

**Decision IG.21/4**

**Action Plans under the Specially Protected Areas and Biological Diversity Protocol including Monk Seal, Marine Turtles, Birds, Cartilaginous Fishes, and Dark Habitats**

*The Eighteenth Meeting of the Contracting Parties,*

*Recalling* Article 11 of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean hereinafter referred to as the “SPA/BD Protocol”, on national measures for the protection and conservation of species,

*Recalling* Article 12 of the SPA/BD Protocol, on cooperative measures for the protection and conservation of species, and in particular, its paragraph 3 on the formulation and implementation of action plans for their conservation and recovery,

*Recalling* that the Sixteenth Ordinary Meeting of the Contracting Parties to the Barcelona Convention approved the proposal made by the Regional Activity Centre for Specially Protected Areas (herein after referred to as “SPA/RAC”) to prepare a Mediterranean strategy for the conservation Monk Seal,

*Considering* that the old action plan for the management of Monk Seal in the Mediterranean continues to be valid as far as its contents and general principals are concerned,

*Considering* that such programmes and strategies are intended to promote and undertake concerted and effective actions at the local level to reverse the Monk Seal critical status, and to encourage the concerned States to implement a series of joint measures aiming at re-establishing the favorable conservation status of Monk Seal populations and their natural habitat in the region,

*Considering* the “Action Plan for the conservation of Mediterranean Marine turtles” adopted by the Contracting Parties in Malta, in October 1999, and more particularly its Section G. concerning the assessment of the implementation and revision of the Action Plan,

*Considering* the “Action Plan for the conservation of Bird species listed in Annex II of the SPA/DB Protocol” adopted by the Contracting Parties in Catania, in November 2003, and more particularly its Section 5.5 concerning the assessment of the implementation and revision of the Action Plan,

*Considering* the “Action Plan for the conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea” adopted by the Contracting Parties in Catania, in November 2003,

*Considering* the “Updated Activity Programme for the implementation of Action Plan for the conservation of Mediterranean Marine Turtles” adopted by the Contracting Parties, in Almeria, in January 2008,

*Considering* the “Updated Activity Programme for the implementation of Action Plan for the conservation of Bird species listed in Annex II of the SPA/DB Protocol” adopted by the Contracting Parties in Almeria, in January 2008,

*Considering* the “Updated Activity Programme for the implementation of Action Plan for the conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea” adopted by the Contracting Parties, in Marrakesh, in November 2009,

*Taking into account* Decision IG.19/12 related to the “Amendments of the list of Annexes II and III of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean” adopted by the Contracting Parties, in Marrakech, in November 2009, and more particularly the marine and coastal bird species newly included in Annex II to the Protocol "List of endangered or threatened species",

*Taking into account* Decision IG.20/5 related to the “Amendments of the list of Annexes II and III of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean” adopted by the Contracting Parties, in Paris, in February 2012, and more particularly the cartilaginous fishes species removed from the Annex III to the Annex II to the SPA/BD Protocol,

*Noting* the work accomplished by SPA/RAC in order to report on the Action Plan for the conservation of the Mediterranean Marine Turtles and the Action Plan for the conservation of Bird species listed in Annex II to SPA/BD Protocol achievements over the period 2007-2013,

*Noting* the work accomplished by SPA/RAC in order to report on Action Plan for the conservation of Cartilaginous Fishes achievements over the period 20010-2013,

*Noting* with satisfaction the work accomplished by the Meeting of the ad hoc group of Mediterranean experts, nominated in consultation with the Contracting Parties and relevant partner organizations (Marseilles (France), May 2013) for drafting the Action Plan for the conservation of dark assemblages of the Mediterranean (marine caves, canyons, etc...),

*Taking into account* the proposal by SPA/RAC Focal Points Meeting (Rabat, 2-5 July 2013) of updated timetables for the implementation of the Action Plan for the conservation of Mediterranean Marine Turtles, the Action Plan for the conservation of Bird species listed in Annex II to SPA/BD protocol and the Strategy for the conservation of Monk Seals in the Mediterranean,

*Being Inspired* by the progress of the work carried out by Barcelona Convention/UNEP-MAP to implement the Ecosystem Approach Roadmap with a particular focus on the commonly agreed ecological objectives, operational objectives, indicators, good environmental status and respective targets with regards to biodiversity and fisheries and the need to fully streamline their application in the work of all Barcelona Convention/UNEP-MAP components, as well as the need to fully harmonize implementation of the Action Plans under the Biodiversity Protocol with the Mediterranean Ecosystems Approach (EcAp) cycle,

***Decides to:***

- Adopt the Regional strategy for the conservation of Monk Seals in the Mediterranean (2014-2019), as contained in Annex I to this Decision;
- Adopt the Work Programme and Implementation Timetable of the Action Plan for the conservation of Mediterranean Marine Turtles in the Mediterranean Sea for the period 2014-2019, as contained in Annex II to this Decision;
- Adopt the Work Programme and Implementation Timetable of the Action Plan for the conservation of Bird species listed in Annex II to the SPA/BD Protocol in the Mediterranean for the period 2014-2019, as contained in Annex III to this Decision;

- Adopt the Work Programme and Implementation Timetable of the Action Plan for the conservation of Cartilaginous Fishes in the Mediterranean Sea for the period 2014-2019, as contained in Annex IV to this Decision;
- Adopt the Action Plan for the conservation of Habitats and Species associated with seamounts, underwater caves and canyons, aphotic engineering benthic invertebrates and chemo-synthetic phenomena, in the Mediterranean Sea (Dark Habitats Action Plan) as contained in Annex V to this Decision;

**Requests** the Contracting Parties to take the necessary measures for the implementation of the updated Work Programme and Implementation Timetables, the Regional Strategy for the conservation of Monk Seals in the Mediterranean and the Dark Habitats Action Plan and report on their implementation according to the cycle and format of the MAP reporting system;

**Requests** SPA/RAC to undertake the necessary actions to assist the Contracting Parties, at their request to fulfill their obligations pertaining to the implementation of the updated Work Programme and Implementation Timetables the Mediterranean Strategy for the conservation of Monk Seals and the Dark Habitats Action Plan by supporting and/or coordinating actions where necessary and to further apply the ecosystem approach, in collaboration with the relevant organisations.



## **Annex I**

### **Regional Strategy for the conservation of Mediterranean Monk Seal**



## Table of contents

<b>1. Executive Summary</b> .....	77
<b>2. Background</b> .....	79
2.1. Introduction.....	79
2.2. Summary of the status of and threats to monk seals in the Mediterranean .....	80
2.3. Why a change of strategy is needed if monk seals are to be saved from extinction .....	84
2.4. Monk seal functions and values in the Mediterranean .....	87
<b>3. A region-wide Strategy for the Conservation of Monk Seals in the Mediterranean</b> .....	88
3.1. Rationale for the Strategy .....	88
3.2. The Strategy.....	91
3.2.1. Vision .....	91
3.2.2. Goals.....	91
3.2.3. Goal Targets, Objectives and Objective Targets .....	91
3.2.4. Revision of the Strategy .....	99
<b>4. Acknowledgments</b> .....	100
<b>5. List of references</b> .....	101





## 1. Executive Summary

The Mediterranean monk seal, one of the most endangered mammals in Europe and one of the world's most endangered marine mammals, has been classified as Critically Endangered in IUCN's Red List for the past 17 years. On the one hand this condition is of great concern, because it testifies to our evident inability of keeping the species away from under the Damocles' sword of imminent extinction, but on the other hand it is also good news, because the species in fact is not extinct yet, particularly as far as the eastern Mediterranean is concerned. Such status quo, however, cannot be taken as a reason for complacency. In spite of the species' dire conservation status, monk seal recovery in the Mediterranean is still possible, but success will demand uncompromising determination and greater commitment than in the past from the part of the concerned governments and civil societies.

Faced with the perspective of investing the considerable amount of time, effort and resources needed to reverse the critical conservation status of monk seals in the Mediterranean, many could find it legitimate to question the ethical aspects of dedicating to a single species far greater attention than to most of the region's other marine organisms. Indeed, dedicating to monk seal conservation extraordinary attention and resources is legitimate for a number of reasons: a) because the species is protected by legislation at all levels (national, regional, international, and where appropriate European); b) because the species has high intrinsic value under many respects; c) because conservation actions favoring monk seals are likely to extend their benefits to several other species and to the environment they are part of; and finally, d) because the extinction of this highly symbolic and charismatic animal would cause a devastating loss of credibility to Mediterranean institutions, national and supra-national. This is why a forceful and effective monk seal conservation strategy, embraced regionally as a best practice example, should become solidly integrated within a wider strategy for the conservation of the Mediterranean marine environment.

During the past decades, with few very localized exceptions no discernable progress was achieved in the effort of recovering monk seals in the Mediterranean, probably due to a combination of shortcomings which include the failure to implement their conservation commitments by many countries, lack of coordination and continuity in monk seal conservation action, and insufficient attention to the human component of the monk seal conservation problem. An Action Plan adopted two decades ago by the Contracting Parties to the Barcelona Convention, while still valid in terms of its general contents and stated principles, must urgently be replaced by a Strategy based on a clear Vision, to be attained through interconnected Goals, Objectives and Actions which are specific, measurable, attainable, relevant, and time-bound.

This document proposes a Strategy, having the following Vision: *“Over the next two decades, the ecological recovery of monk seals in the Mediterranean will deem to have occurred, when multiple colonies have become established within all major habitats of their historic range, interacting in ecologically significant ways with the fullest possible set of other species, and inspiring and connecting human cultures”*.

The human threats that are jeopardizing monk seal survival are many, however a few of these are overwhelmingly important, and addressing them with the greatest energy and determination is likely to create the greatest and fastest benefits. Accordingly, this Strategy recommends the adoption by Range States of a triaging approach, recognizing that the two top-ranking threats to monk seals in the Mediterranean are the unchecked deterioration of the species' critical habitat (including disturbance), and deliberate killings. Here is where the greatest attention is urgently needed.

A second character of the Strategy derives from the need of tailoring action to geographical differences in the conservation status of monk seals across the region, and the consequent different priorities and responsibilities saddled onto the various monk seal Range States. To handle this challenge, Mediterranean countries were assigned to three groups: A: countries where monk seal breeding has been reported after year 2000; B: countries with evidence of monk seal presence, but with no breeding reported after year 2000; and C: countries where no monk seals have been reported since at least year 2000. Group A countries is where action is most urgent, because at the moment these countries offer the greatest hope for the survival of the species in the Mediterranean. Group B countries are also important, because they contain monk seal critical habitat which is likely to be re-colonized if conditions are favorable, particularly if actions in Group A countries are successful. Finally, Group C countries are important as well because they contain monk seal critical habitat, and because the return of monk seals there will become more likely if actions in Group B countries are successful.

To fulfil the Vision, the Strategy identifies four Goals. The first Goal relates to the creation of a solid, long-term conservation support structure at the international level, whereas the other three Goals relate to each of the three Groups the various countries have been assigned to. More specifically:

**Goal 1.** Mediterranean Range States implement this Strategy in pursuance of the Vision, through the expeditious development and adoption of appropriate national policies and administrative frameworks, and with the effective, coordinated support from relevant international organizations and civil society.

**Goal 2.** Monk seal breeding nuclei in sites located in “Group A” countries are effectively protected from deliberate killings and habitat degradation, so that seal numbers in such sites increase and seals are able to disperse to the surrounding areas.

**Goal 3.** Monk seal presence in sites where they are occasionally seen today in “Group B” countries is permanently established and breeding resumes. “Group B” countries are upgraded to “Group A”.

**Goal 4.** Monk seal presence is again reported in the species’ historical habitat in “Group C” countries, and these “Group C” countries are upgraded to “Group B”. Once all “Group C” countries are upgraded, Group C is deleted.

The suggested time horizon of the Strategy is six years: 2013-2019. A mid-term assessment in 2016 is also recommended.

## 2. Background

### 2.1. Introduction

Since 1985 the Mediterranean monk seal was recognized within the framework of the Barcelona Convention as a species to be protected as a matter of priority. In that year, during their fourth ordinary meeting, the Contracting Parties adopted a declaration – referred to as the Genoa Declaration – which included, amongst the priority targets to be achieved in the decade 1986-1995, the “protection of the endangered marine species” with a specific reference to the monk seal. Following the Genoa Declaration, an “Action Plan for the Management of the Mediterranean Monk Seal (*Monachus monachus*)” was adopted by the Convention’s Contracting Parties (UNEP-MAP-RAC/SPA & IUCN 1988, UNEP-MAP-RAC/SPA 2003a). The main aims of the Barcelona Convention’s Monk Seal Action Plan were: to reduce adult mortality; to promote the establishment of a network of marine reserves; to encourage research, data collection, and rehabilitation programmes; to implement information programmes targeting fishing communities and various other stakeholders; and to provide a framework for the coordination, review and financing of relevant activities.

The Regional Activity Centre for Specially Protected Areas (RAC/SPA) of Tunis is the body charged with facilitating the implementation of the species’ Action Plans within the Barcelona Convention context. Accordingly, in addition to assisting countries to carry out actions for the protection of monk seals through data collection, research, training and public awareness, during the past decades the RAC/SPA also organized meetings, produced documents on the status of the species, and promoted studies to identify potential monk seal critical habitat in so-called low-density areas (e.g., Albania, Algeria, Croatia, Cyprus, Libya, Morocco, Syria and Tunisia).

While all these efforts so far have served mostly the purpose of making progress in terms of greater knowledge and awareness, no discernable advance is yet apparent in the improvement of the species’ conservation status. As a consequence, the Mediterranean monk seal has continued to be listed as Critically Endangered in IUCN’s Red List since 1996 (Aguilar & Lowry 2008).

A strategy shift is clearly necessary if monk seals are to be saved from extinction in the Mediterranean. With this view, and with the aim of reinforcing the commitment of the Mediterranean countries and their active participation to the recovery of the species, in 2009 the Contracting Parties to the Barcelona Convention approved during their 16<sup>th</sup> Meeting in Marrakesh the proposal by the RAC/SPA of preparing a set of subregional<sup>1</sup> and national programmes for the conservation of monk seals in the Mediterranean. Such programmes are intended to promote and undertake concerted and effective actions at the local level to reverse the species’ critical status, and to encourage the concerned states to implement a series of joint measures aiming at re-establishing the favorable conservation status of monk seal populations and their natural habitat in the region.

While targeted actions that are locally grounded and tailored to specific peculiarities and needs are likely to be more effective than more general statements of purpose having a very wide horizon, a strong need remains of framing all these separate actions under the coordination of a regional umbrella. Monk seals are a highly mobile species, their habitat is shared by many nations, and includes international waters as well.

In this document a region-wide set of strategic actions is drafted to support monk seal conservation actions in the region, taking into account the shared character of monk seal

---

<sup>1</sup> Subregional = concerning a sub-set of the Mediterranean region.

ecology and its conservation concerns, at the same time allowing for the existing significant differences of the species' conservation status across the Mediterranean.

## 2.2. Summary of the status of and threats to monk seals in the Mediterranean

The Mediterranean monk seal, *Monachus monachus*, is classified as Critically Endangered in IUCN's Red List (Aguilar & Lowry 2008). It is considered one of the most endangered mammals in Europe and one of the world's most endangered marine mammal.

The species is present in the Mediterranean Sea, in the Marmara Sea (probably <10 individuals, C. Kiraç, pers. comm.) and in the North-eastern Atlantic Ocean, but is considered extinct in the Black Sea (Kiraç 2001)<sup>2</sup>. Atlantic monk seals have been geographically separated from Mediterranean seals for sufficient time to develop noticeable morphological (Van Bree 1979) and genetic (Pastor et al. 2007) differences. Accordingly, in this document monk seals in the Mediterranean will be treated as an "evolutionarily significant unit" (ESU), whose conservation can be addressed independently from the population(s) living in the Atlantic.

