate Change in particular).

The present budgets available are inadequate for the implementation of action plans adopted by the Contracting Parties (Monk Seal Action Plan or the Coralligenous Action Plan for example) and for fulfilling adequately the mission as an Information Centre on biodiversity and scientific watch (specific staff). Thus additional funding needs to be mobilized and partnership with the organisms concerned strengthened.

I.2. Biennium Objectives

For the 2010-2011 biennium the objectives are as follows:

I.2.1. Objective 1. Completion of the inventories on the distribution of key-habitats in the Mediterranean and to develop monitoring systems of marine and coastal biodiversity.

The Centre wishes to continue with its inventory work initiated during the 2008-2009 biennium, to complete and update them with the support of the Parties and scientists concerned. It also wishes to define and to set up surveillance systems which would make it possible to detect as quickly as possible any disturbance in the priority marine ecosystems so as to envisage measures to control and to reduce the causes responsible for any of the disturbances.

I.2.2. Objective 2. To promote the conservation of threatened species and to set up effective and adapted protection for sensitive sites.

RAC/SPA with the help of its partners and the Contracting Parties want to set up real synergy so as to create new Marine Protected Areas and to strengthen the existing areas and also to seek new approaches for a more targeted management and conservation. The aim is to work together to initiate a network of Protected Areas which would respond to the expectations of the local communities in terms of sustainable development and which would also make it possible for endangered species to find sites of refuge where their populations could flourish.

I.2.3. Objective 3. Propose measures to reduce the threats to biodiversity

The threats must be better identified and practical and suitable measures are to be proposed to reduce them, with particular reference to climate change, accidental pollution with hydrocarbons and the non-sustainable exploitation of marine resources.

I.2.4. Objective 4. Improve knowledge sharing on marine biodiversity and access to information on a regional level.

RAC/SPA wishes to strengthen the exchange between the different regional actors for better dissemination of scientific knowledge in the domains within its sphere of competence by continuing to set up the specific bibliographical database online and by strengthening the scientific watch.

I.2.5. Objective 5. Strengthen the competence of national stakeholders and improve awareness creation

The Centre intends to promote training workshops for those involved in the conservation of biodiversity and also a partnership between the Parties and an exchange of experience, and also to set up evaluation tools to ensure that the training provided is truly effective.

II. RESULTS EXPECTED

Results of objective 1. A better knowledge of the state of Mediterranean biodiversity and regular monitoring so as to establish suitable management measures and to intervene effectively in case of a clear threat.

Results of objective 2. Improved management of threatened species and sites which are important for the maintenance of biodiversity and better cooperation between partners and better assistance and cooperation with the contracting Parties.

Results of objective 3. Provide the Parties with technical tools to reduce the pressures on biodiversity.

Results of objective 4. Creation of a regional, functional exchange Centre and better access to information for the decision-makers, stakeholders and the general public.

Results of objective 5. Capacity building of stakeholders on a national level in terms of study, management and monitoring of marine and coastal biodiversity, evaluation of the efficacy of the training supported by the Centre and better awareness creation amongst the general public.

III. Draft Work Programme

III.1. Programme relating to objective 1: inventory, mapping and surveillance of Mediterranean marine and coastal biodiversity

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (* 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SAP/BD Protocol (Art. 15) SAP-BIO (Priority 2.1.) Decisions 15th COP	Mapping and characterization of significant Mediterranean benthic habitats	Located sensitive habitats and remarkable sites worth protecting, monitoring and identified	RAC/SPA, Blue Plan, Contracting Parties concerned	Surface area of mapped areas and/or inventoried coastline. Number of FSD compiled, number of sites studied	IUCN, WWF, AECID. CE	12		30[1]	10		20[2]
SAP-BIO (Priority 2,1 and 2.2.2.)	Programme for mapping key-habitats.	Work programme to fill in gaps on distribution of priority established and submitted habitats.	RAC/SPA	Programme established and submitted		10					
SAP/BIO (Priority 2.1.) Decisions 15th COP Vegetation Action Plan ,	Implementation of monitoring networks	Improved monitoring of biodiversity and important habitats	RAC/SPA, Contracting Parties concerned, MAP, Blue Plan	Number of sites monitored or SPAs taken into account, Number of sensitive habitats or monitored species	National partners and Partners of "Vegetation " Action Plan	20			20		

