United Nations Environment Programme
MEDITERRANEAN ACTION PLAN
Regional Activity Centre for Specially Protected Areas

ACTION PLAN
FOR THE CONSERVATION OF CETACEANS
IN SYRIA

Prepared by
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Consultants to the RAC/SPA

June 2008
Acknowledgements

The High Institute of Marine Research (HIMR) and the Ministry of Local Administration and Environment (MLAE) offered hospitality for this mission in Syria. Its success is largely due to the collaboration of Amir Ibrahim (HIMR), Akram Issa Darwish (MLAE) and Boutheina Jray (MLAE), who not only contributed their extensive knowledge but also organized and facilitated various meetings. Both institutions have demonstrated competence and great interest in cetacean research and conservation.

Our deepest gratitude goes to the experts, Authorities and fishermen who participated in meetings and/or interviews, answering to a number of questions and providing essential information.

Special thanks to Lobna Ben Nakla (RAC-SPA) for her invaluable assistance and advice.

Finally, we thank the Authors of previous Action Plans for cetaceans in the Mediterranean region, whose work provided inspiration and guidance.

About the Authors

Joan Gonzalvo has been collaborating with the Tethys Research Institute since 1999 and in 2007 he joined the Board of directors. Between years 2000 and 2005 he was member of GRUMM, the group for the study and conservation of marine mammals at the University of Barcelona, Spain. As a GRUMM collaborator he was involved in a study of interactions between bottlenose dolphins and fisheries funded by the Spanish Ministry for the Environment, and in a EU-funded project to assess bottlenose dolphin population size and conservation needs in the Balearic Islands. He was responsible for a bottlenose dolphin monitoring project in the Ebro river delta (north-eastern Spain) to evaluate the potential effects of the proposed construction of offshore wind farms. In 2006 he settled in Greece where he does year-round dolphin research in the Amvrakikos Gulf in the context of his Ph.D. with the University of Barcelona. Joan has lived for several years in London, where he earned his degree in Animal Biology.

Giovanni Bearzi has been doing research on Mediterranean dolphins since 1986, particularly in the Adriatic and Ionian Seas. He founded and directed for a decade a dolphin research and conservation programme in Croatia, that was awarded the ‘Henry Ford European Conservation Award’ as best European project overall. Giovanni has always tried to combine his scientific work with public awareness and education to support marine conservation, and he has supervised a number of students and young researchers. He holds a Ph.D. in zoology at the University of Basel, Switzerland, with a thesis on Mediterranean coastal dolphins. Since 1990 he has been a Board Member of the Tethys Research Institute and in 2000 he became the President of Tethys - a position he still holds. Between 2002 and 2006 he taught a course on Cetacean Conservation at the Faculty of Sciences, University of Venice, Italy. In 2001 he was awarded a Pew Marine Conservation Fellowship.
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Executive summary

Formulation of management measures is made difficult by the present lack of information on cetacean species composition, distribution, ecology, population parameters and trends in Syrian waters. Consequently, capacity building and research were seen as priorities for the immediate future.

Many of the factors likely to represent threats to cetacean populations in Syrian waters derive from unsustainable and growing human impact. Conservation of cetaceans in Syria depends on the political will to take responsible and timely action to prevent damage to marine biodiversity. Honouring existing obligations with regard to the management of fisheries, pollution and other forms of habitat degradation represents an important step to ensure a favourable status to cetacean populations.

In addition to recommending compliance with existing obligations, this Action Plan envisages and outlines feasible and relatively simple actions divided into four broad categories: Education and awareness, Capacity building, Research, and Management. All categories are equally important and the corresponding actions will have to be implemented simultaneously.

Actions outlined in this Plan should be implemented in view of obtaining measurable results within three years. The proposed actions are intended to pave the way for the future establishment of networks of Marine Protected Areas, designed on the basis of appropriate information on cetacean ecology, distribution, long-range movements and spatial needs.

The Plan shares the view expressed by the Parties to the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area that "diffusing research and monitoring abilities throughout the region is a timely challenge and one of the highest priorities as far as cetacean conservation is concerned" (ACCOBAMS 2002). Accordingly, the Plan outlines actions aimed to address individual and institutional capacity building.

Public awareness and education also represent essential parts of this Plan, as they create a favourable ground for conservation-oriented management. The Plan highlights the need to conduct campaigns based on well-defined public awareness strategies, and identifies a series of actions targeting managers, teachers, school children and the general public.

The Plan also recommends that Institutes and organizations (whether governmental or non-governmental) and individuals capable of providing qualified professional service be regarded as relevant actors in the cetacean conservation process. The High Institute of Marine Research of the Tishreen University at Lattakia was proposed as a key player in the future development of research and conservation action.
Introduction

The conservation status of Mediterranean cetaceans has been a source of concern for many years. This was reflected in the global action plans for cetacean conservation published by the IUCN (International Union for Conservation of Nature) in 1988, 1989, 1994 and 2003.

In 2006, the IUCN Red List Authority and ACCOBAMS organized a workshop to assess the status of cetacean populations in the Mediterranean and Black Seas (Reeves and Notarbartolo di Sciara 2006). Of the 12 ‘units’ assessed, one was proposed to qualify for Critically Endangered, five for Endangered and two for Vulnerable (Fig. 1). The other four were considered Data Deficient, meaning that there was inadequate information to assess their extinction risk.

<table>
<thead>
<tr>
<th>Species / subspecies</th>
<th>Unit</th>
<th>IUCN criterion</th>
<th>Status</th>
<th>Notes</th>
<th>Assessor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Killer Whale</td>
<td>Strain of Gibraltar</td>
<td>CR C2a(i,ii) D</td>
<td></td>
<td>Killer Whales in the Mediterranean were not assessed and are included in the “Visitor species” section</td>
<td>Cañadas and de Stephanis</td>
</tr>
<tr>
<td>Organus arca</td>
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<td>EN C2a(i)</td>
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<td>Notarbartolo di Sciara, Frantzis, Bearzi and Reeves</td>
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<tr>
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<td>subpopulation</td>
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<td>VU A2cde</td>
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<td>Striped Dolphin</td>
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<tr>
<td>Harbour Porpoise</td>
<td>Black Sea</td>
<td>EN A1d + A4cde</td>
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<td>Interpreted to include the animals in the northern Aegean Sea</td>
<td>Birkun and Frantzis</td>
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<td>subspecies</td>
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<td>Black Sea</td>
<td>EN A1d</td>
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<td>pongius</td>
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</table>

\(\downarrow\) Suspected decline

\(\uparrow\) Evidence of decline

\(\uparrow\uparrow\) Quantitative evidence of decline

? Insufficient information

Figure 1. Summary of the IUCN/ACCOBAMS assessment of the status of Mediterranean cetaceans (from Reeves and Notarbartolo di Sciara 2006).
The listing criteria in Fig. 1 have been fully adopted by the Parties to ACCOBAMS in 2007. The Parties - including Syria - were urged to implement measures to address the threats to cetacean populations, particularly in regard to endangered populations.

A cautionary note on Action Plans for cetaceans

Action Plans can be powerful conservation tools to protect cetacean populations, but they are rarely used and implemented. Scientific evidence, workshops, recommendations and even Action Plans may only sum up to ‘conservation on paper’ and it has been suggested that in some cases this may be a way of diverting from action and postponing the enforcement of meaningful conservation measures (Bearzi 2007). Unless followed by concrete action, cetacean Action Plans may only serve for green-washing purposes, rather than to support conservation.

The Conservation Plan for short-beaked common dolphins in the Mediterranean Sea (Bearzi et al. 2004b), for instance, has so far failed to produce significant action. Indeed, region-wide Conservation Plans are difficult to implement and financially challenging. Consequently, they tend to be perceived as wishful thinking in the specific Mediterranean reality.

Conversely, national Action Plans may be easier to implement as long as there is a clear commitment to protect marine biodiversity.

Such commitment - manifested and repeatedly expressed by Syrian Authorities and scientists - represents a promising ground for the full implementation of the actions proposed here.