This document will make no attempt at describing in detail the status of *Monachus monachus* throughout its Mediterranean range, because such descriptions already abound (e.g., Sergeant 1984, Sergeant et al. 1979, UNEP-MAP-RAC/SPA 1994, UNEP-MAP-RAC/SPA 2003b, UNEP-MAP-RAC/SPA 2006a, Aguilar & Lowry 2008), and it would now seem advisable to concentrate efforts on conservation action rather than on repetitive academic analyses (Notarbartolo di Sciara 2010).

What follows is a concise summary of the latest distributional knowledge which is instrumental to the construction of a meaningful region-wide conservation strategy. The treatment of locations where breeding nuclei of monk seals still persist is here separated from that of the rest of the Mediterranean, where individual seals have only episodically appeared in recent years.

Surviving breeding nuclei are the last remaining significant assets of the species in the Mediterranean and should be given the highest priority as far as conservation action is concerned. To the best of the currently available knowledge such nuclei can still be found in the following countries:

- **Greece.** Notable breeding concentrations of monk seals exist in the following locations (Notarbartolo di Sciara et al. 2009b, supplemented by more recent information where available):
  - Northern Sporades (52 individuals, with a mean annual pup production of >8);
  - North Karpathos and Saria (23 indiv., mean pups/year <4);
  - Kimolos and Polyaigos (49 indiv., mean pups/year <8);
  - Gyaros (60 indiv., mean pups/year 10: MOm, pers. comm.);
  - Ionian Islands: Kefallinia, Lefkada, Ithaca and Zakynthos (about 20 indiv. according to Panou 2009).

In addition to the above locations, monk seals are widely, albeit thinly distributed over the entire maritime territory of Greece, with occasional pupping occurring in many places. This makes it extremely hard, for the time being, to produce a realistic total population estimate of monk seals in Greece.

---

<sup>2</sup> Although Güçlüsoy et al. (2004) hypothesized that 2-3 individuals might still be surviving there at the time of their writing.

- **Turkey.** Monk seals are scattered along the Turkish Aegean and Mediterranean coasts, all the way from the Dardanelles to the border with Syria, with three main breeding concentrations (Güçlüsoy et al. 2004, UNEP-MAP-RAC/SPA 2011c):
  - Northern Aegean (35 indiv.);
  - Southern Aegean (28 indiv.);
  - Mediterranean coast (Levantine Sea)(42 indiv.: Gucu et al. 2009b).

Although no genetic proof is provided, evidence exists that due to habitat contiguity the seals found in Greek and Turkish Aegean waters are intermixing (Kıraç & Güçlüsoy, pers. comm.).

- **Cyprus.**
  - probably 6-7 individuals left; evidence of pupping still occurring, although solely based on the finding of one dead newborn in 2009 (UNEP-MAP-RAC/SPA 2011b);
  - from 3 to 17 individuals estimated in 2006-7; a young seal observed there was likely to have been born locally (Gucu et al. 2009a).

To conclude about locations where monk seal breeding still occurs, two countries (Greece and Turkey) stand out as the most important repositories for the species in the Mediterranean, where the greatest effort should be invested to ensure the survival of a critical mass, able to eventually support the future recolonisation of the entire region. Quite importantly, it must be noted that population estimates in Greece and Turkey, in spite of continuing high concern for the very low absolute numbers, have not significantly decreased during the last quarter of century (e.g., compare with Marchessaux 1989).

The recent (i.e., post-2000) evidence of breeding having occurred in Cyprus also requires the greatest attention, considering the very small and fast declining number of seals still present on that island

Evidence of monk seal episodic occurrence elsewhere in the Mediterranean - albeit with no conclusive sign of breeding success - was provided by a remarkable number of recent sightings. These are a powerful testimony of the species' potential for recolonising its former habitat in several countries, if only such countries were to give it a chance.

Notable appearances included (listed clockwise from the west):

- **Spain.** Reliable information exists of an individual photographed in 2008 at Isla del Toro, Mallorca, Balears, the first documented presence in European Spain in 50 years (Anon. 2008). More sightings in the area are reported by Font & Mayol (2009), summarized by Gazo & Mo (2012). By contrast, the small colony of seals known to have been surviving in the Chafarinas archipelago, along the African coast, is presumed extinct (Anon. 2004).
- **Italy.** Mo (2011) presents information on 81 observations documented between 1998 and 2010, corresponding to a minimum of 35 distinct sighting events. During the last decade monk seals made their appearance in Liguria, Tuscany, Sardinia, Latium, Sicily, Calabria and Apulia.
- **Croatia.** Antolovic et al. (2007), based on numerous sighting reports, considered that monk seals were still present in Croatian coastal waters during the 2000-2005 period, particularly around the offshore islands of the Dalmatian Archipelago. Gomerčić et al. (2011) list 31 sightings of monk seals in Croatia since 2005, including an adult female repeatedly photographed and filmed in the Kamenjak Natural Reserve, near the southern tip of the Istria peninsula.
- **Albania.** Although very little information exists about the status of monk seal habitat in the country (UNEP-MAP-RAC/SPA 2005c, UNEP-MAP-RAC/SPA 2012), a very

recent documented sighting in the area south of Vlore on 4 August 2012 testifies to the presence of the species (Anon. 2012).

- **Syria.** The continued presence of the species is mentioned by Mo et al. (2003) and Gucu (2004). More recently, documented proof was provided by Jony & Ibrahim (2006), with a sighting 10 km north of Latakia in April 2005, combined with several reports by local fishermen.
- **Lebanon.** Two separate monk seal encounters were filmed underwater in Northern Lebanon, on 15 August and 4 September 2010, likely involving the same individual seal (Anon. 2010).
- **Israel.** After an absence from the country of more than 50 years, monk seals were reported along the Israeli coast 45 times between November 2009 and September 2010; one report included photographs of a young female resting inside the breakwater of Herziliya Marina (Scheinin et al. 2011). Although it is unclear whether all the sightings mentioned above referred to only one individual or more, Scheinin et al. (2011) suggest that there likely were at least two.
- **Egypt.** Formerly considered as having disappeared from the country for about 20 years, the presence of at least one monk seal was documented from Marsa Matrouh, western Egypt, in March 2011 (UNEP-MAP-RAC/SPA 2011a, Notarbartolo di Sciarra & Fouad 2011).
- **Libya,** particularly in Cyrenaica (the eastern-most portion of the coast), apparently had an estimated 20 individuals around the 1970s, as reported by Sergeant et al. (1979). Although current numbers are unknown, in spite of the considerable effort invested in finding out (Hamza et al. 2003), the recent finding (25 March 2012) of a dead young female in the area of Ain El Ghazala, near the Egyptian border, testifies to the continued presence of the species in that country (RAC/SPA 2012, Alfaghi et al. 2013).

Other Mediterranean countries where monk seals are presumed to still occasionally occur, although no recent sightings have been reported to our knowledge, include **Tunisia** (UNEP-MAP-RAC/SPA et al. 2001), **Algeria** (UNEP-MAP-RAC/SPA 2006b, UNEP-MAP-RAC/SPA 2012), and **Morocco** (Mo et al. 2011). However, and in stark contrast with the situation in the Eastern Mediterranean, the decline of the species has been particularly spectacular in north-west African countries, considering that only three decades ago estimates of monk seal numbers from that area probably exceeded 140 individuals, of which about 20 in Tunisia (Marchessaux 1986), 100 in Algeria (Marchessaux 1977), and 20 in Morocco (Avella & Gonzalez 1984, Marchessaux 1989).

Locations not listed above include those where monk seals are today sadly considered extinct (**France, Monaco, Malta**), as well as countries where the presence of monk seals has not been reported in recent years (**Slovenia, Bosnia Herzegovina, Montenegro**). However, the condition in the latter countries is likely more similar to that of neighboring States (e.g., Croatia, Albania) than to that of the former countries, and could be explained in part by insufficient levels of sighting effort.

Threats to monk seal survival in the Mediterranean have been listed in minute detail by many authors (e.g., Ronald & Duguy 1979, Ronald 1984, UNEP-MAP-RAC/SPA 1994, UNEP-MAP-RAC/SPA 1998, Israëls 1999, UNEP-MAP-RAC/SPA 2003b, Aguilar & Lowry 2008). For example, an expert meeting held in Latakia, Syria, in September 2002 listed no less than 21 types of different threats to monk seals, grouped under four main headings: negative interactions with fishing activities, degradation and loss of habitat, disturbance, and pollution (UNEP-MAP-RAC/SPA 2003b).

While such exhaustive analyses might have been useful in past decades, when the conservation status of monk seals in the Mediterranean was not as dreadful as it has become lately, a strategic shift is recommended (Notarbartolo di Sciara 2010), with the adoption of a **triaging approach** by the countries where monk seals are still present in substantive numbers and breeding. A triaging approach involves identifying and singling out the top-ranking threats acting in the different locations, and intervening upon these with the greatest energy and determination, thereby taking the maximum advantage of the limited resources that are customarily made available by most Mediterranean governments to the protection of their marine environment and biodiversity. Such strategy may not allow to address all the threats that monk seals are facing, but will help countries to concentrate efforts on the pressure factors which are creating the greatest problems, and are likely to be more cost-effective than squandering the scarce available resources in too many directions, some of which are likely to be of minor relevance to conservation.

As already recognized decades ago in the “Action Plan for the management of the Mediterranean monk seal (*Monachus monachus*)”, the two top-ranking threats to monk seals in the Mediterranean are a) **mortality from deliberate killings**, and b) the **deterioration of critical habitat** (including **disturbance**). Here is where the greatest attention is urgently needed. A new strategy should recognize that the relative importance of such threats is not evenly distributed. For example, deliberate killings is one of the greatest problem in Greece (Androukaki et al. 1999); however, although this was also the case of Turkey decades ago (Berkes et al. 1979), the threat which ranks highest today in that country is habitat degradation, which takes many different forms (e.g., recreational boating, swimming, snorkeling and diving in prime habitat including caves, overfishing and intensive and illegal fishing such as with dynamite), but most importantly coastal development irreversibly destroying pristine coasts (Kıraç 2011). This reaffirms the need of tailoring strategic actions to local conditions, on the basis of a careful, location-specific threat analysis.

While the triaging strategy recommended above is intended for adoption by individual countries, actions having a wider, region-oriented scope (e.g., devising and implementing a contingency plan for single disastrous events such as a lethal epizootic outbreak or a massive oil spill within the species’ critical habitat, or conditions which may derive from catastrophic environmental change; support to awareness campaigns; support to rescue and rehabilitation programmes; coordination of and support to research and monitoring, including monitoring of mortality causes and levels) should be best implemented within a wider, supra-national coordination framework, in which national responsibilities are supported by international conservation organizations.

Undeniably, other threats such as bycatch<sup>3</sup>, prey depletion due to overfishing, illegal fishing practices (e.g., with dynamite), and pollution, can and do take their toll on monk seals, however these are pressure factors that all countries are supposed to address anyway, within their clear duty of ensuring that human activities at sea be sustainably managed. Failure to effectively pursue the sustainability of fisheries and the good health of the seas is a serious flaw in Mediterranean marine governance having also dire socio-economic implications, and the loss of species, even charismatic ones such as monk seals, is just one of the many consequences of this malaise. Therefore, while combating overfishing, illegal fishing and marine pollution remain actions of paramount importance in terms of monk seal conservation concerns, these should be implemented as part of each nation’s marine management and conservation policy rather than as part of a monk seal conservation strategy.

---

<sup>3</sup> A significant mortality factor in Greece and Turkey, although less relevant than deliberate killings in Greece, and mostly affecting juvenile seals (Veryeri et al. 2001, Karamanlidis et al. 2008).

### 2.3. Why a change of strategy is needed if monk seals are to be saved from extinction

As noted above, Mediterranean monk seals have been listed in IUCN's Red List as *Critically Endangered* since 1996, i.e. now for 17 years. This is at the same time bad news, because it is a testimony of our evident inability of keeping the species away from under the Damocles' sword of imminent extinction. However, it is also good news, because the species in fact is not extinct yet, particularly as far as the eastern Mediterranean individuals are concerned. One factor that could have slowed down the disappearance of monk seals where pupping nuclei still exist today involves the geography of the Aegean Sea, where thousands of remote, uninhabited islets becoming particularly impervious during the windy Aegean summers, offer appropriate habitat to the seals, as well as partial refuge from human encroachment and disturbance. Another potential factor, which however should be subject to detailed socio-economic investigation, concerns the evolving and possibly declining importance of artisanal fishing in many small island economies in favour of tourism development, which undeniably impacts less on monk seal survival.

Such considerations, however, cannot be taken as a reason for complacency. In spite of the species' dire conservation status, monk seal survival in the Mediterranean can still be secured, but success will demand hard work and uncompromising determination from the part of the concerned governments and civil societies.

Past initiatives to save Mediterranean monk seals have clearly been inadequate, in spite of the impressive list of international meetings dedicated to the cause. These include:

- 1972: 18-19 August. Guelph, Canada. IUCN working meeting of seal specialists on threatened and depleted seals of the world (Israëls 1999);
- 1974: 5 October. London. Monk seal meeting ((Israëls 1999);
- 1976: May. Rome. Meeting "The monk seal along the Italian coasts: problems and perspectives for its positive protection" (Israëls 1999);
- 1978: 2-5 May. Rhodes. First International Conference on the Mediterranean monk seal (Ronald & Duguy 1979);
- 1979: 11-13 October. Conference on the protection of Greek flora – fauna biotypes (Israëls 1999);
- 1984: 5-6 October. La Rochelle. Second International Conference on the Mediterranean Monk Seal (Ronald & Duguy 1984);
- 1985: 13-14 June. Port-Cros, France. "Séminaire International sur la stratégie de conservation du phoque moine" (Israëls 1999);
- 1986: 15-16 September. Strasbourg. First meeting of the monk seal Expert Group convened by the Council of Europe.
- 1986: 30 October. Bruxelles. Meeting of experts on the Mediterranean monk seal held under the auspices of the Directorate of the Environment, Consumer Protection and Nuclear Safety Commission of the European Communities.
- 1987: 2-6 November. Antalya, Turkey. Third International Conference on the Mediterranean monk seal.
- 1988: 11-12 January. Athens. Joint expert consultation on the conservation of the Mediterranean monk seal, organized by Barcelona Convention/UNEP-MAP in co-operation with IUCN (UNEP/MAP & IUCN 1988).
- 1988: 26 May. Port-Cros, France. Meeting of the International Scientific Committee on the monk seal (Israëls 1999);
- 1988: 30-31 May. Strasbourg. Second meeting of the monk seal Expert Group convened by the Council of Europe (Israëls 1999);
- 1989: 20-22 September. Madeira. Meeting of coordination of national and international programmes on the conservation of the Mediterranean monk seal. Organized by the Council of Europe in coordination with UNEP-MAP-RAC/SPA, IUCN, CMS, the Portuguese Government and the Regional Government of Madeira (Israëls 1999);



- 1990: 6 November. Bruxelles. Sixth Meeting of the monk seal Specialist Group (Israëls 1999);
- 1990: 10-11 December. Texel, The Netherlands. “Urgent action meeting for safeguarding the Mediterranean monk seal as a species” (Israëls 1999);
- 1991: 1-4 May. Antalya, Turkey. Seminar on the conservation of the Mediterranean monk seal (Council of Europe 1991);
- 1994: 7-9 October. Rabat, Morocco. Meeting of experts on the evaluation of the implementation of the Action plan for the management of Mediterranean monk seals (UNEP-MAP-RAC/SPA 1994);
- 1998: 19-20 January. Monaco. The World Marine Mammal Science Conference. Workshop on the biology and conservation of the world's endangered monk seals, Monaco, 19-20 January 1998. The Society for Marine Mammalogy & The European Cetacean Society;
- 1998: 29-31 October. Arta, Greece. Meeting of Experts on the Implementation of the Action Plans for Marine Mammals (monk seal and cetaceans) adopted within MAP (UNEP-MAP-RAC/SPA 1998);
- 2002: 29-30 September. Lattakia, Syria. Meeting of experts on the conservation of the Mediterranean monk seal: proposal of priority activities to be carried out in the Mediterranean Sea (UNEP-MAP-RAC/SPA 2003b);
- 2006: 17-19 September. Antalya, Turkey. International Conference on monk seal conservation (UNEP-MAP-RAC/SPA 2006a);
- 2008: 14 November. Monaco. First meeting of the Working Group: “Reintroduction of the monk seal to the Western Mediterranean”, organized by the Foundation Albert II, Prince of Monaco.
- 2009: 30 January. Monaco. Second meeting of the Working Group: “Reintroduction of the monk seal to the Western Mediterranean”, organized by the Foundation Albert II, Prince of Monaco.
- 2009: 28 February. Istanbul. “Who are our seals? Moving towards a standardized population estimate approach for *Monachus monachus*”. Workshop conducted within the framework of the European Cetacean Society Annual Conference, sponsored by the RAC/SPA and the Principality of Monaco (UNEP-MAP-RAC/SPA 2009);
- 2009: 30 March – 3 April. Maui, Hawai'i. First International Conference on Marine Mammal Protected Areas. Workshop on MMPAs and MMPA networks for monk seal conservation (Reeves 2009);
- 2010: 10 June. Monaco. Third meeting of the Working Group: “Reintroduction of the monk seal to the Western Mediterranean”, organized by the Foundation Albert II, Prince of Monaco.
- 2011: 9 November. Martinique, French Antilles. Second International Conference on Marine Mammal Protected Areas. Workshop on the conservation of monk seals (Hoyt 2012).

