Initiative for the Conservation of Cetaceans in Greece

# *National Strategy* and *Action Plan*
## for the Conservation of Cetaceans in Greece

2010 - 2015

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This document, together with the technical report 'Cetaceans in Greece: present status of knowledge' (Frantzis 2009) is the result of a collaboration between four non-governmental organisations – MOm, Pelagos Cetacean Research Institute, Tethys Research Institute and WWF Greece – intended to advance the conservation of cetaceans in Greece through joint, coordinated actions of its members. These organisations agreed that the goal of conserving cetaceans can be achieved more effectively through cooperative work than through isolated efforts.


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# About the authors

**Giuseppe Notarbartolo di Sciara** (born in Venice, Italy, in 1948) holds a Ph.D. in marine biology from the Scripps Institution of Oceanography, with a thesis on the systematics and ecology of manta rays in the Gulf of California, where he discovered and described a new species. In 1986 he spearheaded the creation of the Italian national cetacean stranding network (Centro Studi Cetacei), which he coordinated until 1990. In 1986 he founded the Tethys Research Institute, which he directed for 10 years. In 1991 he proposed the creation of the Pelagos Sanctuary for Mediterranean Marine Mammals, which was established in 1999 by Italy, France and Monaco. He is now honorary president of Tethys. In 1996 Giuseppe was nominated president of the Central Institute for Applied Marine Research (ICRAM) in Rome, where he served for seven years. From 1999 to 2003 he served as Commissioner or Alternate Commissioner for Italy at the International Whaling Commission. He chaired the European Cetacean Society from 1993 to 1997. His current activities include: regional coordinator for the Mediterranean and Black Seas, WCPA Marine (since 2000); deputy chair, SSC Cetacean Specialist Group (since 1991); member, SSC Shark Specialist Group (since 1993); chair, Scientific Committee of the CMS Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS; since 2002). Since 2006 he teaches a course on the conservation of marine biodiversity at the University of Milan. Giuseppe spends about half of his time at his house on the island of Patmos, in the Dodecanese.

**Giovanni Bearzi** (born in Venice, Italy, in 1963) holds a Ph.D. in zoology from the University of Basel, Switzerland, with a thesis on Mediterranean coastal dolphins. He has been carrying out and coordinating dolphin research projects since 1986, particularly in the Adriatic and Ionian Seas. He founded and directed for a decade a dolphin research and conservation programme in Croatia, which 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 strives to integrate his interests, including design, computer media, science and ethics, into new ways of communicating concern for the ongoing loss of marine biodiversity. 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. He is founder and coordinator of the Cetacean Alliance. In 2001 he was awarded a Pew Marine Conservation Fellowship. Giovanni spends about half of his time at dolphin research stations situated along the Ionian Sea coast of Greece.

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# *Foreword*

The Greek Seas host a large number of different cetacean species and constitute an important marine area within the Mediterranean Sea. Over the last decades there has been limited effort invested in the study of cetacean species by various national and international research and conservation groups. Current and past research activities have been focused in distinct areas resulting in a patchy mosaic of our knowledge on cetaceans across Greece. These studies provide strong evidence for the continuous decline in the abundance of cetacean species in the Greek Seas and increasing anthropogenic mortality, suggesting the urgent need for conservation actions. The lack of substantial funding on a national scale basis, the failure of national and international authorities to secure protection for cetaceans and the absence of joint initiatives among the various research and conservation cetacean expert groups has become a major obstacle in effectively addressing the continuous degradation of marine ecosystems and of the decline of cetacean species in Greece.

The present document, the National Strategy and Action Plan, in conjunction with the recently published technical report "Cetaceans in Greece: present status of knowledge" (Frantzis 2009), represent the first important steps towards a new joint initiative for the conservation of cetacean species in the Greek Seas. The new initiative is a common effort among research groups, institutes, environmental NGOs and individual experts dedicated for decades to the research and active conservation of the marine environment and marine mammals. MOm/Hellenic Society for the Study and Protection of the Monk Seal, Pelagos Cetacean Research Institute, WWF Greece, Tethys Research Institute and Dr. Giuseppe Notarbartolo di Sciara comprise the core of the new initiative, which was established to tackle the cetaceans issue.

The "National Strategy and Action Plan for the Conservation of Cetaceans in Greece" presenting the rationale, objectives, and necessary actions to achieve these objectives within the 2010-2015 period, will serve as the key policy tool that would guide our common efforts to advance and ultimately achieve the common goal of ensuring the recovery and long-term viability of whales, dolphins and porpoises in Greek waters.

On behalf of the participants of the initiative,

Dr. Spyros Kotomatas

Director of MOm

# 1. Introduction

Of eleven species recorded off Greece, six are present year-round throughout the area (striped dolphin *Stenella coeruleoalba*, common bottlenose dolphin *Tursiops truncatus*, short-beaked common dolphin *Delphinus delphis*, Cuvier's beaked whale *Ziphius cavirostris*, sperm *whale Physeter macrocephalus* and Risso's dolphin *Grampus griseus*). Two species have been recorded in specific portions of the Greek seas (harbour porpoise *Phocoena phocoena* and fin whale *Balaenoptera physalus)* and three other species are rarely recorded (humpback whale *Megaptera novaeangliae*, false killer whale *Pseudorca crassidens* and common minke whale *Balaenoptera acutorostrata*; Frantzis 2009).

Clearly, Greek waters still harbour a remarkable richness of cetacean fauna compared to the rest of the Mediterranean. And yet, such richness is progressively eroding due to rapidly growing degradation of the marine environment. The Strategy proposed in this document identifies measures intended to halt and reverse such devastation.

Many of these measures should be grounded in a widespread increasing appreciation by civil society of the range of goods and services provided by healthy and well-conserved ecosystems. Such process will only be successful if marine conservation is incorporated into the system of values of the Greek general public. An effective conservation strategy must therefore become a national affair, through which people are made aware of the links between their individual behaviour and the state of the environment. Conserving nature, and therefore conserving the sea, should be grounded in this new understanding, and encompass behavioural changes that involve all sectors of society.

Furthermore, marine conservation (and therefore cetacean conservation) must be widely perceived as necessary and legitimate, and management measures must be seen as a means to benefit future generations as well as our own, rather than scattered, exceptional concessions to a small group of conservation fanatics. The conservation movement must manage to communicate and convince, fascinate and convey absorption towards the fate of a wonderful world that is progressively fading away.

Therefore, the substantial problem to be addressed goes well beyond the reductive task of ensuring the survival of whales, dolphins and porpoises in Greek waters. Cetaceans are only the tip of a melting iceberg. Losing cetaceans from the Greek Seas – a disaster in progress - is one of the many signs of a serious pervasive and progressive disease affecting the nation's ecosystems and natural treasures. It is not only cetaceans but the general health of the marine environment that needs to be addressed in a holistic way, consistent with a wealth of international, European and national legal instruments that Greece has committed to implement.