[1 &d 2] Project DCI-ENV/2007 – 143939/RMD (biodiversity part of the Large Marine Ecosystems Partnership" project

III.2. Programme pertaining to objective 2: Conservation of habitats, sensitive species and sites

III.2.1. Objective 2A – Conservation of sensitive habitats and sites

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SPA/BD Protocol (Art.9) Decision 15th COP (IG 17/12)	Ordinary evaluation of SPAMIs registered on the list in 2003 and 2005	Conformity between the list registration criteria and the SPAMIs registered in 2003 and 2005 respected and maintained or better efficacy of SPAMIs in terms of controlled conservation of biodiversity	RAC/SPA, Contracting Parties concerned	% of SPAMIs evaluated	Managers and/or stakeholders of SPAMIs concerned, national experts				5		
SPA/BD (Art.9) Decision 15th COP	Better representativity of SPAMI network	Increased No. of SPAMIs, better representativity of network in terms of geographical distribution of habitats and protected species	RAC/SPA, Contracting Parties concerned	Number of SPAMIs proposed for registration on list	IUCN, WWWF, ACCOBAMS, MedPAN	14					
SPA/BD Protocol (Art. 5) SAP-BIO (priorities 2.2.3, 2.2.4. 2,2,5) MSSD (Art.2.7)	Implementation of MedMPANet project: - Establishment of priority actions for the creation of MPA - Identification of stakeholders and potential partners - Characterization of marine sites likely to become PMAs - Ecological evaluation of new sites of conservation interest	Priority actions identified Stakeholders and partners identified Potential sites inventoried and evaluated	RAC/SPA, Contracting Parties concerned, MAP	List of priority actions identified List of potential stakeholders and partners No. and/or % of sites of conservation interest	WWF, Conservatoire du Littoral, IUCN, UN-FAO, CGPM, EC, AECID, FFEM			[3] 75 25 170 250			[4] 40 10 85 195

[3 & 4] Project DCI-ENV/2007 -143939/RMD (biodiversity part of Large Marine Ecosystems Partnership project)

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SAP-BIO (priorities 2.2.3, 2.2.4, 2.2.5 and 2.2.6 MSSD (Act. 2.7)	Implementation of regional work programme of RAC/SPA on MPA, country assistance to improve SPA network and connectivity between SPAs	Better efficacy of SPAs (creation of new areas, strengthening of existing areas) and identification of measures to improve connectivity between the SPAs as means of adaptation to climate change	RAC/SPA, Blue Plan	Guidelines submitted to PF meeting, no. of actions undertaken for SPAs	IUCN, national partners, MedPan, WWF	10		67	20		
SPA/BD Protocol (Art.9) MSSD (Act.2.7)	Creation of SPAMIs on high seas including deep waters	Setting up processes to increase no. of SPAMIs on high seas, incl. deep waters : - Legal analysis of pre-identified sites - Cooperation with partners and monitoring committee - Information and awareness creation on SPAMIs - Requests	RAC/SPA, MAP, REMPEC	Number of protected areas proposed on high seas during year 2, number of information, awareness creation documents and reports produced	EC, UN-FAO, CGPM, IMO, PELAGOS, ACCOBAMS, UNEP REG SEAS, OSPAR, IUCN, CIESM			[5] 25 80 18 58			[6] 25 31
SAP-BIO (priorities 2.2.3, 2.2.4, 2.2.5 and 2.2.6) MSSD (Act.2.7)	Implementation of CAMP Almeria - Setting up cooperation process with users - Awareness creation and information actions - Proposals for planning and monitoring of MPA	Better implementation of SPA/BD Protocol and action plans in MPA	RAC/SPA, RAC/PAP, MAP, Blue Plan, RAC/PP, RAC/Info	Number of documents produced, report of cooperation process, ecological monitoring programme	Andalusia region, Spanish Ministry of the Environment I	10			10		