Many of the meetings listed above have produced declarations and action plans. All the recommendations that could be possibly excogitated have already been recommended. Many resolutions and recommendations concerning monk seal conservation have also been adopted in meetings not strictly dedicated to the species' survival (e.g., UNEP-MAP-RAC/SPA 2005a, UNEP-MAP-RAC/SPA 2009, IUCN 2009, GFCM 2011). Furthermore, in addition to international initiatives, monk seal conservation action plans and strategies have also been drafted and adopted at the national level, sometimes under the impetus of proposals from NGOs. Examples of such documents exist, amongst others, in Algeria (UNEP-MAP-RAC/SPA 2006b), Cyprus (UNEP-MAP-RAC/SPA 2011 b), Egypt (Notarbartolo di Sciara & Fouad 2011), Greece (Anon. 1996, superseded by Notarbartolo di Sciara et al. 2009a; Anon. 2009), and Turkey (Kıraç et al. 2011).

Unfortunately such declarations, action plans, resolutions and recommendations, year after year, are now collecting dust without the surviving monk seals being able to take much notice. Until there is a clear and unequivocal understanding of why meeting and resolutions do not produce intended action, and why conservation actions to counteract monk seal decline in the Mediterranean have consistently failed, there is little hope that things will change for the better.

Certainly, the old pretext of “not knowing enough” about the species’ ecology no longer stands. Ecological and veterinary knowledge, although incomplete, is substantive and helpful. Threats are well identified, and the measures to address them straightforward. Not even regulatory insufficiency can be blamed, given that legal provisions at all possible levels (national, regional, European and international) could not be more adequate.

Three main reasons are envisaged below to explain such resounding failure in securing monk seal survival in the Mediterranean.

First, the difficulties encountered by many governments in implementing their commitments in terms of conservation and sustainable use of marine resources certainly remain at the forefront. Saying “sustainable” is easy, but bearing the short-term socio-economic and political costs that true sustainability involves is far more difficult, and therefore rarely done. This includes even simple and straight-forward actions such as enforcing the prohibition of carrying guns and/or dynamite aboard fishing vessels; such enforcement could certainly carry highly beneficial effects to monk seal conservation.

Second, efforts of conserving the Mediterranean monk seal, a natural asset which is uniquely shared by all the region’s riparian states, have sorely lacked in coordination and continuity. Too many action plans have been produced that have remained on paper instead of becoming the backbone of a concerted effort, seeing the active involvement and cooperation of all the components of Mediterranean civil society at large, public and private, national and international. Funds for monk seal conservation have been allocated piecemeal instead of being invested to support a science-based, long-term, region-wide strategy. Although the greatest achievements in monk seal conservation in the Mediterranean during the past few decades were secured thanks to the laudable commitment of a handful of NGOs, in the end the lack of institutional interest, leadership and support from within the most concerned nations has resulted in the erosion of civil society’s goodwill, and occasionally stimulated squabbling instead of constructive cooperation towards a shared goal. Quite regrettably, the commendable prescriptions by the Barcelona Convention Action Plan (UNEP/MAP/RAC/SPA 2003a), that: a) an expert be employed with the specific task of facilitating such coordination (Art. 30); and b) the status of monk seals be reviewed every two years, with a report submitted to the Contracting Parties of the Barcelona Convention for endorsement (Art. 31), were never implemented as stated. The need for coordination is particularly acute in an arena which sees so many players, as well as many major international bodies, taking interest in such highly mobile animals as monk seals, which are rarely confined to waters within the jurisdiction of any single nation. Monk seals offer an exemplary case in which conservation needs cooperation amongst range states and concerned international bodies, which include, in addition to the Barcelona Convention, the Convention on Migratory Species (which lists Mediterranean monk seals in its Appendix I), the General Fisheries Commission for the Mediterranean (e.g., GFCM 2011), the Bern Convention (Mediterranean monk seals listed in Appendix II), and the European Union (which lists Mediterranean monk seals as *priority species*<sup>4</sup> in Annex II of Council Directive 92/43/EEC, known as the “Habitats Directive”). Barcelona Convention/UNEP-MAP has the mandate of fulfilling in the best possible way the coordinating functions required by such a complex and challenging region-

---

<sup>4</sup> “Species of Community interest which is endangered, for the conservation of which the Community has particular responsibility in view of the proportion of its natural range which falls within the European territory.”

wide conservation strategy through its various regional bodies, and most notably the RAC/SPA.

Third, until now the overwhelming emphasis of monk seal conservation actions has been on the species rather than on the human beings who interact with it. However, the root of monk seal conservation has a social rather than an ecological nature, because problems to the species derive from its devastating interactions with people rather than from its intrinsic natural characteristics. Early players in the monk seal conservation arena - naturalists, biologist, ecologists and veterinarians – now urgently need to team up with social scientists, economists, as well as legal, media and education experts if actions are to become more incisive where the problems are most acute. Even merely advocating greater stakeholder participation may no longer be sufficient to achieve appreciable results. The solution of monk seal conservation problems must be perceived as residing in, and fully coinciding with, the solution of the wider environmental and socio-economic problems of the involved human communities. It is only from within such communities that the solution to monk seal conservation problems can originate.

#### **2.4. Monk seal functions and values in the Mediterranean**

Faced with the perspective of investing the considerable amount of time, effort and resources needed to reverse the critical conservation status of monk seals in the Mediterranean, many could find it legitimate to question the ethical aspects of dedicating to a single species far greater attention than to most of the region's other marine organisms.

The reply to such question is that dedicating to monk seal conservation extraordinary attention and resources is indeed legitimate, for many reasons.

The first reason is legal: *Monachus monachus*, as mentioned previously, is protected by numerous national, regional, and international legislation, and failing to do so is against the law.

Second, the Mediterranean monk seal is a species that possesses intrinsic values under many aspects, such as: a) non-consumptive use value (e.g., as an apex predator in the maintenance of ecological balance; as a potential ally in combating the diffusion of noxious alien fish species; as a resource for ecotourism); b) option value (i.e., “a means of assigning a value to risk aversion in the face of uncertainty”, McNeely 1988); and c) clearly perceived existence value (e.g., Langford et al. 2001).

Third, protecting monk seals is important not only because of their intrinsic values, but also because conservation actions favoring monk seals are likely to extend their benefits to other species and to the environment they are part of, given the monk seals' qualities of both umbrella and flagship species (Leader-Williams & Dublin 2000).

Finally, witnessing impotently the extinction in the Mediterranean of charismatic monk seals also carries political significance, because such extinction would create a devastating loss of institutional credibility. This is why a forceful monk seal conservation strategy, embraced regionally as a best practice example, should become solidly integrated within a wider strategy for the conservation of the Mediterranean marine environment.

Ultimately, the effort to conserve the marine environment and its biodiversity - and in particular monk seals that can be so easily identified as symbols of such effort - must be driven by values (Wilhere et al. 2012). While conserving monk seals and their habitat in the Mediterranean is an obligation that the region's nations have explicitly committed to, on the basis of a large number of national, regional, international and, where appropriate, European

legal instruments, the species' future will be secured only if a) the region's civil society will attribute to the seals the value they deserve, and b) saving monk seals from extinction will be seen as the epitome of the effort of reversing the devastating trend of loss of naturalness which is plaguing the Mediterranean.

Ideally, monk seals should become the symbol of a renewed effort towards Mediterranean marine conservation. Therein lies the importance of implementing an effective and successful strategy for the conservation of this species.

### 3. A region-wide Strategy for the Conservation of Monk Seals in the Mediterranean

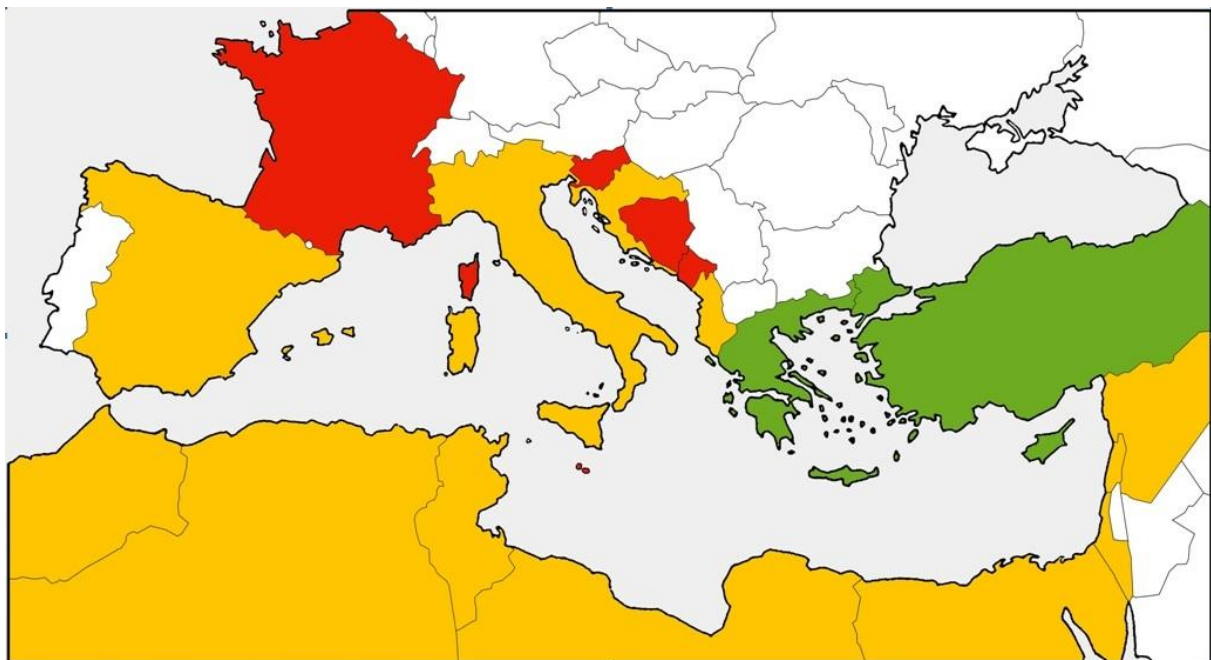
#### 3.1. Rationale for the Strategy

The Strategy presented below (Section 3.2) differs from the Barcelona Convention's "Action plan for the management of the Mediterranean monk seal (*Monachus monachus*)" (UNEP-MAP-RAC/SPA 2003a) chiefly in terms of its method, considering that the old Action Plan continues to be valid as far as its contents and general principles are concerned<sup>5</sup>.

In structuring the Strategy, guidelines were followed which are detailed in the manual for the construction of Species Conservation Strategies (IUCN/SSC 2008). Accordingly, this Strategy is structured as follows:

- a. a Vision, with associated Goals and Goal Targets that are SMART<sup>6</sup>;
- b. the Objectives needed to achieve the Goal Targets within the stated time span, with associated SMART Objective Targets.

The definition of Actions to attain Objective Targets, i.e., the activities which need to be performed in order to achieve the Objectives, Goals, and ultimately the Vision, will be amongst the first tasks of the Monk Seal Task Force, as soon as it will start functioning.



**Figure 1.** Monk seal conservation status by country in 2011. Green: "Group A" countries. Yellow: "Group B" countries. Red: "Group C" countries

<sup>5</sup> With few exceptions; e.g., concerning knowledge of the species, which is no longer as poor as it was in 1988 (Art. 3), and the fact that scientific opinion is no longer divided concerning conservation strategies (Art. 4).

<sup>6</sup> Specific, Measurable, Achievable, Relevant, Time-bound.

The main problem encountered in envisaging a region-wide Strategy derives from the quite diverse conservation status of monk seals in the different portion of the Mediterranean, as clearly evident from the Section 2.2 in this document, and by consequence the quite different priorities and responsibilities saddled onto the various monk seal Range States.

To handle this challenge, it is here proposed to assign Mediterranean countries to three groups (Figure 1 and Table 1):

- A. Countries where monk seal breeding has been reported after year 2000<sup>7</sup>;
- B. Countries with evidence of monk seal presence, but with no breeding reported after year 2000;
- C. Countries where no monk seals have been reported since year 2000.

Group A countries is where action is most urgent, because at the moment these countries are our best hope for the survival of the species. Group B countries are also important, because they contain monk seal critical habitat which is likely to be re-colonised if conditions are favourable (as demonstrated by the frequent appearances of monk seals in many locations), particularly if actions in Group A countries are successful. Group C countries are also important because they contain monk seal critical habitat, and because the return of monk seals will become more likely if actions in Group B countries are successful.

To fulfil the Vision, this Strategy identifies four Goals. The first Goal relates to the creation of a conservation support structure at the international level, whereas the other three Goals relate to each of the three Groups the various countries have been assigned to.

Section 3.2 was drafted in a way to allow it to be eventually excerpted from this document and submitted for adoption as a separate document.

---

<sup>7</sup> Year 2000 was arbitrarily selected as a criterion to separate present from past.

Country	Group A: Monk seals present, breeding occurring (reported after year 2000)	Group B: evidence of monk seal presence, but no breeding reported after year 2000	Group C: no monk seals reported since year 2000	References	Notes
Spain				Anon. 2008, Font & Mayol 2009	Individual sighted in 2008 Isla del Toro, Mallorca. More sightings in 2009.
France				UNEP-MAP-RAC/SPA 1994	No recent reports.
Monaco					No recent reports. Monk seal habitat no longer present.
Italy				Mo 2011	
Slovenia				UNEP-MAP-RAC/SPA 2003b	No recent reports.
Croatia				Antolovic et al. 2007, Gomercic et al. 2011	
Bosnia Herzegovina					No recent reports.
Montenegro					No recent reports.
Albania				UNEP-MAP-RAC/SPA 2003b, UNEP-MAP-RAC/SPA 2005c, Anon. 2012	
Greece				Notarbartolo di Sciara et al. 2009b, Panou 2009	
Turkey				Güçlüsoy et al. 2004, Gucu et al. 2009b	
Cyprus				Gucu et al. 2009a  UNEP/MAP/RAC/SPA 2011b	Young of the year observed in 2006-7.  Evidence of a newborn pup found dead in 2009.
Syria				Gucu 2004, Jony & Ibrahim 2006, Mo et al. 2003	
Lebanon				Anon. 2010	
Israel				Scheinin et al. 2011	
Egypt				Notarbartolo di Sciara & Fouad 2011	
Libya				Sergeant et al. 1979, Hamza et al. 2003, RAC/SPA 2012	
Malta				UNEP-MAP-RAC/SPA 2003b	No recent reports.
Tunisia				UNEP-MAP-RAC/SPA 2001 UNEP-MAP-RAC/SPA 2003b	
Algeria				UNEP-MAP-RAC/SPA 2006b	The seal pup reported in 2006 was not <i>M. monachus</i> (Bouderbala et al. 2007)
Morocco				UNEP-MAP-RAC/SPA 2003b, Mo et al. 2011	

**Table 1.** Summary of monk seal presence in the different Mediterranean countries (listed clockwise from the west).

## 3.2. The Strategy

### 3.2.1. Vision

“Over the next two decades, the ecological recovery of monk seals in the Mediterranean will deem to have occurred, when multiple colonies have become established within all major habitats of their historic range, interacting in ecologically significant ways with the fullest possible set of other species, and inspiring and connecting human cultures”.