Marine Protected Areas as a conservation tool

In a marine environment such as the Mediterranean, where human impact is so pervasive, even though it is illegal to deliberately kill cetaceans, Marine Protected Areas (MPAs) ensure a greater protection to the animals and alleviate human encroachment. MPAs may restore ecosystem functioning and benefit marine food webs by providing shelter to threatened marine species, thus contributing to the recovery of depleted dolphin prey (Agardy 1997; Roberts et al. 2001; Guidetti and Sala 2007). MPAs provide an ideal framework to conduct robust scientific investigations and ecosystem studies, and combine them with socio-economic analyses and other management-oriented assessments.

If appropriately managed, MPAs can contribute to cetacean conservation by preserving their prey and habitat, reducing the risks of mortality in fishing gear, providing ‘refuge’ from noise and other types of disturbance, raising awareness, stimulating research and facilitating exchange of information (Hoyt 2005; Notarbartolo di Sciara 2007).

About 100 MPAs of different types, sizes and purposes have been established in several Mediterranean countries (Bearzi et al. in press), but specific measures for cetacean conservation are rarely included in their management plans. The existing and proposed MPAs for whales and dolphins in the region are shown in Fig. 2.

Most cetacean species are highly mobile and their presence may vary on a seasonal or annual basis. MPA designation based on insufficient knowledge may not represent the most effective conservation strategy to protect these animals, although MPAs can help to protect ecologically important portions of their range. The success of MPAs as tools for cetacean conservation will depend on our ability to match the animals’ critical habitat and/or resources with the boundaries of the areas to be protected. Therefore, to be effective for cetacean conservation, the design of MPAs should be based on a good understanding of the movements and spatial needs of both the animals and their prey.
Applying targeted management measures to areas identified through research as having special conservation importance for cetaceans may be more appropriate (and certainly more expeditious) than establishing “traditional” MPAs with static boundaries. Such an alternative strategy is particularly advantageous considering 1) the currently scarce knowledge on cetacean distribution and long-term movements in Syrian waters, 2) the inherently dynamic nature and likely large spatial extent of the habitat used by these animals year-round, and 3) the cumbersome institutional and governance issues affecting the design, enforcement and implementation of “traditional” MPAs.

Management action that can provide direct or indirect benefits to cetaceans include 1) area-, season-, or fishery-specific reductions in fishing effort, 2) changes to fishing gear or fishing practices to reduce incidental mortality, 3) curtailment of inputs of toxic pollutants, and 4) boating and shipping regulations. As many of these management strategies are already embedded in legislation and treaties ratified by Syria (see “Legal framework”), compliance with those existing commitments and obligations should be given high priority.

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**Figure 2.** MPAs for Mediterranean and Black Sea cetaceans proposed by ACCOBAMS (map by Lesley Frampton and Erich Hoyt / WDCS). The already established Pelagos Sanctuary and the Cres-Losinj Special Marine Reserve are shown in blue.
Building capacity and promoting awareness

The challenge of creating capacity

The Parties to ACCOBAMS recognised that "diffusing research and monitoring abilities throughout the region is a timely challenge and one of the highest priorities as far as cetacean conservation is concerned" (ACCOBAMS 2002). It was also noted that "the problem to be addressed is twofold: 1) transmitting knowledge through appropriate, effective and long-lasting training procedures, and 2) ensuring that such hard-gained knowledge is put to good, long-term use once the trainees endeavour to apply it at home".

Although opportunities to get professional training in cetacean research techniques and learn about cetacean conservation and management strategies are currently increasing in some Range States, particularly in the north, such opportunities are still scarce or lacking in most portions of the region, including Syria. Consequently, scientists as well as public administrators, managers and teachers can seldom rely on appropriate training for their professional growth, which prevents the development of sound research programmes and conservation campaigns.

Poor access to information is another problem. Much of the specialized cetacean literature can be hard to access, as cetacean libraries in the Mediterranean region are rare or privately held. Also, opportunities for learning are scarce, due for instance to limited local expertise, limited contacts with other researchers, generally low activity levels in this field, and the fact that professional cetacean conferences are rarely held in some Mediterranean Range States.

Facilities where professional work on cetaceans can be conducted are still scarce in most Mediterranean countries, thus weakening the potential of local researchers. Finally, low budgets and travel difficulties can result in cultural isolation and greater challenges to developing and carrying out cetacean research and conservation programmes.

On the other hand, Mediterranean areas where cetacean science and conservation are still relatively "undeveloped" have responded favourably to cetacean conservation initiatives. In these areas, the need exists for capacity building programmes and cross-border collaboration.

This Action Plan recognises the need to address two aspects of this issue: individual capacity building, and institutional capacity building. Individual capacity can be built in several ways. A formal approach to theoretical education would include seminars, workshops, short-term training courses and University courses on cetaceans. A different, more practical approach may include direct involvement of the trainee through volunteering, assistantships and internships. A combination of the theoretical and practical approaches is probably optimal. An example would be intensive training courses in the field, where lectures involving theory are combined with direct experience at sea collecting data.

Another approach concerns institutional capacity building. Creating institutional capacity ensures that the resources invested in individuals are not wasted, by providing them with actual working opportunities, access to information, and a favourable environment in which they can grow professionally. These would involve such things as creating University courses, managing literature collections, opening laboratories and other infrastructure, facilitating access to information, and providing logistic and other support to institutions that may offer positions to deserving individuals.

Institutional capacity building concerns inter alia the provision of professional training to public administrators and bodies in charge of the management of Marine Protected Areas, research and teaching organisations, and advocacy organisations.

The importance of awareness and education

Public awareness and education create a favourable ground for conservation-oriented management action. Even thorough scientific information and science-based management measures will fail to meet their final conservation objectives if there is poor awareness among the public on the need to protect biodiversity and natural resources. Implementation by local Authorities may be neither feasible nor effective in the absence of
public will and consensus, when it comes to regulating the behaviour of people who are not aware of the importance of protecting the natural environment.

As long as people are not made aware that whales and dolphins are present in their local waters, that the animals’ existence is threatened and that there are reasons to protect these animals, they are not likely to support recovery efforts. People need to care, and caring largely derives from understanding linkages and processes. Explaining such linkages and processes (e.g. through a direct involvement of the public or by means of carefully designed public awareness campaigns) must be seen as an essential component of conservation efforts.

Public awareness and education represent an important part of this Action Plan. Fishermen must be viewed as a key audience, because they are among the people likely to interact most directly and most frequently with cetaceans. At the same time, it is important to reach members of the general public, as they are consumers of fishery products and the ultimate arbiters of public policy (via the democratic process).

A strategy for public awareness

A few suggestions for developing awareness campaigns are listed below, based on Bearzi et al. (2004b):

- Try to convey the cetacean conservation message in a positive way (e.g. “cetaceans can be protected”), rather than spreading exclusively negative information (e.g. “cetaceans are vanishing”); the audience should be informed that whales and dolphins still live in Mediterranean waters, and that there is reason to hope that their decline can be stopped and their recovery facilitated.

- Although a portion of the general public may see whales and dolphins as “flagship species” (i.e. species that appeal to the public and have other features that make them suitable for communicating conservation concerns), when communicating to portions of the public that do not show special concern for these animals it may be more effective to present them as valuable resources (e.g. for improving the tourist profile of an area), and/or as essential components of ecosystems whose biodiversity must be preserved (e.g. to maintain their resilience or ecological integrity).

- A rich and diverse natural environment is a treasure to be preserved for our own benefit and for that of future generations; marine environments where whales and dolphins still live have aesthetic value and may attract visitors who want to enjoy them; this can allow for multiple uses that ultimately bring economic benefits (e.g. from a combination of responsible fishing, tourism, and whale watching with its direct and induced income).

- It is virtually impossible to protect cetaceans without preserving the environment they live in.

- The animals should be shown as closely as possible to what they really are; they should be presented as components of ecosystems that are complex, interrelated and vulnerable.

- Show positive examples of people (scientists, students, fishermen, managers etc.) who have enriched their life and found personal satisfaction by choosing to contribute to marine conservation; such positive examples can also be found among communities that have benefited from an enlightened management of the marine resources.