Unfortunately, as explained in greater detail in the following pages (Section 4) and in Frantzis (2009), there is high concern for the conservation status and survival of many cetacean populations living in Greek waters, and in spite of the many legal requirements to do so, there is no strategy in place to counteract threats to cetacean survival in Greece, and no special conservation efforts are being implemented at this time. This consideration created the impetus for the development of an initiative dedicated to the advance of the conservation of cetaceans in Greece, through a collaboration between four non-governmental organisations – MOm, Pelagos Cetacean Research Institute, Tethys Research Institute and WWF Greece – convinced that through cooperative work and joint action that the goal of conserving cetaceans in Greece can be achieved more effectively, than through individual actions. The formulation of a Conservation Strategy, in conjunction with a review of *Cetaceans in Greece*: *Present Status of Knowledge*

(Frantzis 2009), is offered here as a key policy tool to base future actions towards improving the cetaceans conservation status, and thus it is one of the first actions that the Initiative decided to implement.

While many of the measures recommended in this Strategy specifically pertain to cetacean conservation, such measures make little sense if marine degradation is not halted through the proper management of fishing pressure, coastal development, proliferation of shipping and boating, chemical and noise pollution, and climate change. All these pressures are already addressed by several regulations, and these must be heeded while specific problems affecting cetaceans are addressed.

This effort can positively work also the other way around. Addressing cetacean conservation problems may be an extraordinary opportunity for awakening the country to the impending marine ecological disaster, and stimulating action to change this condition. Whales and dolphins are quite popular amongst the general public, and as charismatic animals they can provide impetus for conveying the right message concerning marine conservation.

The proposed Strategy identifies four objectives to reach the ultimate goal of ensuring the recovery and long-term viability of cetaceans in Greek waters: 1) the need for conserving all marine mammal species as an important component of the marine environment is clearly perceived and widely felt by the general public, 2) cetacean conservation measures are legally adopted and effectively implemented throughout national waters (including strengthening the needed institutional framework), so that threats are diminished and cetacean populations and habitats nation-wide are not lost, 3) areas containing critical cetacean habitat in Greece are identified and protected, and 4) knowledge of cetacean ecology and biology important for the conservation of the species is secured. Actions devised to reach each objective are described in the Action Plan and linked with indicators of achievement.

While adopting and implementing the measures proposed in this Strategy would prevent the further decline of cetaceans from the Greek seas and allow for the recovery of important population units, the change of mentality, attitude and policy required for the full implementation of the Action Plan represent a major challenge. It may take a generational change to see people relenting on current aspirations to possess ever-increasing material goods, and on assuming that there are no limits to the right of thoughtlessly using and abusing of the environment. This will be a long process, and certainly not one that can be achieved within the short time horizon of this Strategy (five years). Actions to achieve this result are presented here with the goal of initiating and facilitating such attitudinal change in society.

It will take tremendous effort to induce the needed change, at least in part, of the current profligate behaviours, including those by national leaders and managers, and instil a widespread sense of stewardship for the remarkable natural treasures that Greece is endowed with. People dreaming for this to happen may have to endure decades of frustration, and witness more environment devastation and biodiversity loss. However, change is in the air, and fight we must to steer such change into a direction that will bring greater harmony between humans and the sea: an οικος they share with dolphins and whales.

# 2. Conservation strategy for cetaceans in Greece (2010-2015)

## 2.1. Goal

*"To assure the recovery and long-term viability of cetaceans (whales, dolphins and porpoises) in Greek waters".*

## 2.2. Objectives

In order to attain the strategic goal, four objectives are identified, to be reached by 2015. The objectives are briefly described below. No hierarchy of priority is intended amongst the objectives: all are equally important, and should be pursued in parallel. Each objective is conceived to work in synergy with the others.

### *1) The need for conserving all marine mammal species as an important component of the marine environment is increasingly perceived and widely embraced by the general public*

Public awareness and education represent essential parts of this Strategy, as they create a favourable ground for conservation-oriented policy and management. As long as people are not made aware that cetaceans are present in their local waters, that the animals' existence is threatened, and that there are good 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) is an essential component of conservation efforts.

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. A future for cetaceans in Greece will be secured only if a significant portion of civil society will attribute to these mammals the value they deserve, and if halting the disappearance of cetaceans from national waters will be seen as the epitome of reversing the devastating trend of loss of naturalness that is plaguing the Mediterranean, Greek seas included. Political action needs to be galvanised by a clear perception of popular will, in large part stimulated by NGOs as well as communicated and amplified by the media.

Thus, ensuring that civil society at the national level is aware of the existence in Greek waters of charismatic, yet highly vulnerable fauna, which is legally protected but at the same time under threat of disappearing if management and conservation action is not taken, will be essential to reach the strategic goal. Objective 1 is closely linked to Objective 2, but targets a different sector of society. The Strategy highlights the need to conduct public campaigns following well-defined, science-based public awareness strategies, and identifies a series of awareness and education actions targeting relevant stakeholders, managers, teachers, school children and the general public.

### *2) Cetacean conservation measures are legally adopted and effectively implemented throughout national waters (including strengthening the needed institutional framework), so that threats are diminished and cetacean populations and habitat nation-wide are not lost*

Since all threats to marine mammals derive from human actions, conservation ultimately depends on political decisions affecting human behaviour. The fate of cetaceans living in Greek waters depends on the political will to take responsible and precautionary action to mitigate the known anthropogenic threats. Some measures that will benefit the animals and their habitat are already embedded in the relevant legal framework at the national, European and international levels (briefly listed in Section 3.2), which in principle means that society has already accepted the need to change human behaviour in order to conserve marine mammals in Greece. If all such measures were to be fully implemented and enforced, a more favourable status of cetaceans would be assured.

However, implementation and enforcement of legislation is weak, and such weakness is problematic (Bearzi 2007). A considerable change is necessary to move from the vague political acceptance of a principle towards the building of the capacity and resolve of putting such principle into practice at the national level. This objective relates to: a) ensuring that the existing legal provisions are adequate to conserve cetaceans in Greece, b) recommending new management and conservation measures needed on the basis of current knowledge, and c) ensuring that such provisions are effectively implemented. This effort will involve, amongst other things, the development and validation of specific, measurable and robust management standards to achieve conservation goals.

In addition to measures specifically targeting cetacean conservation, honouring existing obligations with regard to the management of fisheries, pollution and other forms of habitat degradation represents the single most important action that can be envisaged. This Strategy recommends actions to ensure or facilitate respect for and implementation of such obligations.

### *3) Areas containing critical cetacean habitat in Greece are identified and protected*

Ensuring the conservation of cetacean populations in critical portions of their range through adequate measures - including the formal establishment of MPAs where appropriate, and their organisation into a network - is of fundamental importance and warrants the definition of a dedicated strategic objective.