### 3.2.2. Goals

**Goal 1.** Mediterranean Range States implement this Strategy in pursuance of the Vision, through the expeditious development and adoption of appropriate national policies and administrative frameworks, and with the effective, coordinated support from relevant international organizations and civil society.

**Goal 2.** Monk seal breeding nuclei in sites located in “Group A” countries are effectively protected from deliberate killings and habitat degradation, so that seal numbers in such sites increase and seals are able to disperse to and re-colonize the surrounding areas.

**Goal 3.** Monk seal presence in sites where they are occasionally seen today in “Group B” countries is permanently established, and breeding resumes. “Group B” countries are upgraded to “Group A”.

**Goal 4.** Monk seal presence is again reported in the species’ historical habitat in “Group C” countries, and these “Group C” countries are upgraded to “Group B”. Once all “Group C” countries are upgraded, Group C is deleted.

### 3.2.3. Goal Targets, Objectives and Objective Targets

**Goal 1. Mediterranean Range States implement this Strategy in pursuance of the Vision, through the expeditious development and adoption of appropriate national policies and administrative frameworks, and with the effective, coordinated support from relevant international organizations and civil society.**

**Goal Target 1.1.** A framework for the implementation of the Mediterranean Monk Seal Conservation Strategy is established by the Mediterranean Range States. The framework will include the establishment of a Monk Seal Task Force (MSTF) and the selection of a Monk Seal Conservation Officer (MSCO).

**Objective 1.1.1.** Mediterranean Range States establish a **Monk Seal Task Force (MSTF)** tasked to recommend actions a) for the implementation of the Strategy, and b) to update, adapt and improve the Strategy itself (e.g., by defining the Actions needed to attain the different Objective Targets). The MSTF is composed by a small (ideally,  $\leq 10$ ) group of monk seal conservation experts, whom the Range States designate, selected amongst national and international monk seal conservation experts. The MSTF will include ecological as well as social and economical expertise. The MSTF functioning is supported by the RAC/SPA, and may benefit from the technical support of IUCN’s Pinniped Specialist Group, the GFCM and other relevant international organizations.

**Objective Target 1.1.1.1.** MSTF TOR adopted, Task Force established by March 2014. The Task Force meets at least once a year to review the status of monk seals in the region, and to support the implementation of the appropriate Actions foreseen in the Strategy.

**Objective Target 1.1.1.2.** First meeting of MSTF in June 2014. Recommendations adopted are submitted to Contracting Parties to the Barcelona Convention through the SPA Focal Points<sup>8</sup>.

**Objective Target 1.1.1.3.** MSTF activities are harmonized with efforts by the Barcelona Convention/UNEP-MAP within the Ecosystem Approach process for the attainment of Good Environmental Status in the Mediterranean, i.e., to attain Ecological Objective EO1 “Biodiversity” and Operational Objectives 1.1 (“Species distribution is maintained”), 1.2 (“Population size of selected species is maintained”), 1.3 (“Population condition of selected species is maintained”), 1.4 (“Key coastal and marine habitats are not being lost”), as far as monk seals are concerned.

**Objective 1.1.2.** A **Monk Seal Conservation Officer (MSCO)** is selected by the Range States from within the MSTF, tasked of coordinating the MSTF work and of supporting the conservation activities implemented by Range States and concerned international organizations through the implementation of this Strategy<sup>9</sup>.

**Objective Target 1.1.2.1.** TOR for MSCO adopted, MSCO engaged by March 2014.

**Objective 1.1.3.** The Parties to the Barcelona Convention ensure that the MSTF and the activities it recommends are supported by adequate resources.

**Objective Target 1.1.3.1.** The Parties to the Barcelona Convention adopt a resolution to support the MSTF functioning.

**Objective 1.1.4.** The Parties to the Barcelona Convention ensure that the activities that the MSTF recommends, insofar as it is possible, are implemented.

**Objective Target 1.1.4.1.** The Parties to the Barcelona Convention adopt resolutions in support of specific MSTF recommendations concerning the implementation of this Strategy.

**Goal Target 1.2.** Based on this Strategy, the MSTF provides support to Mediterranean Range States in the development and implementation of specific conservation actions having a regional scope.

**Objective 1.2.1.** A contingency plan for single disastrous events (e.g., a lethal epizootic outbreak, a massive oil spill within monk seal critical habitat), and for emergency conditions which may derive from catastrophic environmental change, is developed by the MSTF in cooperation with equivalent bodies dealing with the conservation of Mediterranean monk seals in the Atlantic, with the conservation of cetaceans in the Mediterranean (i.e., within the ACCOBAMS framework), and with the appropriate bodies within the “Barcelona System” (e.g., REMPEC). The contingency plan will include the collection and safe storage of Mediterranean monk seal germplasm which may support in the future the recovery of the species should it become extinct.

<sup>8</sup> As prescribed in Art. 31 of the Action Plan (UNEP-MAP-RAC/SPA, 2003a).

<sup>9</sup> As prescribed in Art. 30 of the Action Plan (UNEP-MAP-RAC/SPA, 2003a).



**Objective Target 1.2.1.1.** Contingency plan developed by the MSTF in 2014, and adopted by the subsequent Barcelona Convention CoP.

**Objective 1.2.2.** Capacity building and awareness activities are planned by the MSTF, and promoted in monk seal Ranges States so that monk seal protection and recovery is effectively embraced at the national level. This will include the preparation of a dedicated web site and the regular issuing and widely distributed monk seal information newsletter in an adequate number of different languages.

**Objective Target 1.2.2.1.** Capacity building: the main groups of stakeholders in monk seal conservation are identified by the MSTF, tailored to each different monk seal Range State (with first priority given to “Group A Countries” and second priority given to “Group B Countries”), and training courses are prepared and planned (see Goal Targets 2.2. and 3.8). Preferably, training events will be developed *in situ* at selected locations having special relevance to monk seal conservation, in collaboration with the local groups, and will be followed by a constant “advice service” or accompanying process to ensure that full and long-lasting advantage derives from the effort.

**Objective Target 1.2.2.2.** In order to facilitate collaboration and communication amongst monk seal conservation experts throughout the region, the MSTF promotes periodical workshops on best practices of monk seal monitoring and conservation techniques, preferably taking advantage of other meetings being periodically organized (e.g., CIESM Congresses, ECS Annual meetings). Proceedings are edited and widely diffused (e.g., by pdf through the Internet) in formats that will serve as “best practice guidelines”.

**Objective Target 1.2.2.3.** Awareness actions are promoted by the MSTF, with first priority given to “Group A Countries” (with the exception of Greece) and second priority given to “Group B Countries”, in cooperation with local groups, targeting special-interest stakeholders such as fishermen and local coastal communities. Awareness actions, preferably supported through national fundraising efforts, could be modeled (*mutatis mutandis*) on the experience of the EC-funded “Thalassa” LIFE+ Information Communication project carried out in Greece in 2010-2013.

**Objective Target 1.2.2.4.** A website dedicated to monk seal conservation and information at the regional level is prepared by RAC/SPA in close collaboration with “The Monachus Guardian” and posted online by the end of 2014.

**Objective Target 1.2.2.5.** Monk seal newsletter issued twice a year by RAC/SPA in close collaboration with “The Monachus Guardian”, starting in 2014.

**Objective 1.2.3.** Monk seal rescue and rehabilitation programmes are planned by the MSTF and supported in Range States (with priority given to “Group A” countries) through capacity building and structural and operational funding.

**Objective Target 1.2.3.1.** The “National Rescue and Information Network” (RINT) in Greece is supported and strengthened. The construction and operation of a state-of-the-art rehabilitation facility (operational by 2015) is supported.

**Objective Target 1.2.3.2.** The national rescue and rehabilitation network called AFBKA, to be enhanced and further supported in Turkey, is operational by August 2014. Capacity building programmes with international expert support facilitated by the MSTF are implemented in 2015.

**Objective Target 1.2.3.3.** A national rescue and rehabilitation network is established and supported in Cyprus. Capacity building programmes with international expert support facilitated by the MSTF are implemented in 2015. Arrangements are made for a) the local rescue and release of seals in need of minor support, and b) the transfer of seals needing major support to the rehabilitation facility in Greece or in Turkey.

**Objective 1.2.4.** Monitoring of monk seal distribution and abundance, as well as advances in knowledge important for monk seal conservation, are promoted and supported by the MSTF through training, workshops and the facilitation of research and monitoring programmes. The monitoring process is made to coincide with the similar monitoring requirements within the framework of the Ecosystem Approach process by Barcelona Convention/UNEP-MAP, and (where appropriate) with the Marine Framework Strategy Directive of the EC.

**Objective Target 1.2.4.1.** MSTF supports the completion of monk seal breeding site inventories in “Group A Countries” by 2016.

**Objective Target 1.2.4.2.** MSTF supports the yearly monitoring of monk seal population parameters (e.g., pup production) in breeding sites in “Group A Countries”, starting in 2014.

**Objective Target 1.2.4.3.** MSTF supports the regular monitoring of region-wide monk seal demographic parameters, such as mortality (levels and causes) and birth rates, starting in 2014.

**Goal 2. Monk seal breeding nuclei in sites located in “Group A” countries are effectively protected from deliberate killings and habitat degradation, so that seal numbers in such sites increase and seals are able to disperse to and re-colonize the surrounding areas.**

**Goal Target 2.1.** Maintain and secure monk seal presence in important monk seal locations, including: a) Greek Ionian islands (Lefkada, Kefallinia, Ithaca, Zakynthos, and surrounding islets and seas); b) Northern Sporades; c) Gyaros; d) Kimolos and Polyaiagos; e) Karpathos-Saria; f) Turkish Aegean and Mediterranean coasts; g) Cyprus. Breeding nuclei in the locations listed above are effectively protected from deliberate killings and habitat degradation, so that seal numbers in such sites increase and young seals are able to disperse and re-colonize the surrounding areas.

**Objective 2.1.1.** Current legislation prohibiting to carry firearms and explosives aboard fishing vessels in Greece, Turkey, Cyprus is enforced, with a special attention in locations listed in Goal Target 2.1.

**Objective Target 2.1.1.1.** Compliance with existing laws concerning firearms and explosives aboard fishing vessels in Greece, Turkey, Cyprus is routinely enforced everywhere, to come into effect with immediate urgency. Appropriate statistics of infringements are kept and publicized. Infringements are prosecuted with penalties appropriate to address the destruction of a critically endangered, specially protected species. Current illegal fishing practices are eradicated.

**Objective 2.1.2.** Locations listed in Goal Target 2.1, and other equally important locations that may be eventually discovered in the future, are geographically delimited and legally protected/managed.

**Objective Target 2.1.2.1.** A monk seal MPA (or an MPA network) encompassing the most important monk seal habitat in the area is formally established in the Greek Ionian islands by 2014.

**Objective Target 2.1.2.2.** The current Natura 2000 site around the island of Gyaros is formally established as a monk seal protected area by 2014.

**Objective Target 2.1.2.3.** A monk seal MPA is formally established in Kimolos - Polyaigos by 2013.

**Objective Target 2.1.2.4.** A monk seal MPA is formally established in Karpathos - Saria by 2013<sup>10</sup>.

**Objective Target 2.1.2.5.** Monk seal MPAs are designated along the Aegean and Mediterranean coastline of Turkey by 2014, to protect monk seal critical habitat as determined and mapped by the Turkish National Monk Seal Committee.

**Objective Target 2.1.2.6.** A monk seal MPA is designated in Cyprus where suitable critical monk seal critical habitat is identified, and established by 2015.

**Objective 2.1.3.** Areas in locations listed under Goal Target 2.1 are effectively protected through a) appropriate management actions, and b) the keen involvement of the local communities, which will both ensure the good conservation status of monk seals found there. A management framework is in place and implemented, defining the spatial, temporal and specific measures needed in the species' critical habitats (e.g., regulating access to caves), thereby affording effective protection to haul out and pupping sites.

**Objective Target 2.1.3.1.** Until formal protection of the areas listed under Goal Target 2.1 is established and enforced, patrolling of the most important haul out and pupping locations and caves is organized at least during the summer and breeding season, starting in 2014. Patrolling can be done by volunteers, well-trained and possibly local, who will be performing awareness actions *in situ*, as well as solicit the intervention of law enforcers in case of need.

**Objective Target 2.1.3.2.** All monk seal MPAs established under Objective 2.1.2, as well as the National Marine Park of Alonissos – Northern Sporades, are endowed with an operant Management Body and a management plan which is adaptive, ecosystem-based and fully implemented by 2014.

**Objective Target 2.1.3.3.** Management in monk seal MPAs established under Objective 2.1.2, as well as the National Marine Park of Alonissos – Northern Sporades, is conducted in a participatory fashion, with the full involvement of local artisanal fishermen and local communities at large, and in cooperation with the fisheries sectors (e.g., see GFCM 2011). All proposals and decisions aiming at establishing or modifying conservation and protection measures must be based on sound and indisputable scientific data and evidence. Elements of participatory approach will include awareness campaigns as well as the experimentation/adoption of innovative mechanisms to address opportunity costs, damage mitigation and the generation of alternative sources of income (e.g., ecotourism).

---

<sup>10</sup> Greece has already established the protected area Management Body in Karpathos in 2007, however the MPA has not been legally declared yet.

**Goal Target 2.2.** Implementation of Goal Target 2.1. is enabled through appropriate capacity building activities.

**Objective 2.2.1.** Training sessions are organized in areas relevant to locations listed in Goal Target 2.1, with the support of the MSTF (see Objective Target 1.2.2.1). Training will concentrate, at least initially, on mitigating the main threats to monk seals (deliberate killing, habitat degradation, and accidental entanglement), and will target stakeholders identified by the MSTF (e.g., fishermen, tourist operators, enforcement officers, judges). Training will be developed together with the local groups, and will be followed by a constant “advice service” or accompanying process to ensure that full advantage is taken from the effort.

**Goal 3. Monk seal presence in sites where they are occasionally seen today in “Group B” countries is permanently established, and breeding resumes. “Group B” countries are upgraded to “Group A”.**

Monk seal presence in “Group B” countries must be verified with appropriate methods so as to define the actual species’ use of the coastal seas and identify the areas in which priority monitoring, awareness and protection actions need to be carried out (see Objective 1.2.4). This implies that priority areas of usage be identified thorough sighting collection campaigns, habitat surveys in areas of hotspot sightings, and where the coastal habitat is most pristine (which implies analysis of coastal habitat characteristics and their distribution in each nation), followed by in situ monitoring to assess the eventual degree of habitat use by monk seals. Sites with repeated use and with highest numbers of monk seal sightings must be evaluated in terms of pressures and risks. Awareness activities to be carried out in each site will depend on the type of use of the coasts by the species, the degree of the pressures impinging on each site, and the type of risks involved depending on what will appear to be the type of habitat use by the monk seals.

**Goal Target 3.1.** Monk seal presence in Italy, and in particular in the Egadi Islands, in locations around Sardinia, and in the Tuscan Archipelago, is permanently established, and monk seal breeding resumes.

**Objective 3.1.1.** Monitoring of monk seal distribution, abundance and behavior (including eventual pup production) is continued in the Egadi islands.

**Objective Target 3.1.1.1.** Non-invasive and scientifically sound monitoring technologies, applied to caves in appropriate locations within the Egadi Islands MPA, is continued and enhanced.

**Objective Target 3.1.1.2.** A programme involving local fishermen in the monitoring programme around the Egadi Islands MPA (also targeted at increasing their awareness), is continued and enhanced.