[5 & 7] Projet CE 21.0401/2008/519114/SUB/D2 (Establishment of MPA on high seas, incl. deep waters)

III.2.2. Objective 2B – Conservation of threatened species

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SPA/BD Protocol (Art.11 and 14) Monk seal Action Plan	Establishment of regional programme for conservation of the monk seal, based on that of the Atlantic region	Draft work programme for the 3 conventions submitted for adoption at the next PF meeting	RAC/SPA	Draft regional programme submitted	Bonn and Berne Conventions, Regional partners and Contracting Parties concerned		30				
SPA/BD Protocol (Art. 11 and 14 "Monk seal" Action Plan	Characterisation and monitoring of habitats and populations in collaboration with national institutions concerned	Better knowledge on monk seal population in the Mediterranean	RAC/SPA, Contracting Parties	Number of cameras set up and Number of monitoring reports made. Number and % of reproduction and resting caves known, proposed for protection.	National partners, IUCN		24			14	
SPA/BD Protocol (Art.11 and 14) "Cetaceans" Action Plan	Country assistance for implementation of actions for conservation of cetaceans, monitoring of strandings and participation in ACCOBAMS activities	Better conservation of cetaceans in the Mediterranean	RAC/SPA, REMPEC	Number of actions carried out for benefit of cetaceans	ACCOBAMS, FAO, CGPM, national partners concerned		20			10	
SPA/BD Protocol (art. 11 and 14) "Cetaceans" Action Plan	Evaluation of national Action Plans, identification of gaps and actions to promote conservation of cetaceans.	Evaluation of activities carried out within the framework of the Action Plan and proposed priority actions to be undertaken	RAC/SPA, Contracting Parties	List of priority actions submitted to the next PF meeting	ACCOBAMS, regional and national partners concerned				5		
SPA/BD Protocol (Art. 11 and 14) Decision 15th COP (IG 17/11 "Turtles" Action Plan	Establishment of guidelines for monitoring of nesting sites and standardisation of monitoring methods incl. study of sex ratio	Standardisation of monitoring methods of reproduction sites and study of sex ratio	RAC/SPA, Contracting Parties, Blue Plan	Guidelines submitted for next PF meeting	IUCN, national partners, Action Plan partners, NGO		5				

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SPA/BD (Art.11 and 14) Decision 15th COP (IG 17/11 "Turtles" Action Plan	Assistance to countries for the implementation of Action Plan and impact evaluation of climate change on marine turtles	Better conservation of marine turtles	RAC/SPA, Contracting Parties, Blue Plan	Number activities carried out for the conservation of marine turtles	IUCN, national partners, Action Plan partners, NGO		15			20	
SPA/BD Protocol (Art. 11 and 14) "Vegetation" Action Plan	Assistance to countries for the implementation of "vegetation" Action Plan: - mapping of marine vegetation - setting up monitoring networks	Distribution of marine vegetation and better monitoring	RAC/SPA, Contracting Parties concerned	Number of sites mapped or monitored	Action Plan partners	[7]			[8]		
SPA/BD Protocol (Art. 11 and 14) "Cartilaginous Fish" Action Plan	Assistance to countries for the implementation of Action Plan in partnership with relevant organisations	Improved conservation of cartilaginous fish populations	RAC/SPA	Number of national/sub-regional/regional reports (CGPM, Bonn, RAC/SPA, IUCN) prepared on ongoing work and projects	UN-FAO, CGPM, IUCN, Bonn Convention, Action Plan partners		20			15	
SPA/BD Protocol (Art.11 and 14) Decision 15th COP (IG 17/11) "Birds" Action Plan	Assistance to countries for the implementation of Action Plan	Better monitoring of bird populations of annex II	RAC/SPA	Number of activities undertaken	Birdlife, NGOs, Action Plan Partners		8				
SPA/BD Protocol (Art. 11 and 14) Decision 15th COP (IG 17/15) "Coralligenous" Action Plan	Organisation of meeting of experts to define and standardize monitoring methods of coralligenous formations	Standardized protocol established for follow-up and monitoring of coralligenous	RAC/SPA	Guidelines on monitoring methods of coralligenous formations for submission at next PF meeting	IUCN, national partners, RAMOGE, CIESM		26				