While cetaceans are thought to have declined in many areas, there is still a large number of localities in Greek territorial waters and in the adjacent High Seas that contain critical habitat populated by several cetacean species. Some of these areas are well known, and have already been identified as important cetacean areas by ACCOBAMS, whereas other areas have not yet been properly investigated, and additional effort is needed for a more precise evaluation of their conservation value.

This Strategy identifies a series of areas of special conservation interest where specific management actions targeting well-identified threats to cetaceans should be taken without delay. It further calls for expeditiously filling knowledge gaps that prevent the identification of effective conservation strategies, through targeted research activities in other areas.

The management approach proposed in this Strategy is intended to pave the way for the future establishment of networks of MPAs or large MPAs to protect cetaceans and marine biodiversity, designed on the basis of appropriate information on ecology, distribution, long-range movements and spatial needs of these animals.

### *4) Knowledge of cetacean ecology and biology important for the conservation of the species is secured*

Science plays a crucial role in the conservation of cetaceans and their ecosystems. It provides information to decision makers, facilitating more informed decisions, policies, regulations and laws. In the long-term, scientific information may also help shape social values. As a human endeavour, science contributes most effectively when it is focused on important questions and is well conceived, designed and conducted (Reynolds et al. 2009).

The fundamental importance of science to inform the management process is so evident that it does not need to be reiterated. Indeed, insufficient knowledge may prevent the adoption of meaningful conservation measures, while research will provide data that are essential to design and implement successful management actions. However, the risks of simply perpetuating calls for more research must also be considered. While inaction may be often justified by lack of sufficient information, in many cases waiting for more and better data delays the conservation process indefinitely, diminishing the capability of producing timely results. This is an important concern for cetaceans conservation in Greece, since unwillingness to act based on what is known will result in delays that may cause the status of cetacean populations to deteriorate further.

In Greece, where baseline information is sometimes missing and conservation problems are acute, it is particularly important to assign priorities to research and obtain information in a timely manner, while ensuring that the management process is implemented, on the basis of the precautionary principle, without delay. Common sense must be combined with the available scientific evidence in developing reasonable and timely action, as long as conclusive scientific data are unavailable (Reynolds et al. 2009).

As a preamble of the National Conservation Strategy, an extensive review of the status of knowledge of cetaceans in Greece was compiled within the framework of the Initiative for the Conservation of cetaceans in Greece by MOm, Pelagos Cetacean Research Institute, Tethys Research Institute and WWF Greece (Frantzis 2009). Through this review it is evident that in recent years significant advances have been achieved in increasing scientific knowledge of cetaceans in the Greek seas. However, information is in some cases still too scant to allow the implementation of effective conservation measures. For example, knowledge of the presence of critical habitat in the Aegean Sea of populations of endangered Mediterranean cetaceans (short-beaked common dolphins, sperm whales, Cuvier's beaked whales, harbour porpoises) is inadequate to support in sufficient detail proposals for place-based conservation measures.

Considering all the points above, actions to reach this Objective will involve: a) the development of long-term, multidisciplinary population and ecosystem assessment research and management programmes suitably scaled to ecosystem complexity, b) ensuring that such programmes are sufficient to inform management decision-making regarding current and future threats, c) the identification of cetacean conservation units (i.e., a group of one or more local populations that share a common genetic lineage and that can be conserved effectively as a unit by virtue of their common productivity and vulnerability to existing threats), and d) increasing international cooperation in studying human-related threats to cetaceans. Furthermore, capacity building at the individual and institutional levels - a timely challenge and a high priority as far as marine mammals conservation is concerned – is also addressed in this Strategy.

# 3. Rationale and framework for protecting cetaceans in Greece

## 3.1. Rationale for protecting cetaceans in Greece

The world's oceans are populated by a very large number of organisms, and one may wonder what is the point of investing considerable attention, effort and resources to conserve a single group of animals - whales, dolphins and porpoises. We argue, however, that for a number of reasons protecting cetaceans may have a significant cascading effect which greatly transcends the strict conservation value of these captivating species.

**Why protect cetaceans?**

Cetaceans as important components of marine biodiversity

Biodiversity allows for the proper functioning of ecological systems, and the importance of preserving it cannot be underestimated (Worm et al. 2006). Biodiversity does not only refer to the variety of living organisms on our planet, but also to the interdependence of all living beings, including humans. The need for conserving biodiversity is a widely accepted principle globally, sanctioned by a large number of international conventions and treaties, most notably the Convention on Biological Diversity, in force since 1993 and signed by 168 nations. It is on the basis of such widely accepted principle that we advocate endeavouring to conserve marine biodiversity in Greece, and in particular cetaceans.

The fact that current national, European, regional and international legislation unambiguously provides for the protection of marine mammals in Greece demonstrates that society has embraced the concept, at least in theory. Cetaceans are essential components of marine biodiversity and losing them weakens and damages the ecosystems they are part of, by virtue of their important role of apex predators in marine food webs

Cetaceans as charismatic megafauna

A second reason for protecting cetaceans, which is particularly valid in Greece, is that these charismatic marine mammals may be used to trigger and sustain the protection of marine biota at the regional scale, owing to their quality of *umbrella*, *flagship* and *cultural keystone* species (Garibaldi and Turner 2004, Roberge and Angelstam 2004).

Cetaceans may serve well the function of umbrella species because they range widely, can be relatively easily monitored, and share their ecosystem with other species that may not be so easy to survey. Given their charismatic status, like other marine vertebrates, cetaceans also fulfil well the function of flagship species because they elicit a strong fascination from the wide public and are thus more amenable to be used to raise public awareness and financial support to promote broad conservation action.

Cetaceans as important components of the Greek historical heritage

Dolphins and other cetaceans permeate the Greek culture since ancient times. 'Dolphin' originates from ancient Greek δελφίς, which is related to the word δελφύς (womb). Countless artwork and several myths celebrate the strong and intimate bond between cetaceans and humans, perhaps most vividly praised in Arion's miraculous rescue by dolphins after the Greek poet was kidnapped by pirates. For centuries, dolphins have been at the core of the Hellenic culture and civilisation and vividly portrayed in iconography throughout Greece.

It is only in recent times that cetaceans seem to have progressively fallen into a kind of oblivion, apart from a remnant iconic role in tourist jewellery and postcards. Yet, the appeal of dolphins and other marine mammals can be easily resuscitated among the Greek, who are culturally inclined to consider these animals as 'special'. Emphasising the role of cetaceans as parts of the most genuine Hellenic heritage, as well as encouraging a sense of pride and appreciation for the populations of these animals living in national waters should be seen as an important component of sensible conservation strategies.