**Objective 3.1.2.** Regular monitoring of monk seal presence and awareness actions are conducted in areas historically containing monk seal habitat in Sardinia.

**Objective 3.1.3.** Regular monitoring of monk seal presence and awareness actions are conducted in areas historically containing monk seal habitat in the Tuscan Archipelago.

**Goal Target 3.2.** Monk seal presence in Croatia, and in particular in specific localities of the Dalmatian archipelago and southern Istria, is permanently established, and monk seal breeding resumes.

**Objective 3.2.1.** Monk seal ecology and behavior (including eventual pup production) is monitored in selected locations of the Dalmatian Archipelago and of the Istria Peninsula, and awareness action is conducted in the area.

**Objective Target 3.2.1.1.** Non-invasive and scientifically sound monitoring technologies are applied to caves in Istria and selected Dalmatian islands, starting in 2014.

**Objective Target 3.2.1.2.** Awareness actions are conducted in Croatia, targeting local residents and visitors.

**Goal Target 3.3.** Monk seal presence in Libya and nearby western Egypt is confirmed and permanently established, and monk seal breeding is reported.

**Objective 3.3.1.** Monk seal ecology and behavior (including eventual pup production) is monitored in Libya (Cyrenaica) and nearby Egyptian coast (from the border, including Sallum MPA, to Marsa Matrouh).

**Objective Target 3.3.1.1.** Full survey of monk seal presence and awareness actions organized in Cyrenaica by 2015.

**Objective Target 3.3.1.2.** Full survey of monk seal presence and awareness actions organized in Egypt (from the border, including Sallum MPA, to Marsa Matrouh) by 2015.

**Goal Target 3.4.** Monk seal presence in the Balearic Islands, Spain, is confirmed and permanently established.

**Objective 3.4.1.** A reporting scheme to detect occasional monk seal presence and alert authorities is implemented; awareness actions are conducted around the Balearic Islands, Spain.

**Goal Target 3.5.** Monk seal presence in Albania is confirmed and permanently established.

**Objective 3.5.1.** A reporting scheme to detect occasional monk seal presence and alert authorities is implemented along the Albanian coastal zone; awareness actions are conducted in the concerned areas.

**Goal Target 3.6.** Monk seal presence in Syria, Lebanon and Israel is confirmed and permanently established.

**Objective 3.6.1.** A reporting scheme to detect occasional monk seal presence and alert authorities is implemented along the Syrian, Lebanese and Israeli coastal zone; awareness actions are conducted in the concerned areas.

**Goal Target 3.7.** Monk seal continued presence in locations of the Maghreb's Mediterranean coasts and annexed islands, in Tunisia, Algeria, Morocco, and the Chafarinas Islands (Spain) is confirmed and permanently established.

**Objective 3.7.1.** A reporting scheme to detect occasional monk seal presence and alert authorities is implemented along Maghreb's Mediterranean coasts and annexed islands, in Tunisia, Algeria, Morocco, and the Chafarinas Islands (Spain); awareness actions are conducted in the concerned areas.

**Goal Target 3.8.** Implementation of Goal Targets 3.1.-3.7. is enabled through appropriate capacity building activities.

**Objective 3.8.1.** Capacity building. Training sessions are organized in areas relevant to locations listed in Goal Target 3.1-3.7, with the support of the MSTF (see Objective Target 1.2.2.1). Training will concentrate, at least initially, on mitigating the main threats to monk seals (deliberate killing, habitat degradation, and accidental entanglements), and will target stakeholders identified by the MSTF (e.g., fishermen, tourist operators, enforcement officers, judges). Training will be developed together with the local groups, and will be followed by a constant "advice service" or accompanying process to ensure that full advantage is taken from the effort.

**Goal 4. Monk seal presence is again reported in the species' historical habitat in "Group C" countries, and these "Group C" countries are upgraded to "Group B". Once all "Group C" countries are upgraded, Group C is deleted.**

**Goal Target 4.1.** Monk seal presence is reported again from Corsica and continental France.

**Objective 4.1.1.** Regular monitoring of monk seal presence and awareness actions are conducted in the species' historical habitat in Corsica and continental France.

**Goal Target 4.2.** Monk seal presence is reported from Montenegro, Bosnia Herzegovina and Slovenia.

**Objective 4.2.1.** Regular monitoring of monk seal presence and awareness actions are conducted in the species' historical habitat in Montenegro, Bosnia Herzegovina and Slovenia.

**Goal Target 4.3.** Monk seal presence is reported from Malta.

**Objective 4.3.1.** Regular monitoring of monk seal presence and awareness actions are conducted in the species' historical habitat in Malta.

**Goal Target 4.4.** Implementation of Goal Targets 4.1-4.3. is enabled through appropriate capacity building activities.

**Objective 4.4.1.** Capacity building: training courses are organised in locations listed in Goal Targets 4.1-4.3, with the support of the Monk Seal Task Force (see Objective Target 1.2.2.1).

#### **3.2.4. Revision of the Strategy**

The suggested time horizon of this Strategy is six years, to be concluded in 2018-2019, when a comprehensive review of the Strategy's accomplishments and failures, with a consideration for potential actions to be taken beyond 2019, should be conducted. Such timing also coincides with the process requiring EU Member States to report concerning the Habitats and Marine Strategy Framework Directives, thereby facilitating the implementation of the Strategy's actions by such States.

A mid-term assessment of the implementation results in 2016 is also recommended, to evaluate up-to-date attainment of Goals and Objectives within the Strategy's timeframe and to identify, if needed, moderate adjustments.

#### **4. Acknowledgments**

The author wishes to express his appreciation to the many colleagues who have improved the draft of this document with comments and advice: Abdellatif Bayed, Université Mohammed V, Rabat, Morocco; Panagiotis Dendrinis, Alexandros Karamanlidis and Vangelis Paravas, MOm, Greece; Pablo Fernandez de Larrinoa, Fundaciòn CBD-Habitat, Spain; Manel Gazo, Submon, Spain; Ali Cemal Gucu, Middle East Technical University, Turkey; William Johnson, The Monachus Guardian, Switzerland; Giulia Mo, ISPRA, Italy; Bayram Öztürk, Istanbul University, Turkey. Thanks are also due to Lobna Ben Nakhla, RAC/SPA, for her continued assistance during the drafting of the document.



## 5. List of references

- Anonymous. 1996. Strategy for the protection of the Mediterranean monk seal *Monachus monachus* in Greece. Archipelagos - marine and coastal management, and MOm / Hellenic Society for the Study and Protection of the Monk Seal. Athens. 10 p.
- Anonymous. 2004. Mediterranean News: Morocco. The Monachus Guardian 7(2).
- Anonymous. 2008. Mediterranean News: Spain. Seal returns after 50-year absence. The Monachus Guardian 11(2).
- Anonymous. 2009. Action plan for the mitigation of the negative effects of monk seal - fisheries interactions in Greece. Summary report in English. MOm, WWF Greece, Fisheries Research Institute. Publication prepared as part of the LIFE- Nature Project: "MOFI: Monk Seal and Fisheries: Mitigating the conflict in Greek Seas" (LIFE05NAT/GR/000083). 11 p.
- Anonymous. 2010. Mediterranean News: Lebanon. Seal sightings in Lebanon. The Monachus Guardian 13(2).
- Anonymous. 2012. <http://www.monachus-guardian.org/wordpress/2012/08/23/monk-seal-sighting-in-albania/>
- Aguilar A., Lowry L. 2008. *Monachus monachus*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>
- Alfaghi I.A., Abed A.S., Dendrinou P., Psaradellis M., Karamanlidis A.A. 2013. First confirmed sighting of the Mediterranean monk seal (*Monachus monachus*) in Libya since 1972. Aquatic Mammals 39(1):81-84. DOI 10.1578/AM.39.1.2013.81
- Androukaki E., Adamantopoulou S., Dendrinou P., Tounta E., Kotomatas S. 1999. Causes of mortality in the Mediterranean monk seal (*Monachus monachus*) in Greece. Contributions to the Zoogeography and Ecology of the Eastern Mediterranean Region 1:405-411.
- Antolovic J., Antolovic M., Antolovic N., Furlan B., Adamic-Antolovic Lj., Antolovic R., Cok I. 2007. Monk sea (*Monachus monachus*) sightings in the Croatian part of the Adriatic with a special reference to the population of open-sea islands. The Monachus Guardian 10(1).
- Avella F.J., Gonzalez L.M. 1984. Monk seal (*Monachus monachus*): a survey along the Mediterranean coast of Morocco. Pp: 60-78 in: K. Ronald and R. Duguay (editors). Les phoques moines - Monk seals. Proceedings of the Second International Conference, La Rochelle, France, 5 - 6 October 1984. Annales de la Société des Sciences Naturelles de la Charente-Maritime, Supplément, décembre 1984. 120 p.
- Berkes F., Anat H., Kislalioglu M., Esenel M. 1979. Distribution and ecology of *Monachus monachus* on Turkish coasts. Pp. 113-128 in: K. Ronald, R. Duguay (editors), The Mediterranean monk seal. Proceedings of the First International Conference, Rhodes, Greece, 2-5 May 1978. UNEP Technical Series, Volume 1. Pergamon Press, Oxford. 183 p.
- Bouderbala M., Bouras D., Bekrattou D., Doukara K., Abdelghani M.F., Boutiba Z. 2007. First recorded instance of a hooded seal (*Cystophora cristata*) in Algeria. The Monachus Guardian 10(1).

- Council of Europe. 1991. Seminar on the conservation of the Mediterranean monk seal: technical and scientific aspects. Antalya, Turkey, 1-4 May 1991. T-PVS (91)25:1-94.
- Dendrinos P., Demetropoulos A. 2000. The Mediterranean monk seal in Cyprus. *The Monachus Guardian* 3 (2). 5 p.
- Font A., Mayol J. 2009. Mallorca's lone seal: the 2009 follow-up. *The Monachus Guardian* 12(2).
- GFCM. 2011. Recommendation GFCM/35/2011/5 on fisheries measures for the conservation of the Mediterranean monk seal (*Monachus monachus*) in the GFCM Competence Area. Report of the General Fisheries Commission for the Mediterranean's 35<sup>th</sup> Session, Rome. 3 p.
- Gomerčić T., Huber D., Đuras Gomerčić M., Gomerčić H. 2011. Presence of the Mediterranean monk seal (*Monachus monachus*) in the Croatian part of the Adriatic Sea. *Aquatic Mammals* 37(3):243-247. DOI 10.1578/AM.37.3.2011.243
- Güçlüsoy H., Kýraç C.O., Veryeri N.O., Savas Y. 2004. Status of the Mediterranean monk seal, *Monachus monachus* (Hermann, 1779) in the coastal waters of Turkey. *E.U. Journal of Fisheries & Aquatic Sciences* 21(3-4):201–210.
- Gucu A.C. 2004. Is the broken link between two isolated colonies in the Northeastern Mediterranean re-establishing? *The Monachus Guardian* 7(2).
- Gucu A., Mo G. 2009. "Who are our seals? Moving towards a standardised population estimate approach for *Monachus monachus*". Conclusions of the workshop presented within the framework of the conference. Workshop conducted within the framework of the European Cetacean Society Annual Conference, Istanbul, 28 Feb. 2009. 4 p.
- Gucu A.C., Ok M., Sakinan S. 2009a. A survey of the critically endangered Mediterranean monk seal *Monachus monachus* (Hermann, 1779) along the coast of Northern Cyprus. *Israel Journal of Ecology & Evolution* 55(1):77-82. DOI: 10.1560/IJEE.55.1.77
- Gucu A.C., Sakinan S., Ok M. 2009b. Occurrence of the critically endangered Mediterranean monk seal, *Monachus monachus* (Hermann, 1779), at Olympos-Beydagları National Park, Turkey. *Zoology in the Middle East* 46:3-8.
- Hamza A., Mo G., Tayeb K. 2003. Results of a preliminary mission carried out in Cyrenaica, Libya, to assess monk seal presence and potential coastal habitat. *The Monachus Guardian* 6(1).
- Hoyt E. (editor). 2012. Proceedings of the Second International Conference on Marine Mammal Protected Areas (ICMMPA 2). Fort-de-France, Martinique, 7-11 Nov. 2011. 103 p.
- Israëls L.D.E. 1992. Thirty years of Mediterranean monk seal conservation, a review. *Nederlandsche Commissie voor Internationale Natuurbescherming. Mededelingen* 28:1-65.
- IUCN. 2009. Resolution 4.023. Conservation and recovery of the Mediterranean monk seal *Monachus monachus*. Pp. 23-24 in: Resolutions and recommendations. IUCN, Gland, Switzerland, 158 p.

- IUCN/SSC. 2008. Strategic planning for species conservation: a handbook. Version 1.0. IUCN Species Survival Commission, Gland, Switzerland. 104 p.
- Jony M., Ibrahim A. 2006. The first confirmed record for Mediterranean monk seals in Syria. Abstract, p. 54 in: UNEP/MAP, RAC/SPA. 2006. Report of the International Conference on Monk Seal Conservation. Antalya, Turkey, 17-19 September 2006. 69 p.
- Karamanlidis A.A., Androukaki E., Adamantopoulou S., Chatzisprou A., Johnson W.M., Kotomatas S., Papadopoulos A., Paravas V., Paximadis G., Pires R., Tounta E., Dendrinou P. 2008. Assessing accidental entanglement as a threat to the Mediterranean monk seal *Monachus monachus*. *Endangered Species Research* 5: 205–213. doi: 10.3354/esr00092
- Kıraç C.O. 2001. Witnessing the monk seal's extinction in the Black Sea. *The Monachus Guardian* 4(2):1-3.
- Kıraç C.O. 2011. Conservation of the Mediterranean monk seal *Monachus monachus* in Turkey and the role of coastal & marine protected areas. Abstract, Second International Conference on Marine Mammal Protected Areas, Martinique, 7-11 November 2011.
- Kıraç C.O., Veyeri N.O., Güçlüsoy H., Savaş Y. 2011. National Action Plan for the conservation of Mediterranean monk seal *Monachus monachus* in Türkiye. UNEP-MAP-RAC/SPA, Tunis. 35 p.
- Langford I.H., Skourtos M.S., Kontogianni A., Day R.J., Georgiou S., Bateman I.J. 2001. Use and nonuse values for conserving endangered species: the case of the Mediterranean monk seal. *Environment and Planning A* 33:2219-2233. DOI:10.1068/a348
- Leader-Williams N., Dublin H. 2000. Charismatic megafauna as "flagship species". Pp. 53-81 in: Entwistle A. and Dunstone N. (eds), *Priorities for the conservation of mammalian diversity: has the panda had its day?* Cambridge University Press, Cambridge, UK.
- Marchessaux D. 1977. Will the Mediterranean monk seal survive? *Aquatic Mammals* 5(3):87.
- Marchessaux D. 1986. Etude de l'évolution du statut du phoque moine en Tunisie et dans l'archipel de la Galite. Report to RAC/SPA, Tunis, and IUCN. 25 p.
- Marchessaux D. 1989. Distribution et statut des populations du phoque moine *Monachus monachus* (Hermann, 1799). *Mammalia* 53(4):621-642.
- McNeely J.A. 1988. Economics and biological diversity: developing and using economic incentives to conserve biological resources. IUCN, Gland, Switzerland. xiv + 232 p.
- Mo G. 2011. Mediterranean monk seal (*Monachus monachus*) sightings in Italy (1998-2010) and implications for conservation. *Aquatic Mammals* 37(3):236-240. DOI 10.1578/AM.37.3.2011.236
- Mo G., Bazairi H., Bayed A., Agnesi S. 2011. Survey on Mediterranean monk seal (*Monachus monachus*) sightings in Mediterranean Morocco. *Aquatic Mammals* 37(3):248-255. DOI 10.1578/AM.37.3.2011.248
- Mo G., Gazo M., Ibrahim A., Ammar I., Ghanem W. 2003. Monk seal presence and habitat assessment: results of a preliminary mission carried out in Syria. *The Monachus Guardian* 6(1).