[7 & 9] funding scheduled in objective 1

III.3. Programme relating to objective 3 – Evaluation and mitigation of threats to biodiversity

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SPA/BD (Art. 14) SAP-BIO (Priority 2.3.4) Decision 15th COP (IG 17/11) "Introduced species" Action Plan	Strengthen regional and sub-regional mechanisms of data collection and dissemination of information on non-indigenous invasive species	Better dissemination of information on sightings of new introduced species	RAC/SPA	Number of species inventoried/ Number of countries/institutions supporting this information gathering mechanism	IUCN		15			10	
SPA/BD (Art.14) SAP-BIO (Priority 2.3.4.) Decision 15th COP (IG 17/11) "Introduced Species " Action Plan	Strengthening of legal instruments and national capacity for management of ballast water	Reduction of introduced species through ballast waters and strengthening of necessary legal tools	RAC/SPA, REMPEC, Contracting Parties concerned	Number of legal instruments applied/ number of trainees trained on various aspects of ballast water management	IMO, national partners		25				
SAP-BIO (Priority 2.3.2) MSSD (Act. 2.7)	Evaluation of interactions between fishing and aquaculture and conservation of threatened species and sensitive habitats and propose guidelines to reduce these interactions	Reduction of threats, due to exploitation of living resources, to biodiversity	RAC/SPA, RAC/CP	Guidelines submitted to next PF meeting	FAO, CGPM, ADRIAMED, COPEMED II, MEDSUDMED		15			10	
SAP-BIO (priority 2.3.1, 2.3.2, 2.3.8 and 2.3.9) MSSD Act. 2.7. Decision 15th COP	Evaluate the impact of threats on biodiversity in the SPAs (e.g. pollution, tourism, climate change) and propose indicators and monitoring methods	Tools to monitor identified impacts and monitoring programme set up	RAC/SPA, Blue Plan, RAC/PAP	Indicators identified, monitoring protocols or emergency plans set up	UNFCC secretariat, CELRL, IUCN		20			23	

III.4. Programme relating to objective 4 - Development of research to improve knowledge and fill gaps on biodiversity

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SPA/BD (Art. 20) SAP-BIO (priority 2.4)	Oceanographical survey to identify the MPAs on high seas, incl. deep water zones	Better scientific knowledge on sectors concerned	RAC/SPA, MAP, REMPEC	Dossiers and reports to complete the dossiers on SPAMIs for 3 potential sites	EC, UN-FAO,CGPM, PELAGOS, ACCOBAMS, UNEP REG SEAS, CIESM, French Agency of Marine Protected Areas			124[9]			44[10]
SPA/BD (Art.20) SAP-BIO (Priority 2.4) "Birds" Action Plan	Organisation of 2nd symposium on marine birds and regional knowledge updating on conservation of bird species in Annex II	Better dissemination of scientific knowledge on bird species of Annex II	RAC/SPA	Number of participating scientists and Symposium reports ready	Birdlife, "Bird" Action Plan partners, NGOs concerned				25		
SPA/BD Protocol (Art.20) SAP-BIO (Priority 2.4) "Vegetation" Action Plan	Organisation of IV symposium on marine vegetation and regional knowledge update on vegetation species in Annex II	Better dissemination of scientific knowledge on marine vegetation species in Annex II	RAC/SPA	Number of participating scientists and Symposium reports ready	"vegetation" Action Plan partners	25					
SAP-BIO (Priorities 2.4, 2.5.1 and 2.6.1.)	Developing RAC/SPAs web site into an Information Exchange Centre on biodiversity	Better communication between the Centre, Contracting Parties and partners	RAC/SPA, RAC/Info	Number of connections on web site, number of flash news produced		10			10		