- Encourage people to get involved; show them that getting personally engaged is both feasible and personally rewarding; indicate practical ways of contributing to cetacean conservation.

Personal experience and direct contact with conservation scientists and other motivated people engaged in conservation initiatives are often instrumental in making the public susceptible to a conservation message. Communication between the public and experts active in cetacean conservation should be encouraged, as positive personal examples are more likely to attract interest and be taken as models than abstract concepts or impersonal information.

It is important to stress that, whenever possible, communication should not be mono-directional. Communication brings more long-lasting results when both sides are listening to each other, and try to adapt...
their message and strategies accordingly. This is particularly important when addressing stakeholders (e.g. fishermen, tourist operators etc.) who may be directly affected by cetacean management actions.

**Context of this Action Plan**

Between the 1st and the 6th of March, 2008, a mission to Syria was organized and funded by the Regional Activity Centre for Specially Protected Areas (RAC/SPA) to collect information for the preparation of an Action Plan for the conservation of cetaceans.

The General Commission for Environmental Affairs of the Syrian Ministry of Local Administration and Environment helped with the organization of meetings with relevant Authorities that were consulted for the elaboration of the present document.

The High Institute of Marine Research (HIMR) of the Tishreen University at Lattakia acted as guest institution, offering generous hospitality and providing facilities and personnel to support the mission.

Several meetings were held with personnel from HIMR, Syrian Port Authorities, Syrian Fisheries Department, Directorate of Water Quality Control, Prefecture of Lattakia, as well as with members of Fishermen Cooperatives at the ports of Yugoslavia (Lattakia), Banias, Arowad Island and Ras Al-Basit. Experts involved in these meetings are listed in Annex 1.

Four days of meetings, visits to fish markets and interviews with local fishermen produced information that would have been difficult to obtain otherwise and provided a background for the preparation of this Plan. The mission also shed light on the present level of local expertise and on the available equipment and facilities.

**Background information**

**The Syrian fishery fleet**

According to Syria’s General Directorate of Ports (responsible for the management and monitoring of fisheries) the Syrian fishing fleet is composed of about 2,000 “artisanal” fishing boats using various gear (e.g. gillnets, trammel nets, longlines). It also includes 55 purse seiners (working at night with lamps and targeting epipelagic fish) and 25 bottom trawlers.

From 2005, Syrian bottom trawlers are only allowed to fish in international waters (Ministerial Decree No. 15/T of March 19th, 2004). Trawling within the 12 nm of Syrian territorial waters was banned since the Syrian Government acknowledged the decline in catch per unit effort, and decided to prevent further damage to the marine environment (including declining seagrass beds, Marttin et al. 2006).

The “artisanal” fleet is a multi-species fishery with multipurpose vessels ranging from 3 to 15 m of length, operating a wide variety of gear. The greatest concentrations of these boats was found in Lattakia and Arowad Island.

Beach seining is illegal in Syrian waters since January 2004 (Ministerial Decree No. 54/T of May 31st, 2003).

**Cetacean records**

Twenty-one species of cetaceans occur in various degrees of abundance in the Mediterranean Sea. Eight are considered regular (fin whale, sperm whale, Cuvier’s beaked whale, long-finned pilot whale, Risso’s dolphin, common bottlenose dolphin, short-beaked common dolphin and striped dolphin) while all others are visitors or vagrant (Reeves and Notarbartolo di Sciara 2006).
In March 2006, experts from the IUCN Cetacean Specialist Group, ACCOBAMS and the RAC/SPA assessed the status of cetacean populations living in the Mediterranean and Black Seas (Reeves and Notarbartolo di Sciola 2006, and see Fig. 1). In the resulting report, 7 of the 8 regular Mediterranean species were considered native in Syrian waters; the long-finned pilot whale was regarded as possibly vagrant there. The occurrence of these species in Syria was probably inferred based on their presence in adjacent Mediterranean waters, rather than based on confirmed record.

Information on the cetacean species occurring off Syria is extremely scarce and limited to a handful of stranding and sighting records. A summary of the available information on species found stranded or observed at sea is given in Table 1. Stranding events and photographic documentation recorded by Dr. Amir Ibrahim and HIMR researchers since 2002 were reviewed during the mission to Syria organized in the context of this Action Plan. In some cases, identification was confirmed based on photos made available by Dr. Amir Ibrahim and his research group (Table 1, Annex 2).

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Species</th>
<th>Source / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 Jun 1991</td>
<td>A few km south of Lattakia</td>
<td>Pc</td>
<td>Skull found on the beach; Kasparek, 1997.</td>
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<tr>
<td>12 Mar² 2003</td>
<td>Tartous (Hosien Al Baher)</td>
<td>Mn</td>
<td>Stranded dead, male, 785 cm; Saad 2004, Ikhtiyar and Ibrahim in press.</td>
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<tr>
<td>11 Mar 2005</td>
<td>Al Basin - Om Altiour</td>
<td>Zc</td>
<td>Stranded dead, male, 495 cm; identification by HIMR; identification confirmed by Authors of this Plan based on photos provided by Dr. Amir Ibrahim and his research group.</td>
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<tr>
<td>18 Apr 2005</td>
<td>Tartous Beach</td>
<td>Pm</td>
<td>Stranded dead, 1045 cm; identification by HIMR; identification confirmed by Authors of this Plan based on photos provided by Dr. Amir Ibrahim and his research group.</td>
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<tr>
<td>April-May 2005</td>
<td>Borj Islam</td>
<td>Zc</td>
<td>Stranded dead; inspection by HIMR; identification confirmed by Authors of this Plan based on photos provided by Dr. Amir Ibrahim and his research group.</td>
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<tr>
<td>24 Jul 2006</td>
<td>Jableh</td>
<td>Tt</td>
<td>Stranded dead, female, emaciated, clear evidence of bycatch in longline (ingested hook with protruding line); inspection by HIMR; identification confirmed by Authors of this Plan based on photos provided by Dr. Amir Ibrahim and his research group.</td>
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<td>8 Oct 2006</td>
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<td>Floating adrift, male, tied with a rope, possibly after bycatch; inspection by HIMR; identification confirmed by Authors of this Plan based on photos provided by Dr. Amir Ibrahim and his research group.</td>
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<tr>
<td>7 Apr 2007</td>
<td>Harbour of Banias</td>
<td>Tt</td>
<td>Stranded dead, 315 cm, old age (based on worn-out teeth); identification by HIMR; identification confirmed by Authors of this Plan based on photos of mummified animal provided by Dr. Amir Ibrahim and his research group.</td>
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<tr>
<td>16 Apr 2007</td>
<td>Tartous (Alhamidia)</td>
<td>Tt</td>
<td>Stranded dead, male, 176 cm: identification by HIMR.</td>
</tr>
<tr>
<td>4 May 2007</td>
<td>Iben Hani</td>
<td>Tt</td>
<td>Stranded dead, 223 cm, likely killed by a large propeller (deep parallel cuts on the body, half of the tail flukes cut away); inspection by HIMR; identification confirmed by Authors of this Plan based on photos provided by Dr. Amir Ibrahim and his research group.</td>
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<tr>
<td>3 Mar 2008</td>
<td>Rmielah</td>
<td>Zc</td>
<td>Stranded dead, 290 cm (very young female), shark bites (likely post-mortem); inspected by HIMR personnel together with Joan Gonzalvo.</td>
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</tbody>
</table>

Table 1. Cetacean records along the Syrian coast (1991-2008). Pc = Pseudorca crassidens; Zc = Ziphius cavirostris; Mn = Megaptera novaengliae; Pm = Physeter macrocephalus; Tt = Tursiops truncatus.

¹ March 12th, 2003 is the correct date of the stranding according to Dr. Amir Ibrahim. Dates published elsewhere should be considered incorrect.