- Notarbartolo di Sciara G. 2010. The world's two remaining monk seal species: how many different ways are there of being Critically Endangered? *The Monachus Guardian* 13(1).
- Notarbartolo di Sciara G., Adamantopoulou S., Androukaki E., Dendrinou P., Karamanlidis A.A., Paravas V., Kotomatas S. 2009a. National strategy and action plan for the conservation of the Mediterranean monk seal in Greece, 2009-2015. Hellenic Society for the Study and Protection of the Mediterranean monk seal (MOM), Athens. 19 p.
- Notarbartolo di Sciara G., Adamantopoulou S., Androukaki E., Dendrinou P., Karamanlidis A.A., Paravas V., Kotomatas S. 2009b. National strategy and action plan for the conservation of the Mediterranean monk seal in Greece, 2009-2015. Report on evaluating the past and structuring the future. Publication prepared as part of the LIFE-Nature Project: MOFI: Monk Seal and Fisheries: mitigating the conflict in Greek Seas. Hellenic Society for the Study and Protection of the Mediterranean monk seal (MOM), Athens. 71 p.
- Notarbartolo di Sciara G., Fouad M. 2011. Monk seal sightings in Egypt. *The Monachus Guardian*, online edition. 29 April 2011.
- Panou A. 2009. Monk seal sightings in the central Ionian Sea: a network of fishermen for the protection of the marine resources. *Archipelagos – Environment and Development, Greece*. Presentation at the "Who are our seals?" Workshop, European Cetacean Society Annual Conference, Istanbul, Turkey, 28 February, 2009. 6 p.
- Pastor T., Garza J.C., Aguilar A., Tounta E., Androukaki E. 2007. Genetic diversity and differentiation between the two remaining populations of the critically endangered Mediterranean monk seal. *Animal Conservation* 2007:1-9. doi:10.1111/j.1469-1795.2007.00137.x
- RAC/SPA 2012. [http://www.rac-spa.org/monk\\_seal\\_death](http://www.rac-spa.org/monk_seal_death)
- Reeves R.R. (editor). 2009. Proceedings of the First International Conference on Marine Mammal Protected Areas, March 30 – April 3, 2009, Maui, Hawai'i, USA. NOAA. 133 p.
- Ronald K. 1984. Action for the conservation of monk seal. Pp: 109-112 in: K. Ronald and R. Duguay (editors). *Les phoques moines - Monk seals*. Proceedings of the Second International Conference, La Rochelle, France, 5 - 6 October 1984. *Annales de la Société des Sciences Naturelles de la Charente-Maritime*, Supplément, décembre 1984. 120 p.
- Ronald K., Duguay R. (editors). 1979. *The Mediterranean monk seal*. Proceedings of the First International Conference, Rhodes, Greece, 2-5 May 1978. UNEP Technical Series, Volume 1. Pergamon Press, Oxford. 183 p.
- Ronald K., Duguay R. (editors). 1984. *Les phoques moines - Monk seals*. Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. *Annales de la Société des Sciences Naturelles de la Charente-Maritime*, Supplément, décembre 1984. 120 p.
- Scheinin A.P., Goffman O., Elasar M., Perelberg A., Kerem D.H. 2011. Mediterranean monk seal (*Monachus monachus*) resighted along the Israeli coastline after more than half a century. *Aquatic Mammals* 37(3):241-242. DOI 10.1578/AM.37.3.2011.241

- Sergeant D., Ronald K., Boulva J., Berkes F. 1979. The recent status of *Monachus monachus* the Mediterranean monk seal. Pp. 31-54 in: K. Ronald, R. Duguy (editors), The Mediterranean monk seal. Proceedings of the First International Conference, Rhodes, Greece, 2-5 May 1978. UNEP Technical Series, Volume 1. Pergamon Press, Oxford. 183 p.
- Sergeant D.E. 1984. Review of new knowledge of *Monachus monachus* since 1978 and recommendations for its protection. Pp: 21-30 in: K. Ronald and R. Duguy (editors). Les phoques moines - Monk seals. Proceedings of the Second International Conference, La Rochelle, France, 5 - 6 October 1984. Annales de la Société des Sciences Naturelles de la Charente-Maritime, Supplément, décembre 1984. 120 p.
- UNEP-MAP-RAC/SPA, IUCN. 1988. Report of the joint expert consultation on the conservation of the Mediterranean monk seal. Athens, 11-12 January 1988. IUCN/UNEP/MEDU/MM-IC/5. 8 p.
- UNEP-MAP-RAC/SPA. 1994. Present status and trend of the Mediterranean monk seal (*Monachus monachus*) populations. Meeting of experts on the evaluation of the implementation of the Action Plan for the management of the Mediterranean monk seal, Rabat, Morocco, 7-9 October 1994. UNEP(OCA)/MED WG. 87/3. 44 p.
- UNEP-MAP-RAC/SPA. 1998. Report of the meeting of experts on the implementation of the action plans for marine mammals (monk seal and cetaceans) adopted within MAP. Meeting of experts on the implementation of the Action Plans for marine mammals (monk seal and cetaceans) adopted within MAP. Arta, Greece, 29-31 October 1998. UNEP(OCA)/MED WG. 146/5. 122 p.
- UNEP-MAP-RAC/SPA, ICRAM, ANPE. 2001. Assessment of Mediterranean monk seal (*Monachus monachus*) habitat at La Galite, Tunisia: towards a monk seal conservation strategy in northern Tunisia and nearby waters. By Ouerghi A., Mo G., Di Domenico F., Majhoub H., Tunis. 3 p.
- UNEP-MAP-RAC/SPA. 2003a. Action Plan for the management of the Mediterranean monk seal (*Monachus monachus*). Reprinted, RAC/SPA, Tunis. 12 p.
- UNEP-MAP-RAC/SPA. 2003b. The conservation of the Mediterranean monk seal: proposal of priority activities to be carried out in the Mediterranean Sea. By A. Bayed, A.GUCU, G.Mo, M. Dendrinou, Sixth Meeting of National Focal Points for SPAs, Marseilles, 17-20 June 2003. UNEP(DEC)/MED WG.232/Inf 6. 45 p.
- UNEP-MAP-RAC/SPA. 2005a. Information report on the status of the monk seal in the Mediterranean. Seventh Meeting of the National Focal Points for SPAs, Seville, 31 May–3 June 2005. UNEP(DEC)/MED WG. 268/Inf 3. 45 p.
- UNEP-MAP-RAC/SPA. 2005b. Declaration on the monk seal risk of extinction in the Mediterranean. Mediterranean Action Plan, Meeting of MAP Focal Points, Athens (Greece), 21-24 September 2005. UNEP(DEC)/MED WG.270/17, 30 June 2005. 3 p.
- UNEP-MAP-RAC/SPA. 2005c. Rapid assessment survey of important marine turtle and monk seal habitats in the coastal area of Albania, October – November 2005, By M. White, I., Haxhiu, V. Kouroutos, A., Gace, A., Vaso, S. Beqiraj, A. Plytas and Z. Dedej. 36 p.
- UNEP-MAP-RAC/SPA. 2006a. Report of the International Conference on Monk Seal Conservation. Antalya, Turkey, 17-19 September 2006. 69 p.

- UNEP-MAP-RAC/SPA. 2006b. Propositions d'actions concrètes pour la mise en oeuvre d'un plan de conservation et de gestion pour le phoque moine sur le littoral ouest algérien. Par Z. Boutiba. 42 p.
- UNEP-MAP-RAC/SPA. 2009. Assessment of the implementation of the Action Plan for the management of Mediterranean monk seal. UNEP(DEPI)/MED WG 331/Inf. 9.. Ninth Meeting of Focal Points of SPAs, Floriana, Malta, 3-6 June 2009. 50 p.
- UNEP-MAP-RAC/SPA, 2011 a , National Action Plan for the conservation of marine mammals in the Egyptian Mediterranean Sea - 2012-2016 by Notarbartolo di Sciarra G., Fouad M. Contract RAC/SPA 2011. 54 p.
- UNEP-MAP-RAC/SPA, 2011 b. National action plan for the conservation of the Mediterranean monk seal in Cyprus. by Demetropoulos A. Contract RAC/SPA: N°20/RAC/SPA\_2011. 24 p.
- UNEP-MAP-RAC/SPA, 2011c. National Action Plan for the conservation of Mediterranean monk seal *Monachus monachus* in Türkiye. By Kırac C.O., Veyerli N.O., Güçlüsoy H., Savaş Y. UNEP-MAP-RAC/SPA, Tunis. 35 p.
- UNEP-MAP-RAC/SPA, 2012. Action Plan for the conservation/management of the Monk seal in low density areas of the Mediterranean. by Gazo M., Mo G. Contract RAC/SPA, MoU n. 34/RAC/SPA\_2011. 29 p.
- Van Bree P.J.H. 1979. Notes on the differences between monk seals from the Atlantic and the Western Mediterranean. P. 99 in: K. Ronald and R. Duguay (editors), The Mediterranean monk seal. Proceedings of the First International Conference, Rhodes, Greece, 2-5 May 1978. UNEP Technical Series, Volume 1. Pergamon Press, Oxford. 183 p.
- Veyerli O., Güçlüsoy H., Savaş Y. 2001. Snared and drowned: are fishing nets killing off a new generation of monk seals in Turkey's protected areas? The Monachus Guardian 4(1).
- Wilhere G.F., Maguire L.A., Scott M., Rachlow J.L., Goble D.D., Svancara L.K. 2012. Conflation of values and science: response to Noss et al. Conservation Biology 26(5):943-944. DOI: 10.1111/j.1523-1739.2012.01900.x

Annex II

Updated Timetable of the Action Plan for the conservation of Mediterranean Marine Turtles

<i>Implementation Timetable (2014-2019)</i>			
<i>Actions</i>		<i>Deadline/periodicity</i>	<i>By whom</i>
<b>A.PROTECTION AND MANAGEMENT</b>			
<b>A.1 Legislation</b>	a. Protection of turtles—general species protection	As soon as possible	Contracting Parties
	b. Enforce legislation to eliminate deliberate killing	As soon as possible	Contracting Parties
	c. Habitat protection and management (nesting, mating, feeding, wintering and key migration passages)	As soon as possible	Contracting Parties
<b>A.2 Protection and Management of habitats</b>	a. Setting up and implementing management plans	From 2014 to 2019	Contracting Parties
	b. Restoration of damaged nesting habitats	From 2014 to 2019	Contracting Parties
<b>A.3 Minimisation of incidental Catches</b>	a. Fishing regulations(depth, season, gear) in key areas	From 2014 to 2019	Contracting Parties
	b. Modification of gear, methods and strategies Partners & Parties	From 2014 to 2019	RAC/SPA, partners and Contracting Parties
<b>A.4 Other Measure to Minimise individual Mortality</b>	a. Setting up and/or improving operation of Rescue Centres	As soon as possible	Contracting Parties
<b>B. SCIENTIFIC RESEARCH AND MONITORING</b>			
<b>B.1 Scientific Research</b>	a. Identification of new mating, feeding and wintering areas and key migration passages	From 2014 to 2019	Contracting Parties and partners
	b. Elaboration and execution of cooperative research projects of regional importance aimed at assessing the interaction between turtles and fisheries	From 2014 to 2019	RAC/SPA, partners and Contracting Parties
	c. Tagging and genetic analysis(as appropriate)	From 2014 to 2019	RAC/SPA, partners and Contracting Parties
	d. Facilitate the networking between managed and monitored nesting sites, aiming at the exchange of information and experience	From 2014 to 2019	RAC/SPA
<b>B.2 Monitoring</b>	a. Guidelines for long-term monitoring programmes for nesting beaches and standardisation of monitoring methods for nesting beaches, feeding and wintering areas	2 years after adoption	RAC/SPA
	b. Setting up and/or improving long-term monitoring programmes	From 2014 to 2019	RAC/SPA and Contracting Parties
	c. Setting up stranding networks	As soon as possible	Contracting Parties

	d. Standardization of methodologies to estimate demographic parameters for population dynamics analysis, such as population modelling.	3 years after adoption	RAC/SPA
	e. Tagging standardization	As soon as possible	RAC/SPA
<b>C. PUBLIC AWARENESS AND EDUCATION</b>			
	Public awareness and Information campaigns in particular for fishermen and local populations	From 2014 to 2019	RAC/SPA, partners and Contracting Parties
<b>D. CAPACITY BUILDING</b>			
	Training courses	From 2014 to 2019	RAC/SPA, Contracting Parties and partners
<b>E. NATIONAL ACTION PLANS</b>			
	Elaboration of National Action Plans	From 2014 to 2019	Contracting Parties
<b>F. COORDINATION</b>			
	a. Assessment of progress in the implementation of the Action Plan	Every two years	RAC/SPA and Contracting parties
	b. Cooperation in organizing the Mediterranean Conference on marine turtles	Every three years	RAC/SPA
	c. Updating the action plan on Marine Turtles	Five years	RAC/SPA



**Annex III**

**Updated Timetable of the Action Plan for the conservation of bird species listed in Annex II of the SPA/BD Protocol in the Mediterranean**

<i>Implementation Timetable (2014-2019)</i>		
<b>Action</b>	<b>Deadline/periodicity</b>	<b>By whom</b>
1. Produce and publish an updated version of the Action Plan including all 25 target species.	By 2015	RAC/SPA
2. Protect legally all bird species in Annex II	By 2019	Contracting Parties
3. Optimize synergies with international agreements and organizations dedicated to bird conservation	From 2014 to 2019	Contracting Parties
4. Target and lobby decision-making organizations and government bodies to stimulate the implementation of the Action Plan	From 2014 to 2019	Contracting Parties, Partners and RAC/SPA, ICCAT, GFCM
5. Organize specific training courses and workshops in coordination/synergy with international and/or national NGOs	From 2014 to 2019	RAC/SPA Contracting Parties, AP partners, AEWA, Birdlife International, ICCAT, GFCM
6. Organization of the 3 <sup>rd</sup> Mediterranean Symposium on ecology and conservation of the bird species listed in Annex II	By 2017	RAC/SPA and Contracting Parties
7. Participation in / promotion of a regional network for monitoring populations and distribution of Mediterranean threatened bird species, in co-ordination with other organizations	From 2014 to 2019	RAC/SPA, AP partners, AEWA, Birdlife International
8. Establishment / support of research and monitoring programs to fill gaps in the knowledge of threatened species in partnership with other organizations	From 2014 to 2019	RAC/SPA, Contracting Parties, AP partners, AEWA, Birdlife International
9. Establishment and implementation of National Action Plans for the conservation of endangered and threatened bird species in the Mediterranean	From 2014 to 2019	RAC/SPA, Contracting Parties

10. Support contracting parties and partners to produce and publish relevant scientific documentation contributing to update knowledge and enhance conservation action taken on the Annex II species	From 2014 to 2019	RAC/SPA, AP partners, AEWA, Birdlife International, ICCAT, GFCM
11. Identification of areas important for birds on land and at sea (mapping of breeding, feeding, molting and wintering areas).	From 2014 to 2019	Contracting Parties, AP partners, AEWA, Birdlife International,
12. Legal establishment of Protected Areas (PAs) with adequate management plans at breeding sites	By 2019	Contracting Parties
13. Produce the 3 <sup>rd</sup> Report on progress in the implementation of the Action Plan according to the proposed achieved indicators	By 2019	RAC/SPA