Cetaceans as important components of the Greek natural heritage

While the present abundance of cetaceans in Greek waters (and elsewhere in the Mediterranean) is likely only a fragment of what it was a century ago (e.g. see Bearzi et al. 2004, Lotze and Worm 2009), a remarkable diversity of cetacean species is still found in the territorial waters of Greece, where important cetacean populations live and reproduce (Frantzis 2009). In the current rather gloomy Mediterranean scenario, Greece is an extremely important

area for cetacean conservation, to the point that ensuring the long-term survival of healthy cetacean populations should be seen as both a national and an international priority.

The goal of preserving cetaceans in Greece is entirely consistent with the protection of natural resources that are one of the country's most important heritage and appeal (including to tourism). A rich and diverse natural environment is a treasure to be preserved for the benefit of present and future generations. Marine environments containing healthy cetacean populations have an aesthetic and cultural value and may attract visitors who want to enjoy a place where whales and dolphins are still thriving.

Cetaceans as paradigm of marine conservation

Cetacean conservation should be taken as a paradigm of a more widespread effort for ensuring a better conservation status of the marine environment, to be undertaken by society at large. This seems particularly important in Greece, which still hosts an important representation of Mediterranean marine mammal biodiversity, including the critically endangered Mediterranean monk seal (Notarbartolo di Sciara et al. 2009) and considerable cetacean diversity (Frantzis 2009). This concept is best expressed by Reynolds et al. (2009):

> *Marine mammals face an uncertain fate in our rapidly changing world. Despite human fascination with these species and protective legislation in many countries, conservation efforts for marine mammals have achieved mixed results to date: some species have experienced a degree of recovery following centuries of exploitation, whereas others have perished or are on the brink of extinction. To avoid or at least to minimize further losses, human societies must be willing to assess and alter their values and activities that compete with, or otherwise contribute to, the demise of marine mammals and marine ecosystems. The value of conservation must be elevated from an aesthetically pleasing concept championed when convenient to a fundamental construct of our lives and futures. This new paradigm will require a clear vision of future conservation goals and the roles of societies in achieving them, long-term planning and commitment of funding/resources, rigorous science to resolve critical uncertainties, precautionary protection of habitats and ecosystems in the face of such uncertainty, and an interdisciplinary, comprehensive approach to conservation that engages the social sciences and humanities to elevate the value of conservation over short-term economic gain and many other competing values.*

However, human societies are still far from this appreciation, particularly in the countries of the Mediterranean basin.

## 3.2. Legislative framework relevant to cetacean protection in Greece

### National legislation

Cetaceans in principle benefit from clear legal protection in Greece. By ratifying international conventions and introducing over the years national legislation, the clear intent of the Greek Legislator was to protect not only these species themselves, but their habitat as well. The following (listed in chronological order) legislation instruments are of particular relevance, direct and indirect, to cetacean conservation in Greece:

- Law 420/26/1970 (Fisheries Code), which governs fisheries activities and, through prohibiting illegal fishing activities, aims at conserving fish stocks.
- Law 743/77 for the protection of the marine environment.
- Presidential Decree 67/81/29-11-1980, conferring protected status to a number of threatened species including cetaceans, and forbidding their capture or killing.
- Law 1335/14-3-1983, ratifying the Bern Convention.
- Law 1337/14-3-1983, setting out special regulations for the protection of the nation's coastal zone.
- Laws 855/78 and 1634/18-7-1986, ratifying the Barcelona Convention and all its Protocols.
- Law 1650/16-10-1986, the framework legislation setting out the overall institutional and legal structure for the protection of the environment in Greece.
- Law 2055/30-6-1992, ratifying CITES.
- Law 2204/15-4-1994, ratifying the Convention on Biological Diversity (CBD).
- Joint Ministerial Decision 33318/3028/98, ratifying the 92/43 European Council Habitats Directive.
- Law 2742/1999 regulating all aspects related to the establishment of management bodies for protected areas and/or endangered species.

- Law 2719/1999, ratifying the Convention on Migratory Species (CMS).
- Ministerial Decision 336107/25-2-2000, establishing specific criteria, protocols and procedures for the establishment and operation of wildlife treatment and rehabilitation facilities.

### European legislation

Three important items of European Community law are relevant to cetacean conservation in Greece: Council Directive 92/43/EEC of 21 May 1992, on the conservation of natural habitats of wild fauna and flora (also known as the "Habitats Directive"), Council Regulation (EC) No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea (a.k.a. the "Mediterranean Regulation") and Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 (a.k.a. the "Marine Strategy Framework Directive").

The **Habitats Directive** (1992), the cornerstone of Europe's nature conservation policy, has major relevance to cetacean conservation in the Mediterranean Sea. The directive's overarching goal strives to ensure the "preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and wild fauna and flora" – an essential objective of general interest pursued by the Community, as stated in Article 130r of the Treaty of Rome. Cetacean species are listed in two of the directive's Annexes: II and IV. In Annex II *Tursiops truncatus* and *Phocoena phocoena* are designated as a species of Community interest whose conservation requires the creation of Special Areas of Conservation (SAC). Member States are mandated to take the requisite measures to establish a system of strict protection for all cetacean species – which are listed in Annex IV - and must establish a system to monitor the incidental capture and killing of such species. The Directive mandates Member States to designate SACs to protect species listed in Annex II, which should then be linked together to create a coherent European ecological network named ***Natura 2000***. SACs are designated on the basis of a list of Sites of Community Importance (SCI) selected because they contribute significantly, amongst other things, to the maintenance or restoration at a favourable conservation status of a species in Annex II. Once a SCI has been adopted, it must be designated as a SAC by the concerned Member State as soon as possible and within six years at most. The Habitats Directive was ratified by Greece in 1998 and has thus become national law. However, although there are currently 18 designated ***Natura 2000*** sites in Greece which host *Tursiops truncatus* and (erroneously one that supposedly hosts *Phocoena phocoena* in southern Aegean - GR4220013), no legislative framework exists in order for human activities to be regulated within these sites and no measures have been taken for the conservation of cetaceans. The only measure that currently exists concerns prohibiting fishing with trawl nets, dredges, purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams, coralligenous habitats and mäerl beds in ***Natura 2000*** sites which have been designated for the purpose of the conservation of these habitats under either Directive 92/43/EEC or Decision 1999/800/EC (Article 4 of EC 1967/2006).

The process of designating new marine ***Natura 2000*** areas in the Mediterranean is still on-going, however no official timetable existed at the time of writing this document specifying the next steps.

### The Natura 2000 network in the marine environment

Natura 2000 is a Community-wide network of nature protection areas established under the Habitats Directive (92/43/EEC) and Birds Directive 79/409/EEC. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats.

The responsibility for proposing sites for Natura 2000 lies with the Member States.

Natura 2000 marine areas will not necessarily be "no take zones", but zones where sustainable use of resources in an environmental friendly way is needed. For this reason they may require specific fishery management measures for the purpose of conservation of those species and habitats for which the site has been designated. Fisheries management measures in those areas should be decided in the context of the Common Fisheries Policy taking into account the principles of proportionality and non-discrimination.