In addition to the information in Table 1, Foulquié and Dupuy de la Grandrive (2003) reported the following two observations: 1) one sighting of a lone bottlenose dolphins made in October 2002 (date not reported) a few hundred meters off Um Tiur, and 2) one sighting of a lone short-beaked common dolphin on October 1st, 2002, off Ras Al Bassit. The reliability of this information is hard to assess and the report itself expresses doubts with regard to correct identification.

Furthermore, undocumented encounters with fin whales in offshore waters were reported by local fishermen. Short-beaked common dolphins and striped dolphins were also claimed to occur. As identification of small dolphins at sea is sometimes difficult even for the specialist, and these two species may be mistaken, undocumented reports should be taken with caution.

**Main points emerged from interviews with fishermen**

Interviews to fishermen during informal visits to fishing ports offered preliminary insight on the occurrence of cetaceans in Syrian waters and on the degree of interactions between dolphins and fisheries.

To assist with species identification during interviews and gatherings, photographs and drawings of cetacean species were displayed using a marine mammal guide, a poster in Arabic (Fig. 3), and photographs displayed on a laptop screen.

**Figure 3.** Poster “Cetaceans of the Mediterranean and Black Seas” in Arabic, used for species identification during interviews.

**Port Yugoslavia, Lattakia (N = about 10 fishermen)**

- Fishermen reported clear evidence of overfishing. Catches keep decreasing, as do average fish sizes. Increasing captures of juveniles and immature specimens.
- Dolphins seen often but not regularly. Fishermen do not seem upset or worried about gear depredation by dolphins.
- No aggressive attitude towards dolphins. Fishermen mainly worry about overfishing. Dolphins described as pleasant animals and also as indicators that there is still some fish left in the area.
Manifest incapacity to distinguish among some dolphin species. The majority of fishermen point at bottlenose dolphins as the most regular species in coastal waters and the one more frequently involved in interactions with coastal fisheries. When referring to sightings occurring farther offshore the fishermen manifested doubts between short-beaked common dolphins and striped dolphins. Groups of offshore dolphins could include over 100 animals.

Albeit complaining about overfishing, artisanal fishermen did not report direct competition with industrial fisheries (10 purse seiners are based in Port Yugoslavia). They explained that purse seines target epipelagic fish, while they target demersal species.

**Banias (N = 7 fishermen)**
- Fishermen reported decreasing catches and average fish sizes. Although overfishing reportedly occurs, declining landings were thought to be caused by pollution and more specifically by the oil industry. The large majority of coastal waters was reported to be polluted.
- Main target species include red mullet *Mullus sp.* and European hake *Merluccius merluccius*. Declining catches of these species were thought to be related to declining sardines and other epipelagic fish.
- More control needed on illegal activities, particularly incursions of trawlers into Syrian waters and dynamite fishing.
- Dolphins are seen as a big problem. Gear depredation and damaged fish were often related to dolphin presence around the nets. Bottlenose dolphins were the species blamed for such interactions.
- Higher reported net damage and depredation when targeting red mullet.
- Besides these complaints, there were claims that catches may increase due to dolphins herding fish into the nets.
- Fishermen claimed that dolphins cannot be killed as the law protects them.
- Fishermen receptive to the possibility of experimenting pingers (acoustic deterrent devices) to reduce damage to fishing gear. Willing to collaborate and bring observers on board if such experimentation is conducted in the future.
- Three areas were reported as having a high density of dolphins: Saukas, El Kharab and El Basia.
- Either short-beaked common dolphins or striped dolphins encountered farther offshore. No sightings of large cetacean species were reported.

**Arawad Island (N = 3 fishermen)**
- Fish captures decreasing steadily over the past 20 years because of overfishing and pollution.
- Occasional illegal use of dynamite for fishing.
- Bottlenose dolphins often encountered at about 50 m of depth, and occasionally very close to shore.
- Reports of occasional gear damage and depredation by dolphins.
- Smaller dolphin species (either short-beaked common dolphins or striped dolphins) seen farther offshore, occasionally feeding with large tuna.
- Between September and October, fin whales were claimed to be found about 8 nm offshore. Reports referred to fin whale groups rather than single individuals.

**Ras Al Bassit (N = 8 fishermen)**
- Main problems faced by fishermen included overfishing, gear damage and depredation by dolphins and pollution.
- Occasional illegal use of dynamite for fishing.
- Main species caught include European barracuda *Sphyraena sphyraena*, European hake *Merluccius merluccius* and red mullet *Mullus sp.* Catches reportedly decreasing, as do average fish sizes. Fishermen working with longlines claim that 10 years ago swordfish *Xiphias gladius* averaged 100 kg - today's catches rarely weight more than 50 kg.
- Bottlenose dolphins seen often in coastal waters shallower than 100 m.
- Bottlenose dolphins reported to cause damage to fishing nets.
Fishermen receptive to the possibility of experimenting *pingers* (acoustic deterrent devices) to reduce damage to fishing gear. Willing to collaborate and bring observers on board if such experimentation is conducted in the future.

Striped dolphins reported to be often seen in large groups in offshore waters.

Reports of occasional sightings of large whales close to shore (fishermen were not sure about the species involved - possibly sperm whales).

**Possible threats to cetacean populations**

Lack of information on cetacean species composition, ecology, distribution and population parameters in Syrian waters hampers evaluation of anthropogenic impact.

Operational interactions between coastal dolphins and fisheries have resulted in conflict in some Mediterranean areas (Reeves *et al.* 2001; Bearzi 2002; Lauriano *et al.* 2004; Gazo *et al.* 2008). Syrian fishermen consistently identified bottlenose dolphins as the species involved in gear damage and depredation. Intentional killing of dolphins in retaliation may occur, but remains conjectural.

Incidental entanglement in fishing gear, a major source of mortality for Mediterranean cetaceans (Bearzi 2002; Tudela *et al.* 2005), has not yet been documented in Syrian waters. Although fishing methods such as midwater trawling or driftnetting (often involved in cetacean mortality events) are not in place, incidental takes of cetaceans in other fishing gear are likely to occur.

Unsustainable fishing has been implicated in dramatic ecological changes in the Mediterranean Sea (Sala 2004), causing the decline of many fish stocks (Garcia *et al.* 2005). Prey depletion resulting from fishery overexploitation may represent an important threat to Mediterranean cetaceans, and particularly for dolphins living in or near coastal waters (Bearzi *et al.* 2003, 2004a, 2006, in press). Depletion of marine resources caused by overfishing was consistently lamented by artisanal fishermen as well as by Syrian Authorities. Damage to the marine environment reportedly also derives from the illegal use of dynamite for fishing and from illegal trawling in Syrian territorial waters by foreign fleets.

High concentrations of heavy metals, organochlorines and other contaminants were found along the Syrian coast (Othman *et al.* 2000; Kayyal 2005). Four major cities along the Syrian coast - Latakia, Tartous Jableh and Banias - have a combined population of over 800,000 people. In most cases, sewage and other discards are dumped into the sea without treatment. Industrial development in this part of the Mediterranean is causing increasing pollution, particularly around industrial complexes such as the Banias oil refinery, the Tartous cement plant, the phosphate loading dock at the Port of Tartous, the two oil terminals of Banias and Tartous, and the thermal power station in Banias. High density of industrial settlements along the 183 km of Syrian coastline have an unknown but potentially high impact on the marine environment. Personnel from the Department of Water Quality Control reported that 17 new sewage treatment plants will be created in 2008, including in Lattakia.

Ship strikes represent one of the main anthropogenic threats for Mediterranean fin whales (Panigada *et al.* 2006). Following development of the ports of Lattakia, Banias and Tartous, ship traffic has increased considerably. According to the General Directorate of Ports, in 2007 over 4,000 large commercial ships moored at the ports of Lattakia and Tartous. Therefore, a risk of collision with fin whales (reported to occur off Syria) may exist. Noise pollution resulting from shipping may represent another threat. A further reason of concern is represented by the risk of oil spills due to intense traffic of oil tankers. For instance, traffic to the refinery of Banias in 2007 involved 351 tankers.
Legal framework

Conventions, agreements and protocols ratified by Syria, which are relevant for cetacean conservation, include:

- Agreement on the Conservation of Cetaceans of the Mediterranean Sea, Black Sea and contiguous Atlantic Area (ACCOBAMS)
- Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, also known as the Barcelona Convention
- Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, also known as the “SPA and Biodiversity Protocol”
- Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas
- Convention on Biological Diversity, or CBD
- Bonn Convention on the Conservation of Migratory Species of Wild Animals, or CMS
- Convention on the International Trade in Endangered Species of Wild Fauna and Flora, or CITES
- The African-Eurasian Migratory Water-birds Agreement, or AEWA
- Cartagena (Bio-safety) Protocol
- The Ramsar Convention on Wetlands.