#### Annex IV

#### Updated Timetable of the Action Plan for the conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea

<i>Implementation Timetable (2014-2019)</i>		
<b>Action</b>	<b>Deadline/periodicity</b>	<b>By whom</b>
<b>Tools</b>		
1. Update directory of national, regional and international experts on chondrichthyan fishes.	By 2015	RAC/SPA, CMS Shark MOU Secretariat, IUCN SSG, RFMO Shark Working Groups
2. Develop, print and distribute multilingual regional and national field identification guides and sheets for remaining priority areas: Adriatic, Aegean, Ionian (in Croatian, Albanian, Italian, Greek, Turkish); and Northwestern Mediterranean (French, Spanish).	2014 – 2015	GFCM/FAO, MEDITS, National scientific and management bodies, Regional cooperation agencies
3. Promote use of existing standard monitoring protocols and forms (RAC/SPA, FAO) for species-specific data on landings, discards and observations of threatened species;	From 2014 to 2019	National scientific and management bodies, Regional cooperation agencies, MedLEM, CMS, GFCM and FAO
4. Update and promote protocols and programmes for improved compilation and analysis of data, for contribution to regional stock assessment initiatives.	From 2014 to 2019	National and regional agencies and advisory bodies, CMS, GFCM and FAO
5. Formalize/reinforce synchronous submission of catch, bycatch and discard data to both scientific and management bodies, and annually to the GFCM.	Every year From 2014 to 2019	Contracting Parties
6. Improve data on elasmobranch bycatch in national reports to GFCM, for incorporation in GFCM database	Every year From 2014 to 2019	Contracting Parties, GFCM, MEDLEM
7. Undertake information campaigns, improve the provision of materials for publication, and disseminate more widely existing RAC/SPA, FAO, CMS and other relevant products to fisheries managers, researchers and the public.	2014, 2016, 2018	AP Partners, Associates and donor agencies

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

21. Support expert participation in RFMO and other relevant meetings and workshops, to share expertise and build capacity for data collection, stock assessment and bycatch mitigation.	As soon as possible	Contracting Parties, RFMO, RAC/SPA
<b><i>Management and assessment procedures</i></b>		
22. Continuously review data and undertake new studies to clarify the status of Mediterranean endemics and large bodied species assessed as Data Deficient or Near Threatened	2014, 2017	Contracting Parties, Partners
23. Monitor Critically Endangered, Endangered and endemic species	From 2014 to 2019	Contracting Parties
24. Submit to the GFCM annual Shark Assessment Reports describing all national target and/or bycatch fisheries	Every year	Contracting Parties
25. Develop and adopt (where these do not exist) national Shark Plans and specific regulations for fisheries exploiting chondrichthyans, whether target or bycatch.	As soon as possible	Contracting Parties individually and through GFCM
26. Develop a Regional Shark Plan and associated fisheries management regulations outside territorial waters.	2015	Contracting Parties, GFCM
27. Review national and regional Shark Plans every four years	2014, 2018	Contracting Parties, GFCM
29. Continue to implement programme for the development of stock assessments, by area and by species.	2014, 2016, 2019	Contracting Parties, GFCM
30. Assessment of progress in the implementation of the Action Plan and update its timetable	2019	RAC/SPA, Contracting Parties



## **Annex V**

**Action Plan for the conservation of habitats and species associated with seamounts, underwater caves and canyons, aphotic hard beds and chemo-synthetic phenomena in the Mediterranean Sea  
(Dark Habitats Action Plan)**





## Table of contents

<b>1. PRESENTATION</b>	<b>119</b>
<b>A. State of knowledge</b>	<b>119</b>
A.1 – Assemblages of underwater caves.....	<b>119</b>
A.2 – Assemblages of underwater canyons.....	<b>120</b>
A.3 – Engineering benthic invertebrate assemblages .....	<b>121</b>
A.4 – Deep-sea chemo-synthetic assemblages (mud volcanoes, cold seeps, ‘pockmarks’, brine anoxic lakes, hydrothermal springs) .....	<b>122</b>
A.5 – Assemblages associated with seamounts.....	<b>123</b>
<b>B. Main threats</b>	<b>124</b>
<b>2. OBJECTIVES OF THE ACTION PLAN</b>	<b>125</b>
<b>3. ACTIONS REQUIRED TO ATTAIN THE OBJECTIVES OF THE ACTION PLAN</b>	<b>125</b>
<b>A. Improvement and acquisition of knowledge</b>	<b>125</b>
<b>B. Management measures</b>	<b>126</b>
B.1 – Legislation.....	<b>126</b>
B.2 – Setting up MPAs.....	<b>126</b>
B.3 – Other management measures.....	<b>127</b>
<b>C. Public awareness and information</b>	<b>127</b>
<b>D. Enhancing national capacities</b>	<b>127</b>
<b>E. National plans</b>	<b>128</b>
<b>4. REGIONAL COORDINATION AND IMPLEMENTATION</b>	<b>128</b>
<b>5. IMPLEMENTATION SCHEDULE</b>	<b>129</b>
<b>6. BIBLIOGRAPHY</b>	<b>130</b>



## 1. PRESENTATION

### A. State of knowledge

Dark habitats are environments where the luminosity is extremely weak, or even absent (aphotic area) leading to an absence of macroscopic autochthonous photosynthesis.

The bathymetric extension of this lightless area depends to a great extent on the turbidity of the water and corresponds to benthic and pelagic habitats starting from the deep circa-littoral. Caves which show environmental conditions that favour the installation of organisms characteristic of dark habitats, are also taken into account.

Dark habitats are dependent on very diverse geo-morphological structures (e.g. underwater caves, canyons, slopes, isolated rocks, seamounts, abyssal plains).

#### ***A.1 – Assemblages of underwater caves***

Underwater caves are 'natural cavities big enough to permit direct exploration by man' [1]. Dark underwater caves are lightless enclaves of the marine environment, with lighting less than 0.01% [2] and a fairly confined space. Dark underwater caves are often reservoirs of unknown biodiversity and refuges for generally very non-resilient communities [2].

Semi-dark underwater caves are not included in this Action Plan as they are already integrated into the "Action plan for the conservation of the coralligenous and other calcareous bio-concretions in the Mediterranean Sea"

Underwater caves are particularly well represented in all the rocky karst or fractured coastlines and are probably very widespread at Mediterranean level. Although we do not have an exhaustive view of the situation, several actions, specific to these habitats, have recently been started:

- Since the 1950s, researchers from the Endoume Marine Station (Marseilles) have been more particularly studying the underwater caves of France's Mediterranean coast. A great number of caves have been identified, and sometimes described, and the main species have been paid particular and systematic attention and also studied from a functional and progressive angle. Most of these results have fed into the assessments made at national (ZNIEFF sea) and European (Natura 2000) level. Since 2011, the French Marine Protected Areas Agency has undertaken systematic research on these habitats in the sectors mapped within the CARTHAM programme (CARTography of heritage Marine Habitats) and the Corsican DREAL has sponsored an inventory of the island's whole coastline (97 dark caves)
- From 2003 on, Italian researchers with the support of the Ministry of the Environment have brought out an atlas with a CD on the distribution of underwater caves by geographic sector (1). Additionally, a national system of geo-location of the caves has been set up, accessible online ([catastogrotte.speleo.it](http://catastogrotte.speleo.it))
- Inventorying is now being done as part of the Greek-European NETMED programme and has recorded over 2,700 marine caves in the 13 Mediterranean countries inventoried.

In terms of conservation, as far as the Mediterranean European states are concerned, caves are natural habitats that come under Habitat Directive on the conservation of natural habitats and of wild fauna and flora and appear as such as priority habitats requiring protection (Directive 92/43). Lastly, a certain number of underwater caves enjoy protection status because they fall within the geographical boundaries of Marine Protected Areas (MPAs):

(e.g. the Karaburun-Sazan National Marine Park (Albania), the Telašćica Nature Park (Croatia), the Lastovo Archipelago National Park (Croatia), the Mèdes Islands Marine Reserve (Spain), the Port-Cros National Park (France), the Calanques National Park (France), the Alonissos and Northern Sporades National Marine Park (Greece), the Zakynthos Marine National Park (Greece), the Capo Caccia/Isola Piana Marine Protected Area (Italy), the Punta Campanella Marine Protected Area (Italy), the Tremiti Islands Marine Nature Reserve (Italy), the Ustica Islands Marine Nature Reserve (Italy), the Palm Islands Reserve (Lebanon), the Dwejra Marine Area (Malta), the Mgarr ix-Xini Marine Area (Malta), the Ghar Lapsi and Filfla Marine Area (Malta), the Marine Area between Rdum Majjiesa and Ras ir-Raheb (Malta), the North-east Malta Marine Area, the Al-Hoceima National Park (Morocco) and the Galite Archipelago (Tunisia)).

### **A.2 – Assemblages of underwater canyons**

Canyons are valleys with sometimes steep walls and V-shaped sections that are like land canyons but bigger; they often present tributaries and rocky outcrops that can be sizeable [3].

These are elements that play an important part in the way the Mediterranean ecosystem functions, insofar as they constitute the main route for transferring matter between the coast and the deep sea [4]. Thus they can represent biodiversity hotspots and recruiting areas (Sardà *et al.*, 2004 in [4]). Lastly, in the light of the Convention on Biological Diversity (2008), underwater canyons present characteristics that class them as priority conservation areas (Chalabi, 2012 in [3]).

These structures are extremely frequent and concern all the Mediterranean countries. Thus, even though over 518 important canyons have been identified [3], less than 270 are sited in detailed fashion (Figure 1), and they are probably more numerous in the light of the geomorphological maps of the Mediterranean seabed.

At present, underwater canyons are not much taken into account in terms of conservation insofar as only a few of them are protected by inclusion in existing MPAs (the Golfe du Lion Marine Nature Park and Calanques National Park canyons, France; the Pelagos Specially Protected Area of Mediterranean Importance (SPAMI) canyons, France, Monaco and Italy; the Mar Menor SPAMI canyon and coasts of the Murcia region, Spain).

Also, since 2009 the Montpellier, petit-Rhône and grand-Rhône canyons have been integrated within the Golfe du Lion restricted fishing area adopted by the General Fisheries Commission for the Mediterranean (GFCM) [5].



Figure 1: Distribution of main canyons identified in the Mediterranean (after authors of Document & [3], [6]). Map: Google earth©

### ***A.3 – Deep Water Engineering benthic invertebrate assemblages***

Assemblages of engineering benthic invertebrates are found on several kinds of substratum and, in the Mediterranean, give rise to unique formations of conservation interest such as:

- black coral forests (Antipatharians) and Gorgonia on hard substrata
- beds with *Isidella elongata* and beds with *Pennatula* on crumbly substrata
- associations of big sponges and ‘deep water corals’ present on both kinds of substratum.

These various formations can be more or less overlapping and they shelter ecosystem-building species that provide a hard biogenic habitat as well as a network of interstices for many other organisms. Among these, the ‘deep sea corals’ shelter a very high specific richness with over 220 species [7], constitute the base of complex food chains and represent, the FAO says (2008), one of the best known examples of vulnerable marine ecosystems (Marin & Aguilar in [3]).

Although there is still not much information on where they are to be found, living ‘deep water corals’ do not seem to be frequent in the Mediterranean (Figure 2; [8]). They are particularly found on rocky escarpments, walls of canyons, seamounts, and also on rocky surfaces that stand permanently clear of bathyal silts.



**Figure 2:** Location of some populations of structuring invertebrates in the Mediterranean. These are mostly ‘deep water corals’ (after authors of Document & [8], [9], [10]). Map: Google earth©

Their presence can thus be a necessary precondition for setting up specific measures. Although at present they are still not much taken into account in terms of conservation, since only the Santa Maria de Leuca reef with *Lophelia* and *Madrepora* has since 2006 been included as a restricted fishing area by GFCM [11], they are at the origin of the creation of MPAs (e.g. the Cassidaigne and Lacaze-Duthiers canyons, France). Similarly, two sites have been chosen to this effect by Italy (Continental slopes of the Tuscan Archipelago and Santa Maria de Leuca sector) for setting up the Natura 2000 at-sea network, and many are included in the proposal to set up a representative MPA in the Sea of Alboran [6].

#### ***A.4 – Deep-sea chemo-synthetic assemblages (mud volcanoes, cold seeps, ‘pockmarks’, brine anoxic lakes, hydrothermal springs)***

It was in the 1990s that the first descriptions on deep-sea populations based on chemo-synthesis started (Corselli & Basso, 1996 in [12]). They are often associated with underwater mud volcanoes, but more generally any emission (‘cold seeps’) on the surface of the sediment of reduced gas or fluids (methane, sulphurs, etc.) permits the developing of chemo-autotrophic microbial communities, themselves at the base of a particular food chain, quasi-disconnected to surface photosynthesis.

In the Mediterranean we are therefore familiar with mud volcanoes and also ‘pockmark’ areas, shallow craters that form after gas has been released. Hyper-saline anoxic lakes have also been discovered between 3,200 and 3,600 metres down in the eastern basin (Lampadariou et al., 2003 in [12]). They also give rise to chemo-autotrophic primary production. Lastly, areas with hot hydrothermal springs are found at the level of underwater volcanoes in the Tyrrhenian Sea (Marsili Seamount). These Mediterranean chemo-synthetic communities are deemed to be relatively isolated vis-a-vis the Atlantic Ocean (Fiala-Médioni, 2003 in [12]). Hyper-saline anoxic lakes, because of the combination of almost saturated salt concentrations, high hydrostatic pressures, absence of light, anoxia and the high stratification of the water layers certainly constitute habitats that are among the planet’s most extreme. They mainly contain bacterial communities and metabolically active Archaeans, specific to these environments [4].

'Cold seeps' seem to be well represented along the Mediterranean fold (eastern basin; Figure 3). 'Mud volcanoes' are frequent in the eastern basin especially at the level of the Mediterranean fold and in the south-east of the basin, but the discovery of 'pockmarks' around the Balearic Islands allows us to envisage their existence in the western basin (Acosta et al., 2001, in [12]; Figure 3). Lastly, six hyper-saline anoxic lakes have been localised at the level of the Mediterranean fold [4] (Figure 3).



**Figure 3:** Locating chemo-synthetic populations that have been studied in the Mediterranean (after authors of Document & [6], [12], [13], [14], [15]). Map: Google earth©

Among these deep-sea chemo-synthetic populations only the 'cold seeps' of the Nile Delta are currently taken into account in terms of conservation, since it has since 2006 been included as a restricted fishing area by GFCM [4].

#### ***A.5 – Assemblages associated with seamounts***

In the Mediterranean, seamounts are raised parts of the seabed, ending in a peak, and of limited extent, which never reach the surface [16].

Although seamounts have so far been little studied from the biological angle in the Mediterranean, they seem to contain a unique biodiversity characterised by high rates of endemic species and could act as refuges for relic populations or constitute speciation areas (Galil & Zibrowius, 1998 in [12]).

The Mediterranean in its wider sense (including the Black Sea) probably contains about 200-300 seamounts, most of them in the western basin (Figure 4), with over 127 of them at the level of the Tyrrhenian Sea and the Sicily-Tunisian Strait.



**Figure 4:** Distribution of the main Mediterranean seamounts (Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo & the GIS User Community; map: Google earth©)

At present, these seamounts are little taken into account in terms of conservation since only that of Eratosthenes (eastern basin) has since 2006 been included as a restricted fishing area by GFCM [3].

## **B. Main threats**

Apart from a limited number of sectors, the small size of the Mediterranean continental shelf leads to a strong interaction between the land and sea domains; thus the impact of earth-origin pressures is felt down to sizeable depths. Such impacts may be of natural origin (mouths of coastal rivers, underwater cascades) or of human origin (discharge from urban and industrial pipes, coastal development, exploiting of living and subsoil resources, prospecting). Similarly, this proximity leads to strong interaction between the euphotic and aphotic domains, particularly via the supply of nutritive elements at the base of many trophic chains, and the transfer and fixing of larvae both for the pelagic and benthic fields.

The main threats hanging over dark habitats therefore depend greatly on their location (distance from coast, presence of rivers, proximity of big population centres and industrial complexes), their depth, their morphology (slope, substratum, structure) and the uses to which they are put (exploiting of resources).

In this respect underwater caves are specific entities, being, because of their often shallow depth and their nearness to the coast, easy of access. Also, the caves, at least in their 'semi-dark' parts, constitute landscapes of high aesthetic or archaeological value and are therefore often visited, leading to mechanical harm particularly from divers. Using destructive methods (e.g. dynamite) in coastal development work is likely to significantly affect these habitats.

Changes in the quality of the environment (accumulation of nutriment, contamination by run-off water, rise in water temperature) can impact these environments. Although the dark caves are less frequented, they are especially fragile and constitute veritable reservoirs of knowledge and biodiversity that must at all costs be protected [17]. Indeed, the slightest disturbance can cause considerable damage and impacted communities will take a long time to recover their state of equilibrium (extremely lengthy adjustment of stability).