Details on the establishment of a marine network of conservation areas under Natura 2000 can be found in the 'Guidelines for the establishment of the Natura 2000 network in the marine environment: Application of the Habitats and Birds Directives'[1].

The guidance document 'Introducing fisheries measures for marine Natura 2000 sites'[2] aims at facilitating the tasks of the Member State authorities and stakeholders when preparing and requesting fisheries management measures under the Common Fisheries Policy.

[1] http://ec.europa.eu/environment/nature/natura2000/marine/index_en.htm

[2] http://ec.europa.eu/environment/nature/natura2000/marine/docs/fish_measures.pdf

The **Mediterranean Regulation** (2006) effectively adapts the EU Common Fisheries Policy in the Mediterranean Sea context, by laying out the necessary measures for the sustainable exploitation of fishery resources. It aims at achieving sustainability of fisheries by specifying species and habitats that need to be protected, restrictions for fishing gears (technical measures, minimum distance from shore and minimum depth) and providing for the designation of fisheries protected areas and adoption of management plans, in territorial and community waters.

The recent **Marine Strategy Framework Directive** (2008) addresses the problem deriving from pressures exerted on natural marine resources and demand for marine ecological services, admittedly often too high in Europe, and the urgent need to reduce the Community's impact on marine waters. To do so, the Directive establishes a framework within which Member States shall take the necessary measures to achieve or maintain good environmental status[3] in the marine environment by the year 2020 at the latest. For that purpose, marine strategies shall be developed and implemented, amongst other things, in order to protect and preserve the marine environment. In particular, the Directive recognises the relevance to the achievement of good environmental status of the establishment of MPAs, including areas already designated or to be designated, amongst others, under the Habitats Directive, and under international or regional agreements to which the European Community of Member States are Parties. The Directive mandates each Member State to develop a marine strategy for its marine waters, culminating in the execution of programmes of measures designed to achieve or maintain good environmental status. The Directive sets out a process by which Member States develop their own marine strategies, including preparatory work, the establishment of environmental targets, the enactment of monitoring programmes, and the implementation of a programme of measures, including coherent and representative networks of MPAs, that must adequately cover the diversity of the constituent ecosystems. In particular, the Directive specifies that the obligation for Member States to designate *Natura 2000* sites will make an important contribution to the process.

The Marine Strategy Framework Directive (MSFD) was designed to create a synergy with the Habitats Directive for marine protection. The Habitats Directive had established a solid groundwork for species and habitat protection, whereas the MSFD provides a framework requiring Member States to adopt their own marine conservation strategy, which includes the provisions for species and habitat protection contained in the 1992 Directive. In addition, the MSFD contributes to the coherence between different policies, as well as fosters the integration of environmental concerns into other policies, such as the Common Fisheries Policy. Most importantly, the MSFD also introduces a plan of action including a binding time framework for Member States to comply: assessment of current environmental status and establishment of environmental targets by 15 July 2012; establishment and implementation of a monitoring programme by 15 July 2014; development by 2015 of a programme of measures designed to achieve good environmental status, which must come into operation by 2016 at the latest.

### International agreements

Marine mammal conservation is very high on the agenda of a large number of international environmental agreements, ratified by Greece.

These include, most notably:

- The **Mediterranean Action Plan** of the United Nations Environment Programme (UNEP MAP), with headquarters based in Athens and acting as the Secretariat of the Barcelona Convention ("Convention for the protection of the marine environment and the coastal region of the Mediterranean", Barcelona, 1976 and 1995). The Barcelona Convention is complemented by a number of specific Protocols, including the "Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean", which has relevance to the protection of cetaceans. A Regional Activity Centre for Specially Protected Areas (RAC/SPA) was established in Tunis with the mandate of supporting Parties to the Convention in the implementation of the Protocol's provisions. In particular, the Contracting Parties to the Barcelona Convention adopted in 1991 an "Action Plan for the conservation of Mediterranean cetaceans" (UNEP/MAP 1991), setting up conservation priorities (prohibition of deliberate taking; prevention and elimination of pollution; elimination of incidental catches in fishing gear; prevention of over-exploitation of fishery resources; protection of feeding, breeding and calving grounds; monitoring, research and data collection and dissemination with regard to biology, behaviour, range and habitats of cetaceans; and educational activities aimed at the public at large and fishermen) and obligations for the Parties.
- The **Convention on the Conservation of Migratory Species of Wild Animals**, also known as CMS or Bonn Convention (Bonn, 1979). Fin whales, sperm whales and short-beaked common dolphins are listed in the Convention's Appendix I (strictly protected migratory species that have been categorized as being in danger of extinction throughout all or a significant proportion of their range); the same species and striped dolphins are also listed in Appendix II (migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation

[3] Art. 3(5): " 'good environmental status' means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations, i.e.: (a) ... **Marine species and habitats are protected, human-induced decline of biodiversity is prevented and diverse biological components function in balance**; ...".

status which would significantly benefit from the international cooperation that could be achieved by an international agreement).

- The **Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area**, also known as ACCOBAMS (Monaco, 1996), a special agreement established under the framework of CMS, its "parent convention", aimed at the protection of all cetacean species found in the Agreement area.
- The **Convention on International Trade in Endangered Species of Wild Fauna and Flora**, also known as CITES or Washington Convention (Washington, 1973), forbidding trade in endangered species listed in its Appendix I (including, as far as cetaceans regularly found in Greek waters are concerned, fin whales and sperm whales), and regulating trade in other species, listed in Appendix II (all other cetacean species).
- The **Convention on the Conservation of European Wildlife and Natural Habitats**, also known as Bern Convention (Bern, 1979), placing all cetaceans regularly found in the Mediterranean in Appendix I (strictly protected fauna species).
- The **Convention on Biological Diversity**, also known as CBD (Rio de Janeiro, 1992), although not explicitly referring to cetaceans, urges Contracting Parties to develop national programmes that will safeguard their natural heritage and biological diversity.
- The **United Nations Convention on the Law of the Sea**, also known as UNCLOS (Montego Bay, 1982), has special provisions for marine mammals (Art. 65: "States shall cooperate with a view to the conservation of marine mammals...").