The careful observance of the various obligations embedded in these instruments would generate enormous advantages for the marine environment, and grant of a favourable conservation status of cetaceans. Their full enforcement is therefore of great importance.

Syria is also a Member of the General Fisheries Commission for the Mediterranean (GFCM), and of the Mediterranean Science Commission (CIESM).

While Syria is a Party to ACCOBAMS since 2002, there is no Syrian law that refers specifically to the protection of cetaceans. An "Aquatic Organisms Law" is currently being reviewed and is expected to be approved by 2008. The new draft of this law includes a specific article for the protection of cetaceans.

An Environmental Law ratified by the President of Syria in 2002 (Law No. 50) allows for the establishment of Specially Protected Areas, managed by the General Commission for Environmental Affairs (Directorate for Biodiversity and Protected Areas). One marine protected area has been established so far in Syrian coastal waters. The Fanar Ibn Hani MPA, with a total area of 10 Km², was designated in year 2000 under Resolution No. 26/T (Fig. 4).
Figure 4. Location of Fanar Ibn Hani Marine Protected Area.
ACTIONS

It is recommended that actions outlined in this Plan are undertaken immediately and implemented in view of obtaining measurable results within three years from the adoption of the Plan. An assessment of progress is recommended at the end of each year.

Several Action Plans have been produced for cetaceans and other species, some of which have resulted in rather modest implementation and conservation benefits (see "A cautionary note on Action Plan for cetaceans"). The implementation process of this Plan must be carefully monitored in order to ensure that the proposed measures are effectively turned into actions and that these ultimately result in valuable scientific information and bring benefits to cetaceans living in Syrian waters.

As the actions outlined in this Plan are numerous and diverse, it is important to accomplish them in a coordinated and expeditious manner. Proper implementation ideally requires a dedicated position, that should be filled by a person with strong commitment, significant scientific training in biology, excellent management and organizational skills, and strong interpersonal talents. Such person may coordinate the implementation of all aspects of the Plan, in coordination with Syrian Authorities and institutes, as well as with the RAC/SPA and the ACCOBAMS Secretariat.

The implementation of this Plan will require a wide range of expertise that is scattered throughout the region. The involvement and coordination of a diverse network of experts and organizations capable of engaging in the actions outlined here are key to success. It is recommended that non-Syrian organizations and experts be involved in this Action Plan to share their expertise with local scientists. Both governmental and non-governmental Institutes and organizations, as well as individual experts, should be regarded as relevant actors.

This Plan may be subject to modifications as indicated by input from Syrian and other experts, new findings, changes in species status and completion of implementation tasks.

HIMR was selected as one of the main actors and targets. This research centre has personnel, facilities and -more importantly - commitment and interest towards cetacean conservation. Implementation of this Action Plan will ensure that HIMR pioneers cetacean research and conservation in Syria, promoting the creation capacity among students and raising public and institutional awareness.

Identification of HIMR as the main target of this Action Plan does not imply that action will remain confined there. Several Ministries will play equally relevant roles and their collaboration is essential for the success of the Plan. The concerned Ministries include:

- Ministry of Local Administration and Environment
- Ministry of Transport – General Directorate of Ports
- Ministry of High Education
- Ministry of Agriculture and Agrarian Reform

Involvement of the first Syrian conservation NGO, the Syrian Society for the Conservation of Wildlife, established in 2005, is also essential. SSCW is a Partner to ACCOBAMS since 2007.

The actions outlined in this Plan were grouped into four categories:

1. Education and awareness
2. Capacity building
3. Research
4. Management
1. Education and awareness

1.1. Production of materials for public awareness and education purposes

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raise interest among the general public towards cetaceans and their conservation needs.</td>
<td>Make available a variety of materials to be used during seminars, training courses and awareness-raising events.</td>
</tr>
</tbody>
</table>

**Description**

Some educational materials in Arabic have recently become available. These include *inter alia* a poster on cetaceans of the Mediterranean and Black Seas (Fig. 3) and educational booklets for children. However, more materials would be needed to support awareness and education initiatives in Syria. These include videos, books on Mediterranean cetaceans, information brochures, recordings of cetacean sounds, educational children games and other materials for public display that can be used during public awareness events and presentations. Such materials may be specifically designed and targeted to the Syrian public by organizations with appropriate expertise, working in collaboration with HIMR. HIMR can then ensure distribution of these materials to other organizations and institutes concerned with environmental education.

**Possible actors**

HIMR, WDCS, RAC/SPA, ACCOBAMS.

**Target**

SSCW, organizations and institutes concerned with environmental education.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>24 months</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,000 €</td>
</tr>
</tbody>
</table>

1.2. Facilitate the reporting of cetacean strandings

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage the collection of cetacean stranding data and ensure increased reports of stranding events and incidental takes of cetaceans by people in coastal areas.</td>
<td>Design and distribute flyers and stickers to let people know what to do in case they find a stranded cetacean. Develop an information network and make available a phone number (ideally 24 h/day) to report stranding events.</td>
</tr>
</tbody>
</table>

**Description**

1) Identification of an existing 24 h/day emergency call centre structure that could be in-charge of collecting reports of cetacean strandings, and reporting them to HIMR (that should be unambiguously identified as the institution responsible for the collection and management of stranding data along the Syrian coast). 2) Production of materials to encourage the reporting of cetacean strandings to the call centre, e.g. a flyer with information on what to do in the event of a cetacean stranding (either dead or alive), a wallet-size tear-off card with phone number to report such events, stickers with logo and phone number of the cetacean stranding network, a small poster to be displayed on walls and notice boards. 3) Dissemination of these materials among fishermen cooperatives, Port Authorities and marinas. 4) Identification of a non-financial reward to encourage reporting, of a kind that would not encourage harm to cetaceans (e.g. a small gift, a booklet etc.). 5) Organization of meetings between HIMR personnel and Port Authorities and fishermen representatives as well as dedicated events to launch this initiative.

**Possible actors**

HIMR with supervision from ACCOBAMS and the RAC/SPA.

**Target**

Port Authorities, Coast Guard officers, fishermen, tourist operators, people living in coastal areas.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3-month kick off, then long-term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000 €</td>
</tr>
</tbody>
</table>

2 The actions listed in this section are consistent with the Education Programme developed by ACCOBAMS together with WDCS. It is recommended that these actions are conducted in the context of a collaborative effort between the concerned actors and ACCOBAMS/WDCS.


[http://www.cetaceanalliance.org/dolphinfriends/](http://www.cetaceanalliance.org/dolphinfriends/)
### 1.3. Design and conduct awareness actions targeting the fisheries sector

<table>
<thead>
<tr>
<th><strong>Objective</strong></th>
<th><strong>Action</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Involve fishermen and make them aware of the importance of preserving healthy marine ecosystems. Emphasize the role played by fishermen in the sustainable management of marine resources.</td>
<td>Oral presentations and informal talks targeting fishermen cooperatives. Round tables to promote exchange of information between fishermen representatives and marine conservation biologists.</td>
</tr>
</tbody>
</table>

**Description**

Fishermen, as key players of the marine conservation process, must be motivated to respect the law by getting them to understand that existing regulations are meant to maintain healthy fish stocks and preserve fishery resource as well as marine biodiversity and fishing as a Syrian cultural heritage. Charismatic and respected fishermen, whether retired or still working, should be identified and involved in the communication process. They should be empowered and motivated to work side by side with marine conservation experts who will act as spokespersons and facilitators at meetings (whether formal or informal). Intensive communication will be required in the initial phase. Once a relationship of mutual trust has been established with the fishermen community, occasional visits and contacts will ensure continuous exchange of information. A highly communicative, committed marine conservation biologists should be selected to lead this Action and develop a network of collaborators at fishing ports along the Syrian coasts. The involvement of conservation NGOs and volunteers is essential. For inclusion of cetaceans in the communication strategy, see “A strategy for public awareness”. This Action will provide opportunities to collect information on interactions between cetaceans and fisheries, in synergy with Action 3.2.