[9 & 11] Projet CE 21.0401/2008/519114/SUB/D2 (establishment of MPA on high seas, incl. deep water zones)

SAP-BIO (Priorities 2.4 and 2.6.1)	Updating of different information section of MEDGIS (meadows, coralligenous..) and updating the regional bibliographical data bases	Better dissemination of scientific knowledge on marine and coastal biodiversity on regional level	RAC/SPA, RAC/Info	Number of bibliographical databases created, Number of references in each database, Number of geo-referenced data, integrated into MEDGIS		10			10		

III.5. Programme relating to objective 5. – Capacity building to improve coordination, technical assistance and better awareness creation in general public

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SAP-BIO (priority 2.5.2) MSSD (Act. 2.7)	Establishment of guidelines within MedMPAnet on good practice and problems linked to climate change impacts on biodiversity and assistance in elaborating strategy and funding requests	Better knowledge on climate change and funding mechanisms	RAC/SPA, Blue Plan	Number of reference documents, guidelines and information documents produced	EC, WWF, AECID, FFEM, Conservatoire du Littoral, IUCN			[11] 55	10		[12] 80
SAP-BIO (priority 2.5.2) MSSD (Act. 2.7)	Training and capacity building actions scheduled within the framework of the MedMPAnet project for: - national capacity building to promote an SPAs representative network - to train managers, professionals and relevant authorities in identifying demonstration sites, in management, planning and ecological monitoring of MPAs - to train stakeholders in participative mechanisms	To improve competence of stakeholders concerned in terms of management, planning and monitoring of MPAs	RAC/SPA	Number of training activities carried out, as well as workshops and persons trained	EC,WWF, AECID, FFEM, Conservatoire du Littoral, IUCN			55 55 50			130 45 50

[11 & 13] Projet DCI-ENV/2007-143939/RMD (biodiversity part of “Large Marine Ecosystems Partnership” programme

SAP-BIO (Priority 2.5.2) MSSD (Act.2.7) “Coralligenous” Action Plan	Organisation of training workshop on study and monitoring methods of coralligenous formations	Better training of national stakeholders in studying and monitoring of coralligenous formations	RAC/SPA	Number of persons trained	RAMOGE, IUCN, national partners concerned				30		

Political relevance (ref. to provisions Of Convention, protocols and Party meeting decisions)	Planned activities/actions	Expected results	Responsibility (description of responsibility elements of MAP components and of contracting Parties	Implementation indicators	Initiatives / of partnerships corresponding	Budget (X 1000 €)					
						2010			2011		
						MTF	CE	Autre	MTF	CE	Autre
SAP-BIO (Priority 2.5.2) MSSD (Act.2.7)	Organisation of training workshop on taxonomy during field trips to characterize national sites within the framework of the MedMPAnet programme	Improve the taxonomic knowledge of national stakeholders	RAC/SPA	Number of persons trained	Regional organisations	10					
SAP-BIO (Priority 2.5.2) MSSD (Act.2.7) "Turtles" Action Plan	Capacity building on conservation of marine turtles	Capacity building of national stakeholders on protection of nesting sites and care of injured animals.	RAC/SPA	Number of persons trained	NGOs, Action Plan partners	12			15		
Organisation of the 10th meeting of National Focal Points									75		
TOTAL						143	223	1137	240	107	755