### International Union for Conservation of Nature (IUCN)

IUCN deserves to be mentioned separately owing to the relevance of this international NGO as a provider of specialised expertise in matters relating to the conservation of natural habitats and species. IUCN's actions are relevant to cetacean conservation in Greece in several ways. First, IUCN maintains the authoritative Red List of Threatened Species, where cetacean species found in the Mediterranean are listed as threatened under various categories of threat. In the Red List species of animals and plants are entered based on assessments of their threat status, using standardised criteria allowing placing the conservation status of taxa in a global perspective. Second, IUCN is active in the Mediterranean Sea under various capacities and activities (e.g., the Centre for Mediterranean Cooperation in Malaga, the Regional Coordination for the Mediterranean and Black Seas of the World Commission on Protected Areas – Marine, also known as WCPA), providing expert and technical support to a wide spectrum of conservation activities, including the establishment of MPAs. Finally, the Species Survival Commission's **Cetacean Specialist Group** (CSG) is well-represented in the Mediterranean region, and in Greece in particular (both authors of this document and the author of the Technical Report on cetaceans in Greece are current members of the CSG). The CSG can provide, if necessary, a body of collective expertise of great value to address the various challenges of cetacean conservation in Greece.

## Conclusions

Conservation on paper

There is no shortage of legal provisions, both at the national and European levels, to support cetacean conservation in Greece. It can be assumed that if correctly implemented and effectively enforced, the existing legislation would afford the species and their habitat a level of protection sufficient for populations to remain stable and recover if depleted. However, in spite of this wealth of legislative instruments and actions, cetacean conservation in Greece is far from assured.

The problem lies mostly with the implementation of the legal provisions and in their compliance. Illegal fishing (such as the use of explosives) and overfishing routinely occur throughout Greece, including in areas containing cetacean critical habitat. Individual cetaceans continue to be killed, and yet perpetrators have rarely been identified and prosecuted. Human encroachment in the nation's coastal zone – such as coastal construction and pollution discharges - continues unabated, affecting portions of the mammals' critical habitat. Areas that are well-known today as important sites for these species still lack any type of special protection; other similarly important sites are protected only on paper, without any effective enforcement conducted.

Finally, the systematic monitoring of incidental captures and killings of marine mammals, mandatory for all European Member States under the provisions of the Habitat Directive[4], is left to the initiative of NGOs rather than being resourced and/or carried out by the competent institutions.

[4] Art. 11: "Member States shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 2 with particular regard to priority natural habitat types and priority species".

Concerning the ***Natura 2000*** **network**, several Sites of Community Importance (SCIs) have been adopted which contain cetacean habitat. However, no conservation measures have been proposed for these sites, nor is there a framework to regulate human activities within them. Furthermore, none of them has been declared a Special Area of Conservation (SACs), even though the deadline of six years was conspicuously missed. Finally, many locations that are known for their special conservation importance for the species are not included in the SCI list. However, the process for designating new marine SCIs is still on-going, and the European Commission's biogeographical seminar for establishing new sites in the Mediterranean Sea is supposed to take place within 2010.

The Marine Strategy Framework Directive now provides Greece with an important opportunity for making up for the lost time through the development and implementation of its own national marine strategy. In that process cetaceans should become a centrepiece of the strategy both by virtue of their intrinsic value as elements of Mediterranean biodiversity, and because of their importance in support to the conservation of the nation's marine areas as umbrella and flagship species.

Overcoming frustration

Citizens may find it rather frustrating that so little was accomplished in terms of enforcement of legislation relevant to the conservation of cetaceans in Greece, in spite of the considerable body of specific international, European and national provisions.

Some may consider taking legal action to challenge the Greek State for its widespread failure in living up to its commitments and enforcing its own rule of law. That is certainly an option available to democratic societies. This situation is indicative of the inherent weakness of the international environmental legal system. A nation's commitment in such fora is not perceived as mandatory. Accountability is strictly of a moral nature, and thus easy to brush off. The only available tools to induce action remain diplomatic pressure and lobbying by concerned stakeholders. As a consequence, international leverage can only be subsidiary to a nation's own conservation undertaking and commitment, and the most relevant effort can only come from within.

A combination of direct conservation actions (including law enforcement) with education, awareness and advocacy campaigns seems to be the most promising avenue for success, and this is why so much importance was given in this Strategy to increasing awareness (see Section 2.2, Objective 1). All sectors of Greek society must be targeted by specifically tailored awareness campaigns, from policy makers to the general public, and from city dwellers to small insular communities. The latter in particular, which have the greatest opportunities for interaction with coastal dolphins, should not be left alone to bear the economic burden of coexisting with such marine mammals (i.e., damages to fishing gear and to the catch caused by dolphins, as well as by monk seals).

The conquest of local stakeholders to the imperative of conserving the marine environment and its inhabitants, be it under the impetus of aesthetic, cultural or environmental values, or in expectation of future economic gain (e.g. through ecotourism), seems like the most promising companion to a greater observance of the law.

# 4. Threats

## 4.1. Main anthropogenic threats

A variety of factors threaten cetaceans and their long-term conservation. The majority of these threats can reasonably be expected to increase in the foreseeable future (Reynolds et al. 2009), unless management measures such as those described in this Strategy are promptly adopted and implemented.

The main anthropogenic impacts that globally threaten the survival of cetacean populations are listed below.

**Prey depletion.** Depletion of food resources caused by the direct and indirect effects of fishing activities, illegal fishing and overfishing.

**Accidental takes in fishery activities (bycatch)**. Mortality or injury inflicted through the accidental entanglement in fishing gear of all types (including passive and active nets, longlines, traps, discarded or lost nets and lines, gear accessories, etc.) and illegal fishing practices (e.g., use of dynamite).

**Intentional and direct takes**. Killing or capture of cetaceans for use of products for human consumption or other, live capture, hostile acts provoked by actual or perceived damage to fishing activities, sport, and no apparent reason.

**Collisions and accidents with vessels**. Mortality or injury inflicted through collisions with the hull, prow, propeller blades, rudder or any other part of a vessel.

**Disturbance**. Behavioural disruption through intentional or non-intentional approaches, likely or proven to induce long-term effects in the population.

**Acoustic pollution (noise)**. Mortality or injury deriving from exposure to impulsive or prolonged man-made sound reaching noxious intensity and/or frequency levels.

**Ingestion of solid debris**. Mortality or injury deriving from the ingestion of foreign objects and materials, such as plastic, wood, textiles, etc. (in general obstructing part of the digestive tract).

**Contamination by xenobiotic compounds**. Accumulation in the body tissues (mostly through the food web) of xenobiotics (including POPs and trace elements) known to adversely affect mammalian functions and health.

**Oil pollution**. Mortality or health problems deriving from contamination, contact or ingestion of hydrocarbons deriving from oil spills and oil derivates at sea.

**Ecosystem change**. Impacts deriving from habitat degradation caused by coastal development and other direct or indirect changes in the ecosystem resulting from human activities (e.g. eutrophication, harmful algal blooms, prey depletion resulting from habitat degradation, alien species invasion).

**Climate change**. Likeliness that the population will be affected by changes in the ecosystem deriving from climate change.

## 4.2. Known or suspected impact of various anthropogenic threats

Combining the available information on species and threats into a table can provide useful insight (Notarbartolo di Sciara et al. 2002). The table displayed in Fig. 1 was created with the intent of giving a preliminary overview of the impacts from various threats on the different cetacean species living in Greek waters.