**Possible actors**

HIMR, SSCW.

**Target**

Artisanal and commercial fishermen, fishermen cooperatives and organizations.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months, then long term</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Indicative cost**

24,000 €

### 1.4. Dissemination of the series “Whales of the Mediterranean Sea” (Arabic version)

<table>
<thead>
<tr>
<th><strong>Objective</strong></th>
<th><strong>Action</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote cetacean research and conservation in the country.</td>
<td>Dissemination of the documentary series “Whales of the Mediterranean Sea” on DVD and/or VHF (as well as online).</td>
</tr>
</tbody>
</table>

**Description**

In 2008 earthOCEAN⁴ produced a series of documentary programmes featuring the work of scientists and conservationists to protect cetaceans in the Mediterranean Sea (see http://www.earthocean.tv). The series examines the threats faced by individual species, and focuses on the people who are making a difference to preserve the animals. This series has had great acceptance among very heterogeneous audiences and has proven to be a powerful tool for public awareness and education activities. The Arabic version of the series will appeal to a large audience in areas where there is an urgent need to raise interest on cetacean research and conservation. HIMR should facilitate the dissemination of the media throughout Syria.

**Possible actors**

EarthOcean, RAC/SPA, ACCOBAMS, HIMR.

**Target**

Authorities, education institutes, national media, general public.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 months</td>
<td></td>
<td></td>
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</tbody>
</table>

**Indicative cost**

8,000 €

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⁴ earthOCEAN specializes in the creation and production of environmental, science, and natural history based educational media. earthOCEAN.tv is an online education resource for students, teachers and the general public. It produces documentary videos and interactive content for online distribution, while producing longer format documentary films. earthOCEAN develops partnerships with and highlights the efforts of, international and local NGOs, conservationists and scientists to raise awareness in the media, in local communities, and around the world about environmental issues, to change attitudes and assist in policy development.
1.5. Creation of a small museum on cetaceans and other megafauna from Syria

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raise interest towards cetaceans and their conservation and provide information to interested people.</td>
<td>Creation of a permanent visitor centre on cetaceans and other charismatic megafauna living in Syrian waters.</td>
</tr>
</tbody>
</table>

**Description**

1) Identification of appropriate site, coordinator and experts to be involved. 2) Provision/preparation of materials. 3) Design and establishment of a small museum and information centre on cetaceans and other charismatic marine megafauna (e.g. sea turtles, elasmobranchs, pinnipeds, seabirds). Preparation and setting-up of the best-preserved and most appealing osteologic materials kept at HIMR (e.g. the humpback whale skeleton) will provide attractive features, to be complemented with 3D models, video and photographic materials and information boards on cetacean life history and conservation needs. The museum should be visually appealing (e.g. in terms of room design, lighting, ambient colours) and include interactive elements. Once established, the museum can be managed as an information centre where interested people can obtain information, for instance through a library on cetaceans and marine biology, interactive databases and other tools to facilitate cetaceans research. The museum will also provide a framework for the organization of educational events such as conferences and lectures on cetaceans and on the protection of the marine environment. Ideally, the museum should be created within or close to a marine biology research centre, to make it as lively as possible. The museum should aim to fascinate the visitor by presenting cetaceans and marine life as something visually and emotionally appealing, rather than merely display dead remnants from the past. Collaboration with international museums and consultancy by international experts will contribute to the success of this initiative.

**Possible actors**

<table>
<thead>
<tr>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syrian students and the general public.</td>
</tr>
</tbody>
</table>

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 months</td>
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<td></td>
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</tr>
</tbody>
</table>
2. Capacity building

2.1. Create capacity for the implementation of an effective cetacean stranding network

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve knowledge on cetaceans living off the coasts of Syria and the threats affecting them.</td>
<td>Provide training and materials to create expertise on the management of cetacean strandings.</td>
</tr>
</tbody>
</table>

**Description**

In 2004 ACCOBAMS organized a cetacean stranding workshop. However, follow-up is needed. A cetacean stranding expert may be contracted to visit the HIMR research station for an appropriate period of time, and offer specific consultancy aimed to 1) develop an appropriate cetacean stranding data-base and data collection forms, 2) design a standard protocol that takes into account the specific logistic and other constraints, 3) train local scientists on cetacean dissection techniques and the collection/preservation of tissue samples, and 4) contribute to the development of a cetacean stranding network (also see Action 1.2).

**Possible actors**

RAC-SPA, ACCOBAMS, experts competent in the management of cetacean stranding networks and in the collection, storage and preservation of cetacean tissue samples. The Universities of Padua (Italy) and Valencia (Spain) can contribute relevant expertise.

**Target**

HIMR personnel and any other scientist willing to contribute to the collection of cetacean stranding data.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 month</td>
<td>6,000 €</td>
</tr>
</tbody>
</table>

2.2. Create capacity in laboratory techniques

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve knowledge on cetaceans living off the coasts of Syria and the threats affecting them.</td>
<td>Organization of training courses on laboratory techniques for cetacean studies.</td>
</tr>
</tbody>
</table>

**Description**

HIMR has well-equipped laboratories that may be used for the analysis of cetacean tissue samples. To take advantage of such facilities, training courses could be organized abroad and in situ for selected Syrian scientist willing to commit to cetacean studies. The purpose of this Action is twofold: 1) show how the work is conducted under ideal conditions in well-managed professional laboratories, and 2) help Syrian researchers to take full advantage of existing instrumentation and facilities. Expert consultants may also provide guidance for the purchasing, set up and use of new equipment. An appropriate follow up will ensure that knowledge is put to good use.

**Possible actors**

Consultancy, supervision and follow-up: Experts in laboratory analyses of cetacean tissues, particularly in the fields of population genetics and toxicology. The Universities of Valencia, Barcelona (Spain) and Siena (Italy) can contribute relevant expertise.

**Target**

HIMR personnel and other interested scientists.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Duration + follow up</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 months</td>
<td>12,000 €</td>
</tr>
</tbody>
</table>
2.3. Create capacity in cetacean field research methods

**Objective**
Improve knowledge on cetaceans living off the coasts of Syria and the threats affecting them.

**Action**
Organization of training courses on field research techniques for cetacean studies for promising Syrian researchers.

**Description**
Field courses - ideally lasting for a minimum of 7 days - should include theoretical lectures and practical activities on topics such as species identification, individual photo-identification, survey methods, project design and management, database management, coordination of project personnel and logistical aspects related to a field research programme. Field courses should be organized in the context of existing research programmes in areas where cetaceans can be reliably found and weather conditions are optimal, to maximize chances for the trainees to get first-hand experience. Trainers should have appropriate expertise in field research methods and previous experience in the organization of training courses for multi-national teams. The trainees should be provided with appropriate follow-up materials, documentation and scientific literature.

**Possible actors**
Tethys Research Institute (Italy and Greece), Alnitak Marine Research Centre (Spain)

**Target**
HIMR personnel and other interested scientists.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>One week per course</td>
<td></td>
</tr>
<tr>
<td>Indicative cost</td>
<td>1,000 € per trainee plus travel costs</td>
<td></td>
</tr>
</tbody>
</table>

2.4. Provide selected Syrian researchers and students with opportunities for long-term training

**Objective**
Build capacity on cetacean research.

**Action**
Create opportunities for the long-term professional training in Universities and laboratories possessing relevant expertise in cetacean research.