Other dark populations undergo different pressures, at least in part, to those hanging over the underwater caves. There, too, although changes in the quality of the environment can play a non-negligible part (acidification of the water) specific threats are identified.

These mainly concern impacts linked to the exploiting of living resources (gathering red coral, trawling, fishing with palangres, or mesh nets, lost or abandoned fishing gear), the accumulation of waste (land-origin arrivals, direct discharge at sea, submersion of rubble from dredging), research activities (seismic, sampling), and undersea prospecting (drilling, exploiting hydrocarbons; military activities [12]).

Thus, recent studies have shown that as well as displacing sediments, trawling affects the morphology of the seabed, as is shown by high-resolution relief maps of the seabed, and can cause damage equal to that caused by ploughing farmland [18].

Similarly, the fragility of cold-water corals makes them very vulnerable to fishing activities, especially trawling, and also to mesh nets and palangres, whether directly or because of the changes in the environment caused by some of the fishing gear. Moreover, recolonisation can prove very difficult or even impossible in the light of the reduced growth of the main builders [19].

Similarly the burying at great depths of waste from the exploiting of mines is often seen as one of the options available for eliminating that waste [20].

## **2. OBJECTIVES OF THE ACTION PLAN**

The objectives of the Action Plan are to:

- conserve the habitats' integrity, functionality (favourable state of conservation) by maintaining the main ecosystem services (e.g. carbon sink, halieutic recruitment and production, biogeochemical cycles) and their interest in terms of biodiversity (e.g. specific diversity, genetics)
- encourage the natural restoration of degraded habitats (reduction of human origin impacts)
- improve knowledge about dark populations (e.g. location, specific richness, functioning, typology).

## **3. ACTIONS REQUIRED TO ATTAIN THE OBJECTIVES OF THE ACTION PLAN**

Actions needed to achieve the aims can be put into four categories:

### **A. Improvement and acquisition of knowledge**

Scientific data on the biology, ecology and functioning of the various dark populations is still rare and hard of access. Thus, we should improve this knowledge in order to possess the information that is vital for implementing an optimal management strategy for each of these populations, in particular by:

- assessing available knowledge, taking into account not only national and regional data (e.g. RAC/SPA, GFCM, IUCN, OCEANA, WCMC) but also scientific works. The information will be integrated within a geographical information system (GIS) and could be shared via online consultation

- setting up a database of people-resources in identified fields (i.e. caves, deep-sea populations), of institutes and bodies working in this field and of the available means of investigation
- quantifying the proven or potential pressures (e.g. commercial and recreational fishing, leisure activities and diving, undersea prospecting).

New knowledge must be acquired in areas of regional interest to promote a multidisciplinary approach and enhance international cooperation over these sites. Such joint action will permit the exchange of experience and the setting up of shared management strategies (crafting guidelines).

Regularly holding theme-based workshops that bring together experts on these dark populations will enable an assessment to be made of how far knowledge has progressed.

## **B. Management measures**

Management procedures involve enacting laws aimed at regulating human activities likely to affect dark populations and permit their long-term conservation.

### ***B.1 – Legislation***

Thus, we must identify endangered or threatened dark populations and grant them the status of protected species as defined in Article 11 of the Protocol on Specially Protected Areas and Biological Diversity (SPA/BD Protocol, [21]).

The regulations on impact studies must be strengthened to make assessing the impacts on dark populations compulsory. The regulations should pay particular attention in the event of coastal development, the prospecting and exploiting of natural resources and the discharge at sea of materials.

Insofar as regulatory procedures already exist at international level to restrict or ban certain human activities, we should work to have them applied and developed. This is particularly so for the ban on trawling at depths of over 1,000 metres down in the Mediterranean or the setting up of Restricted Fishing Areas (RFA) as adopted in the context of the mandate of the General Commission on Mediterranean Fisheries [11]. The Mediterranean states are invited to use, and enhance, all the means already available to ensure better conservation of dark populations.

### ***B.2 – Setting up MPAs***

Designation of Marine Protected Areas intended to permit more efficacious conservation of these dark assemblages must be based on the identification of emblem sites on the basis of the criteria (uniqueness or rarity, particular importance for species biological stages, importance for threatened, endangered or declining habitats or species, vulnerability and reduced recuperative capacity after disturbance, biological productivity, biological diversity and naturality) that were adopted in 2009 by the Contracting Parties [22].

As part of the work done by RAC/SPA in 2010, many sites that met, these criteria have already been identified for the creation of MPAs, in open sea areas, including the deep seas [23]. It is necessary to pursue and build upon this approach via the procedures in Article 9 of the SPA/BD Protocol [21].

Similarly, it would be helpful to identify from among the already existing MPAs those that exist near sites of interest for the conservation of dark assemblages and to study the feasibility of extending them so that these sites are included within the boundaries of the MPA.

### ***B.3 – Other management measures***

Measures should be identified to reduce the pressures that hang over these dark assemblages and to implement them (e.g. guidelines).

In the light of the precautionary principle, particular attention will be paid to the impacts that could arise as a result of the acidification and/or fertilization of the oceans and the setting up of new emergent fisheries (border areas).

MPAs which host dark assemblages (e.g. dark caves) should update their management plans to include measures adapted to the conservation of these caves.

Procedures aimed at assessing the efficacy of these measures as a whole will be defined in consultation with the organisations concerned by the management of these dark assemblages (e.g. international conventions, GFCM, IUCN, NGOs) to promote sustainable, adaptable and concerted management.

Similarly, possession of a state of reference is a necessary precondition for setting up a system to monitor over time the maintenance in good condition of these dark assemblages. It is also helpful in the sites for which data already exists to start monitoring procedures (return to the site) and in sites which have not yet been studied to establish a 'zero' state. Defining ecological indicators and biodiversity and vulnerability indices should permit the crafting of predictive scenarios for managing these habitats and their dependent populations. Making this approach general should in time permit the building up of a network of sites for monitoring.

## **C. Public awareness and information**

Information and awareness programmes to make dark populations, their vulnerability and the interest for conservation better known should be crafted for decision-makers, users (e.g. divers, fishermen, mine operators) and the wider public (environment education). The participation of NGOs in these programmes will be encouraged.

## **D. Enhancing national capacities**

In the light of the geographical distribution of many of these dark populations (outside waters that lie within national jurisdiction) and the difficulties of reaching them (bathymetric bracket, scientific means required, lack of knowledge, cost of study), it is important to:

- encourage the introduction of international cooperation to create synergies between the various actors (decision-makers, scientists, socio-professionals) and set up shared management
- organise training courses and encourage the exchange of cross-border experience so as to enhance national capacities in the field

## **E. National plans**

To give greater efficacy to the measures envisaged for setting up the present Action Plan, the Mediterranean countries are invited to craft national plans for the protection of dark assemblages. Each national plan must bear in mind the specific features of the country and even the areas concerned. It must suggest appropriate legislative measures, particularly as regards impact studies for coastal development and to check the activities that can affect these assemblages. The national plan will be drawn up on the basis of the scientific data available and will include programmes for: (i) gathering and continuous updating of data, (ii) training and retraining for specialists, (iii) education and awareness for the public, actors and decision-makers, and (iv) the conservation of dark populations that are significant for the marine environment in the Mediterranean. These national plans must be brought to the attention of all the concerned actors and as far as is possible coordinated with other pertinent national plans (e.g. emergency plan against accidental pollution).

## **4. REGIONAL COORDINATION AND IMPLEMENTATION**

Regional coordination of the implementation of the present Action Plan will be handled by the Secretariat of the Mediterranean Action Plan (MAP) via the Regional Activity Centre for Specially Protected Areas. The coordinating structure's main functions are:

- gathering, summarizing and circulating knowledge at Mediterranean level and permitting this to be integrated within the available instruments (e.g. FSD)
- setting up and updating databases on people/resources, laboratories involved and investigation means available
- helping states identify and assess the pressures on the various dark populations at national and regional level
- promoting studies on dark populations and making inventories of species in order to better grasp the way they function and better assess the ecosystem services they provide
- promote cross-border cooperation
- back the setting up of dark population monitoring networks
- organise meetings of experts and training courses on dark populations
- prepare reports on how implementation of the Action Plan is progressing, for submission to the Meeting of National Focal Points for SPAs and meetings of the Contracting Parties
- establish a work programme for implementing the Action Plan over a five-year period, which will be submitted to the Contracting Parties for adoption. At the end of this period, if necessary, after assessment and updating, it can be repeated.

Implementing the present Action Plan is the responsibility of the national authorities of the Contracting Parties. At each of their meetings, the National Focal Points for SPAs shall assess how far the Action Plan is being implemented on the basis of national reports on the subject and a report made by RAC/SPA on implementation at regional level. In the light of this assessment, the Meeting of National Focal Points for SPAs will suggest recommendations to be submitted to the Contracting Parties. If necessary, the Meeting of Focal Points will also suggest adjustments to the schedule that appears in the Appendix to the Action Plan.

Supplementary work done by other international and/or non-governmental organisations, aiming at the same objectives, should be encouraged, encouraging their coordination and avoiding duplication of effort.

At their ordinary meetings, the Contracting Parties could, at the suggestion of the Meeting of National Focal Points for SPAs, in order to encourage and reward implementation of the Action Plan, grant the title of 'Action Plan Partner' to any structure that may so request. This label will be granted on the evidence of proven involvement in the implementing of the present Action Plan attested by concrete actions (e.g. conservation, management, research, awareness etc.). The label can be extended at the same time as the multi-annual work programme on the grounds of an assessment of actions carried out during that period.

## 5. IMPLEMENTATION SCHEDULE

<b>Actions</b>	<b>Time</b>	<b>Who</b>
Making a summary of knowledge of dark populations and their distribution around the Mediterranean in the form of a geo-referenced information system	As soon as possible, and continuously	RAC/ SPA and Contracting Parties
Setting up a database of people/resources and means of investigation available	As soon as possible, and continuously	RAC/SPA
Identify and assess proven pressures on each of the various types of habitat	Year 1	RAC/ SPA, Partners and Contracting Parties
Revise the reference list of types of marine habitat for the selection of sites for inclusion in the national inventories of natural sites of conservation interest, in order to take account of dark assemblages	Years 1 and 2	RAC/ SPA and Contracting Parties
Revise the list of endangered or threatened species in order to take account of dark assemblages species	Years 1 and 2	RAC/ SPA and Contracting Parties
Promote the identifying of areas of interest for the conservation of dark assemblages in the Mediterranean and Carry out concerted actions in national and/or cross-border sites	Years 1 and 2	Contracting Parties RAC/ SPA and Contracting Parties
Finalise the implementing of MPAs in already identified sites at national level and outside waters that lie within national jurisdiction Propose the creation of new MPAs	Starting from Year 2	RAC/ SPA and Contracting Parties
Encourage the extension of existing MPAs to integrate nearby sites that host dark assemblages	Starting from Year 2	Contracting Parties
Introduce national legislation to reduce negative impacts Integrate taking dark assemblages into account within impact studies procedures	On adoption	Contracting Parties
Regularly hold theme-based workshops (in coordination with those of the 'Coralligenous' AP	Every three years	RAC/SPA
Propose guidelines suited to the inventorying and monitoring of dark assemblages	Starting from Year 2	RAC/SPA and Partners
Implement monitoring systems	Starting from Year 3	RAC/SPA and Contracting Parties
Enhance cooperation actions with concerned organisations and in particular with GFCM	On adoption	RAC/SPA
Step up awareness and information about dark assemblages with the various actors	Continuously	RAC/SPA, partners and Contracting Parties
Enhance national capacities and improve skills in taxonomy and monitoring methods	As needed	RAC/SPA

## 6. BIBLIOGRAPHY

1. Cicogna, F., et al. (2003) Grotte marine: cinquant'anni di ricerca in Italia. Ministero dell'ambiente e della tutela del territorio
2. Harmelin, J.G., et al. (1985) Dark submarine caves - An extreme environment and a refuge-biotope. *Téthys* 11, 214-229
3. Wurtz, M. (2012) Mediterranean submarine canyons: Ecology and governance. UICN
4. Danovaro, R., et al. (2010) Deep-Sea Biodiversity in the Mediterranean Sea: The Known, the Unknown, and the Unknowable. *PLoS ONE* 5, 1-25
5. CGPM (2009) Rapport de la trente-troisième session. Tunis, 23-27 mars 2009. Fishery and Agriculture Organization
6. UICN (2012) Propuesta de una red representativa de áreas marinas protegidas en el mar de Alborán / Vers un réseau représentatif d'aires marines protégées dans la mer d'Alboran. UICN
7. Mastrototaro, F., et al. (2010) Biodiversity of the white coral bank off Cape Santa Maria di Leuca (Mediterranean Sea): An update. *Deep Sea Research Part II: Topical Studies in Oceanography* 57, 412-430
8. Freiwald, A., et al. (2009) The WHITE CORAL COMMUNITY in the Central Mediterranean sea revealed by ROV surveys. *Oceanography* 22, 59-74
9. Pardo, E., et al. (2011) Documentacion de arrecifes de corales de agua fria en el Mediterraneo occidental (Mar de Alboan). *Chronica naturae*, 20-34
10. Taviani, M., et al. (2010) Pleistocene to Recent scleractinian deep-water corals and coral facies in the Eastern Mediterranean. *Facies* 57, 579-603
11. GFCM (2006) Report of the Thirtieth Session. Istanbul, Turkey, 24-27 January 2006. In GFCM Report (Mediterranean, G.F.C.f.t., ed), pp. 56, Food and Agriculture Organization
12. WWF and IUCN (2004) Mediterranean deep-sea ecosystems an overview of their diversity, structure, functioning and anthropogenic impacts, with a proposal for their conservation. IUCN Centre for Mediterranean Cooperation & WWF Mediterranean Programme
13. Dupré, S., et al. (2010) Widespread active seepage activity on the Nile Deep Sea Fan (offshore Egypt) revealed by high-definition geophysical imagery. *Marine Geology* 275, 1-19
14. Lastras, G., et al. (2004) Shallow slides and pockmark swarms in the Eivissa Channel, western Mediterranean Sea. *Sedimentology* 51, 837-850
15. Taviani, M., et al. (2013) The Gela Basin pockmark field in the strait of Sicily (Mediterranean Sea): chemosymbiotic faunal and carbonate signatures of postglacial to modern cold seepage. *Biogeosciences Discussions* 10, 967-1009
16. Ballesteros, E., et al. (2013) Els monts submarins. In *Atles dels ecosistemes* (Bueno, D., ed), pp. 320, Enciclopèdia Catalana

17. Gerovasileiou, V. and Voultsiadou, E. (2012) Marine caves of the Mediterranean sea: A sponge biodiversity reservoir within a biodiversity hotspot. PLoS ONE 7
18. Puig, P., et al. (2012) Ploughing the deep sea floor. Nature 489, 286-289
19. Clark, M.R., et al. (2006) Seamounts, Deep-sea corals and Fisheries: vulnerability of deep-sea corals to fishing on seamounts beyond areas of national jurisdiction. UNEP-WCMC
20. CIESM (2003) Mare Incognitum ? Exploring Mediterranean deep-sea biology. CIESM
21. PNUE-PAM-CAR/ASP (1995) Protocole relatif aux Aires Spécialement Protégées et à la Diversité Biologique en Méditerranée (Barcelone, 1995). CAR/ASP,
22. PNUE-PAM-CAR/ASP (2009) Proposition concernant un programme de travail régional pour les Aires Protégées Marines et Côtières de la Méditerranée. In Document de travail pour la neuvième réunion des Points Focaux nationaux pour les ASP, 3-6 Juin 2009, Floriana - Malte (Notarbartolo di Sciara, G. and Rais, C., eds), pp. 1-37
23. UNEP-MAP-RAC/SPA (2010) Overview of scientific findings and criteria relevant to identifying SPAMIs in the Mediterranean open seas, including the deep sea. RAC/SPA