Colour scores in each cell were based on published information, either from Greece or elsewhere in the Mediterranean, integrated by experience and exchanges with colleagues working in the region. However, it is important to note that threats may differ greatly among areas. Therefore, the information provided here should be viewed as a first indication having merely an orientation value.

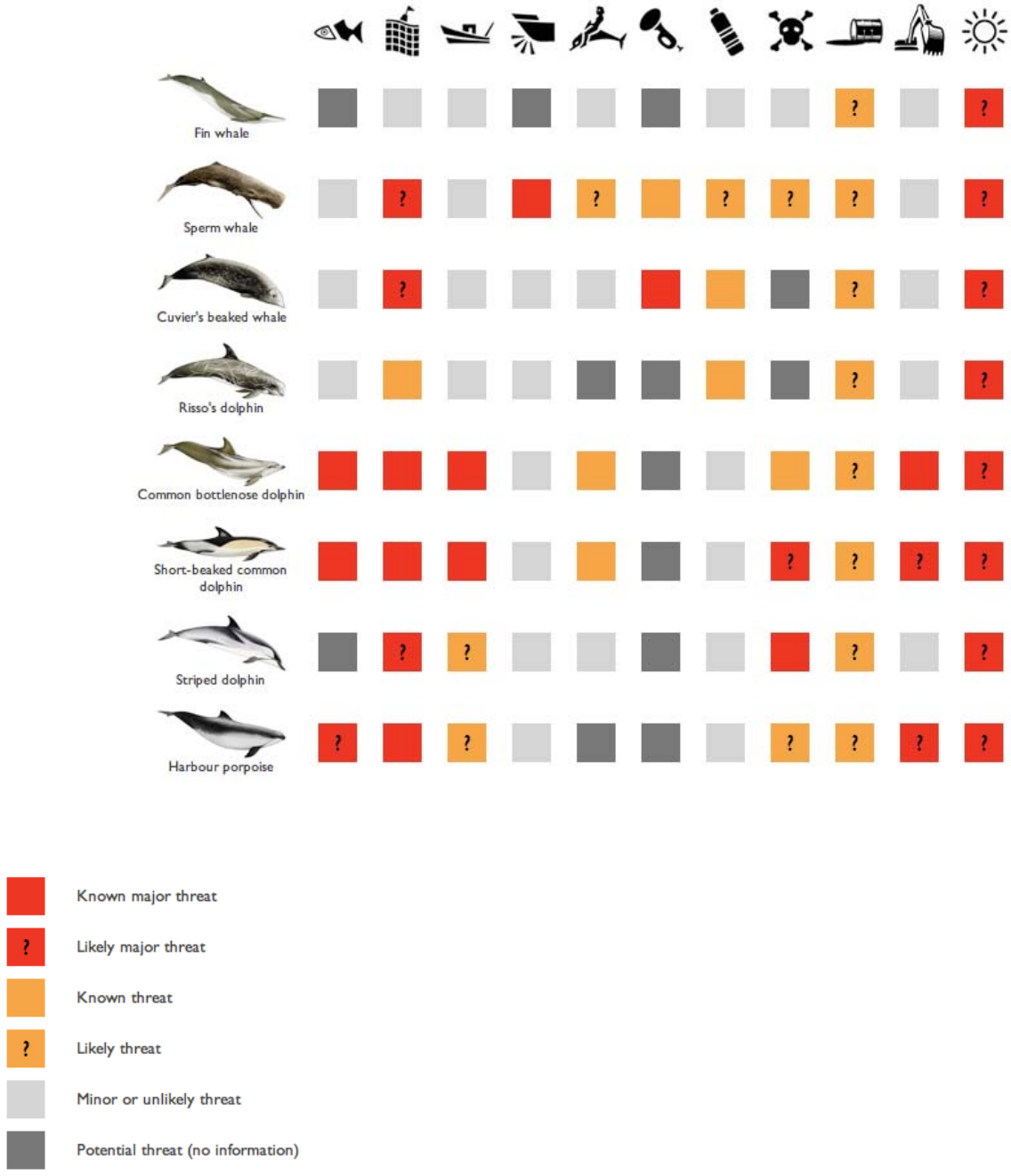


**Figure 1.** Known and likely threats to cetaceans in Greek waters.

## 4.3. Impact of various anthropogenic threats according to habitat

The impact of human activities tends to be particularly high in nearshore habitats, and decrease in offshore waters. However, some threats may be equally acute far from the coast. Considering that the greater part of Greek waters are situated near coasts, the impact of anthropogenic threats may be quite significant. Even 'pelagic' deep waters may be situated at a relatively short distance from the coast, thus exposing the local cetacean fauna to a variety of threats.

Fig. 2 provides an overview of the relative impact of various threats according to cetacean habitat. It should be noted that this table is not intended to highlight the relative impact of different threats.