**Description**
The Syrian Government offers research grants to students with an outstanding academic record. However, funding may not be appropriate for long-term training abroad. This Action envisages the establishment of a grant programme to support visits abroad, as well as the higher education of Syrian students and researchers determined to engage in cetacean research and conservation studies at Universities and laboratories abroad. Funding opportunities for such programmes should be created in the context of fellowships based on an appropriately unbiased selection system, aimed to ensure that only the truly skilled and committed will benefit from the programme.

**Possible actors**
Ministry of Higher Education, possibly in consultancy with organizations experienced in the management of marine research and conservation fellowship programmes.

**Target**
Selected Syrian researchers and students.

**Implementation Calendar**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>3-month development, then long-term.</td>
<td></td>
</tr>
<tr>
<td>Indicative cost</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>


3. Research

3.1. Conduct a survey of cetacean distribution in Syrian waters

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving knowledge on cetaceans.</td>
<td>Organize and conduct a cetacean survey in Syrian waters to assess species composition, distribution, abundance and critical habitat.</td>
</tr>
</tbody>
</table>

**Description**

It is recommended that Syria carries out this Action in the context of the ongoing initiative by ACCOBAMS to survey the whole Mediterranean basin to assess cetacean abundance and distribution. Appropriate coordination with the ACCOBAMS Secretariat and Scientific Committee would ensure an optimal use of the available resources and will be a key to success. This Action envisages the selection and use of an appropriate Syrian research platform (*). If local vessels are unavailable or their use in the context of this Action is logistically/financially cumbersome, authorizations should be facilitated for a foreign survey vessel to enter the territorial waters of Syria and conduct cetacean research. International experts should be involved in survey design, coordination and data analysis, consistently with the ACCOBAMS basin-wide survey initiative. Syrian researchers should participate in the survey, contribute their expertise and benefit from any opportunity to get additional training.

(*): HIMR owns a 16 m research vessel that is being renovated. When works will be completed this boat may represent an appropriate platform for cetacean research. The General Directorate of Ports owns a fully operational fleet and would be willing to collaborate pending a mandate by the Syrian Government.

**Possible actors**

ACCOBAMS, HIMR, General Directorate of Ports, selected Syrian researchers and students.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
</tbody>
</table>

3.2. Investigate operational interactions between cetaceans and fisheries

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand the level of conflict, assess economic damage to fisheries and impact on cetacean populations. Identify mitigation measures.</td>
<td>Conduct formal interviews to Syrian fishermen to assess the extent of dolphin-fisheries interactions (as well as indication of changes in the marine ecosystem).</td>
</tr>
</tbody>
</table>

**Description**

Design and execution of formal interviews at several fishing ports, covering the occurrence of fishing gear depredation and damage caused by dolphins and the occurrence of cetacean bycatch in fishing gear. Interviews should also investigate shifting environmental baselines with regard to sequential prey depletion and habitat degradation (present vs. past abundance of fish, fish size, and changes in ecosystem quality). These interviews will aim to obtain baseline information to design more detailed research projects in hotspots where cetacean density and/or the occurrence of interactions with fisheries reportedly are high. Supporting materials such as cetacean and fish guides, and photographs to facilitate species identification should be obtained. Collaboration should be sought from local fishermen cooperatives (also see Action 1.3.) to facilitate the interviews and get full collaboration from fishermen communities. A representative sample size should be obtained, with a homogenous distribution among fishing ports. This Action envisages the involvement of an international expert for interview design, protocol, training of interviewers and supervision.

**Possible actors**

HIMR, international consultant experienced in the study of interactions between cetaceans and fisheries.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
</tbody>
</table>

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As one generation replaces another, perceptions of what is natural change dramatically among local communities and memory of past ecosystem status is lost. In this context, interviewing different generations of fishermen is a valuable method to gain insight into shifting baselines and investigate sequential changes (Sáenz-Arroyo et al. 2005).
3.3. Promote the analysis and exchange of tissue samples from stranded cetaceans

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving knowledge on cetaceans.</td>
<td>Provision of cetacean tissue samples to existing tissue banks and exchange of information with the scientific community.</td>
</tr>
</tbody>
</table>

**Description**

As cetacean stranding events occur, the stranding network develops, and expertise becomes available (see Action 2.1), complete cetacean necropsies should be performed. Tissue samples should be sent in part to cetacean tissue banks such as the one managed by the University of Padua, Italy, or the University of Barcelona, Spain. More samples should be preserved in situ to perform additional analyses by local experts (see Action 2.2). Collaboration with laboratories and experts abroad, as well as training, will ensure that cetacean tissue samples and organs are properly collected, stored, and analyzed. This should ultimately result in the publication of relevant information in the scientific literature. Issues related to export permits for biological materials (e.g. under CITES) should be considered and the issuing of such permits should be facilitated.

**Possible actors**

HIMR, ACCOBAMS, Universities of Durham, U.K. (cetacean genetics), Padua, Italy (cetacean anatomy and pathology), Siena, Italy and Barcelona, Spain (cetacean toxicology) and Valencia, Spain (cetacean parasitology).

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
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</tbody>
</table>

3.4. Investigate the effects of fishing on marine food webs

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent overfishing and damage to marine food webs through appropriate management.</td>
<td>Analyze and review the available information on the impact of fisheries.</td>
</tr>
</tbody>
</table>

**Description**

Cetaceans are marine predators which status and survival depends on the availability of their prey and therefore on healthy marine food webs. Intensive fishing can disrupt the balance of marine ecosystems and result in the depletion of cetacean prey. As mismanagement will ultimately result in a collapse of the fisheries themselves, insightful science-based management of fishing is necessary to ensure long-term sustainability as well as protection of marine biodiversity.

Syria has recently improved its fisheries data collection system with support from the FAO MedFisis project. This Action envisages a comprehensive and independent analysis and evaluation of the available information, done by independent international experts in collaboration with Syrian fisheries scientists. This is expected to provide preliminary insight on the status and trends of Syrian fisheries and indicate whether fishing is sustainable. Evidence of longitudinal decline in catch per unit effort or average fish size, changes in catch composition (particularly to lower trophic levels) or other indicators of non-sustainability should lead to management changes (Action 4.2) and/or more specific research effort.

**Possible actors**

International and local fisheries experts, HIMR, Ministry of Agriculture and Agrarian Reform.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
</tbody>
</table>

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6 The Mediterranean Fishery Statistics and Information Systems (MedFisis) is a project that assists Mediterranean countries in improving their national fishery statistics and information systems. Based on national capacities, MedFisis aims to develop an information system of fisheries management at the regional level, which supports both the General Fisheries Commission for the Mediterranean (GFCM) and the countries participating in the project.

4. Management

4.1. Grant protection to cetaceans in Syrian waters

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure the full protection of cetaceans within the territorial waters of Syria.</td>
<td>Incorporate marine mammal protection in the Syrian legislation and ensure that any new article is appropriately worded.</td>
</tr>
</tbody>
</table>

**Description**
Although Syria is a Party to ACCOBAMS since 2002, there is no Syrian law that refers specifically to cetacean protection. The new draft of an "Aquatic Organisms Law" (currently under review and expected to be approved by 2008) includes a specific article for the protection of cetaceans. This Action aims to provide legal support for the proper wording of new regulations and for the amendment of existing regulations, to ensure the full protection from killing, harming, capture, handling and harassment to all marine mammal species within the territorial waters of Syria.

Additional effort will be necessary to harmonize the Syrian legislation with the international agreements ratified so far (see "Legal framework") with regard to the protection of marine biodiversity and cetaceans in particular.

**Possible actors**
Syrian Government experts. ACCOBAMS can help identify a qualified expert in international marine mammal protection law.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
<tr>
<td></td>
<td>2 months</td>
<td>6,000 €</td>
</tr>
</tbody>
</table>

4.2. Make fisheries sustainable

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make fisheries sustainable and ensure long-term ecosystem services.</td>
<td>Manage the fishing effort based on evidence provided by scientific studies.</td>
</tr>
</tbody>
</table>

**Description**
Adopting new regulations and enforcing the existing laws and agreements with regard to sustainable fisheries management should be seen as a high priority. Evidence resulting from Action 3.4 should be promptly incorporated into national legislation. The issuing of new fishing licences should be regulated and the current licensing system should be reviewed as appropriate based on documented evidence of overfishing. The use of fishing gear, methods or effort that is documented to cause damage to marine ecosystems and overexploitation of fishing resources should be banned or appropriately regulated. Illegal fishing in Syrian waters by foreign fleets should be effectively prevented. Other kinds of illegal fishing (e.g. with regard to gear, mesh size, use of explosives or chemicals etc.) must be stopped immediately through methods including appropriate penalties and education campaigns.

**Possible actors**
HIMR, SSCW, stakeholders (i.e. fishermen cooperatives), international experts, ACCOBAMS, RAC-SPA.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
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</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,000 €</td>
</tr>
</tbody>
</table>
### 4.3. Ensure that environmental impact assessments give special consideration to cetaceans and their habitat

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid damage to cetacean populations resulting from human activities.</td>
<td>Require investigation of potential damage to cetaceans in environmental assessment studies.</td>
</tr>
</tbody>
</table>

**Description**

Damage to cetacean populations should be prevented by developing impact assessment procedures that carefully consider the possible impact on cetaceans of human activities. This Action aims to ensure that compatibility between human activities and the mandate of preserving natural resources including cetaceans is carefully considered in environmental impact assessments. Independent international experts should be involved in the assessments whenever needed, to complement national capacity.

**Possible actors**

Syrian Government, HIMR, national and international experts.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
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</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
</tbody>
</table>

### 4.4. Support the development of NGOs concerned with the conservation of the marine environment

<table>
<thead>
<tr>
<th>Objective</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit from the contribution of NGOs to the conservation process.</td>
<td>Support the creation, development and growth of conservation-oriented NGOs.</td>
</tr>
</tbody>
</table>

**Description**

Non-governmental non-profit organizations (NGOs) are one of the most powerful driving forces in the marine conservation process, including in the Mediterranean region. The importance of science-based conservation NGOs should be recognized and formally supported. The establishment of new NGOs concerned with the conservation of the marine environment should be encouraged, also recognizing that competition among NGOs may contribute to quality and efficiency while also increasing the variety of services and expertise. NGOs should be provided with opportunities for development and professional growth and - once mature - involved in the decision-making process.

**Possible actors**

Ministry of Local Administration and Environment.

<table>
<thead>
<tr>
<th>Implementation Calendar</th>
<th>Duration</th>
<th>Indicative cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
</tr>
</tbody>
</table>
**Literature cited**


Annex 1. Participants in meetings held in the context of this Action Plan

Jasem Alhasan  
Director, Port of Banias, General Directorate of Ports

Ali Durgam Ali  
Director, Port of Arowad Island, General Directorate of Ports

Sohael Badour  
President, Cooperative of Fishermen, Ras Al Bassit

Mohamed Baker  
Researcher, High Institute of Marine Research

Sebhi Bakour  
President, Cooperative of Fishermen, Port of Yugoslavia

Ali Dayoub  
Director, Anti-Marine Pollution Department, General Directorate of Ports

Haitham Dib  
Director, Fisheries Management Department

Ibrahim Dib  
Director, General Directorate of Water Quality Control

Zahed Haj Mosa  
Governor, Prefecture of Lattakia

Mohsien Hasan  
General Director, General Directorate of Ports

Morhaf Lahlah  
Researcher, High Institute of Marine Research

Nour Aldeen Yousef  
Head of Laboratories, General Directorate of Water Quality Control

Seifalden Nour Aldeen  
Dean, High Institute of Marine Research

Ghydaa Younes  
Delegate, Ministry of Local Administration and Environment

7 In addition to Joan Gonzalvo, Amir Ibrahim, Akram Issa Darwish, Butheina Jray and Lobna Ben Nakhla.
Annex 2. Documentation of stranding events

Sperm whale stranded in Tartuous Beach, April 18th, 2005. Photo courtesy of Dr. Amir Ibrahim and his research group.

Cuvier’s beaked whale stranded in Borj Islam, April-May, 2005. Photo courtesy of Dr. Amir Ibrahim and his research group.

Cuvier’s beaked whale stranded in Al Basit - Om Altiour, March 11th, 2005. Photo courtesy of Dr. Amir Ibrahim and his research group.
Humpback whale stranded in Tartous, March 12th, 2003. Photo courtesy of Dr. Amir Ibrahim and his research group.

Bottlenose dolphin found in Jableh, July 24th, 2006. Photo courtesy of Dr. Amir Ibrahim and his research group.
Bottlenose dolphin found in Ibn Hani MPA, October 8th, 2006. Photo courtesy of Dr. Amir Ibrahim and his research group.

Bottlenose dolphin found in the harbour of Banias, April 2007. Photo courtesy of Dr. Amir Ibrahim and his research group.

Bottlenose dolphin found in Iben Hani, May 4th, 2007. Photo courtesy of Dr. Amir Ibrahim and his research group.
Annex 3. Some organizations and individuals with relevant expertise

The following organizations, institutes and individuals may play relevant roles in the implementation of this Action Plan.

It should be noted that this list is merely indicative and should not be considered exclusive with respect to other organizations or individuals not included here.

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www.alnitak.info

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digilander.libero.it/cetaceantissuebank/INDEXUK.HTML

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University of Valencia, Spain
Contact person: Juan Antonio Raga
Unidad de Zoología Marina, Instituto Cavanilles de Biodiversidad y Biología Evolutiva
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www.uv.es/cavanilles/zoomarin/index.htm

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tel. +49 (0)89 61002395; fax +49 (0)89 61002394
e-mail: niki.entrup@wdcs.org
www.wdcs.org

WWF Mediterranean Programme
Contact person: Sergi Tudela (Fisheries Coordinator)
Carrer Canuda 37, 3er, 08002 Barcelona, Spain
tel. +34 933056252; fax +34 932788030
e-mail: studela@atw-wwf.org
www.panda.org/about_wwf/where_we_work/europe/what_we_do/mediterranean/index.cfm

The web site of ACCOBAMS provides information and contacts with regard to its Partner organizations and other Institutes with relevant expertise, e.g. in its Education section:
www.accobams.org

A comprehensive list of non-governmental organizations working on Mediterranean Sea megafauna (including cetaceans) can be found at the following link:
www.mediterraneanconservation.org

The web site of the Cetacean Alliance (a not-for-profit network of non-governmental organizations committed to preserving marine biodiversity and reducing human impact on cetacean populations) offers links to relevant resources to support education and promote public awareness:
www.cetaceanalliance.org
Annex 4. Mission to Syria - Photo Album

High Institute of Marine Research (HIMR), Lattakia.

Participants to the meeting at the General Directorate of Ports (GDP), Lattakia.
From left to right: Boutheina Jray (Ministry of Local Administration and Environment),
Ali Dayoub (Director Anti-Marine Pollution Department-GDP), Amir Ibrahim (HIMR),
Mohsien Hasan (GDP, General Director), Ghysaa Younes (Ministry of Local Administration and Environment),
Lobna Ben Nakhla (RAC-SPA), Haitham Dep (Fisheries Department-GDP)
and Joan Gonzalvo (Tethys Research Institute).
Humpback whale skeleton on display at the HIMR headquarters.

"Let's Save our Oceans" framed print at the HIMR headquarters.
Examples of human impact along the Syrian coastline (Tartous region).
Typical artisanal fishing boats from Arowad Island.

Purse seiner at Port Yugoslavia, Lattakia.
Interviews with Syrian fishermen provided useful information. Ras Al Bassit (above) and Port Yugoslavia (below).
Fisherman mending his nets at Port Yugoslavia, Lattakia.

Fishermen preparing their longlines at Arowad Island.
Most of the beautiful Syrian fishing vessels built in the shipyard of Arowad Island are made of wood.
Lattakia’s fish market. Two fishmongers showing their product (above); small sharks on sale (below).
Undersized species are not unusual at the fish market of Lattakia.
Examination of a very young female Cuvier’s beaked whale stranded in Rmielah on March 3rd, 2008.