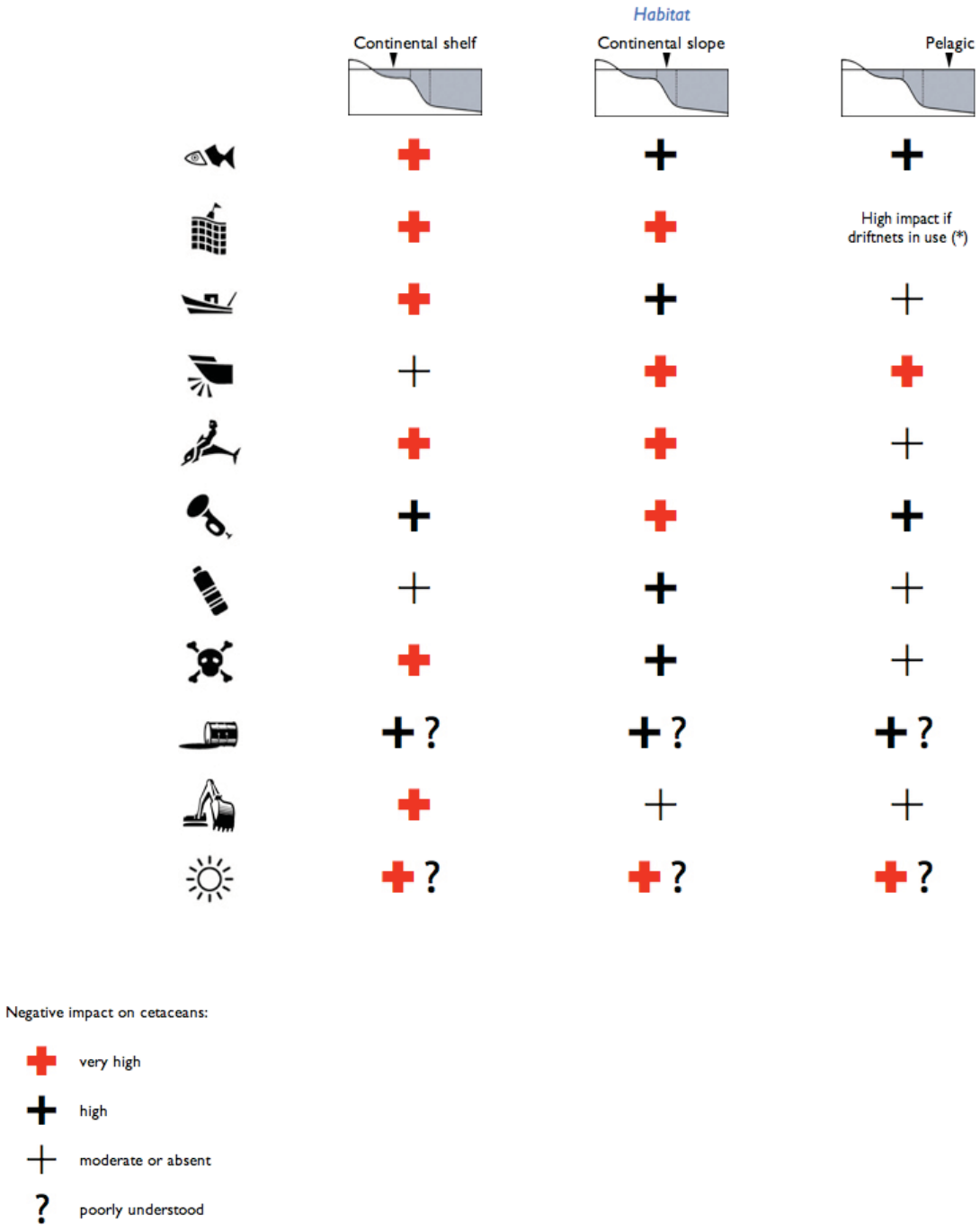


**Figure 2.** Threats to cetaceans in Greek waters according to habitat: continental shelf, continental slope and pelagic.
(*) Cetacean mortality events in illegally-deployed driftnets were reported to occur in Greek waters and adjacent High Seas.

## 4.4. Absolute impact of anthropogenic threats on cetaceans

Considering that the impact of the various anthropogenic threats varies according to species, habitat, and geographic area, it is extremely difficult to assess their relative importance for cetaceans generally. Indeed, some threats may be important for some species or local populations and less relevant for others. The scarcity of scientific information on cause-effect relationships makes it even harder to draw general conclusions.

However, it is important to realise that the impact of human activities on cetaceans is certainly much more pervasive than what can be seen through the narrow lens of obvious direct impact. While some threats may appear more dramatic, and may be easier to document (especially direct threats such as intentional killing of cetaceans, mortality in fishing gear or collision events) threats that are indirect, subtle and less visible may have an equal or even greater negative impact at the population level, eventually resulting in population decline or local extinction. In addition, when threats act cumulatively on the same population, end results may be greater than the simple algebraic sum of the impacts (Halpern et al. 2008).

It is therefore important that effective management measures are not based exclusively on anecdotal evidence or ease of documenting a given threat, but also on a thorough understanding of human impacts on the marine environment on which whales and dolphins ultimately depend.

As pointed out by Lotze and Worm (2009), current trends in marine ecosystems need to be interpreted against a solid understanding of the magnitude and drivers of past changes. Many populations of large marine animals worldwide have declined by 90% or more from historical abundance as a consequence of overharvesting, climate variation and other factors (Myers and Worm 2003, Ferretti et al. 2008, Lotze and Worm 2009). It is therefore mandatory to consider both the immediate and the long-term impacts, and to evaluate the various anthropogenic threats to cetaceans and marine biodiversity in the appropriate historical context.

Threats that should be considered as having a particularly high importance for cetaceans in Greek waters certainly include depletion of cetacean key prey and food-web modifications caused by overfishing, ecosystem damage caused by destructive fishing methods, the subtle impacts of climate change (ecosystem shifts caused by temperature and other changes), the effects of chemical and noise pollution, and pervasive habitat modifications and degradation caused by coastal development and increased exploitation and abuse of the marine environment for industrial, recreational and other use. These anthropogenic threats deserve to be addressed through comprehensive and thus more challenging management measures.

# 5. Areas of special conservation importance

## 5.1. Preamble

### Benefits of Marine Protected Areas

A number of Marine Protected Areas (MPAs) of different types, sizes and purposes have been established in several Mediterranean countries (Abdulla et al. 2008), including Greece, but specific measures for cetacean conservation are rarely included in their management plans.

If appropriately managed, MPAs could 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. Other types of action that can provide direct or indirect benefits include area-, season-, or fishery-specific regulation of fishing effort, changes to fishing gear or fishing practices to reduce incidental mortality, curtailment of inputs of pollutants, and boating regulations (Notarbartolo di Sciara 2007).

In a marine environment such as the Mediterranean, where human impact is so pervasive, 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 cetacean prey (Agardy 1997, Roberts et al. 2001). MPAs provide an ideal framework to conduct robust scientific investigations and ecosystem studies, and to combine them with socio-economic analyses and other management-oriented assessments. MPAs are also amenable to the promotion of respectful nature-watching, which may allow ex-fishermen or part-time fishermen to increase their income and begin to involve them, as well as other stakeholders, in the conservation process.

### Problems with Marine Protected Areas

However, several cetacean species are known or suspected to make long-range movements, and their presence may vary on a seasonal or annual basis. In these cases, 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 species' 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, habits and spatial needs of both the animals and their prey. Without knowing enough about the animals, there is a risk that MPAs will be ineffective as conservation tools, and even preclude the kind of broader-scale conservation initiatives recommended by this Strategy.

Another problem with MPAs is that their designation is often cumbersome, and it may take decades to make them a reality. Even when they are established, the challenge of managing them until they are fully functional remains (Togridou et al. 2006, Guidetti et al. 2008). Therefore, formally designated MPAs may not be invariably the most appropriate tool to ensure the solution of particular anthropogenic threats, as the lengthy process involved in their effective establishment may delay bringing about the timely mitigation that will prevent cetacean population from declining beyond recovery.

### Targeted and timely management measures within areas of special conservation importance

For the reasons above, this Strategy suggests that while the creation of a functional network of MPAs is extremely important, and in some cases the creation of an MPA represents the most appropriate management tool, it is also necessary to envisage ways for applying specific management measures in the short term to solve urgent conservation problems as soon as they are identified.

Targeted management measures must be applied immediately to areas identified through research as having special conservation importance for cetaceans, whenever particular anthropogenic pressures may jeopardise the survival of cetacean population and threaten marine biodiversity, also compromising the ecosystem services[5] to society.

[5] Based on the Millennium Ecosystem Assessment (2005), ecosystem services include: provisioning or production services (e.g., food, pharmaceuticals, ornamentals), regulating services (e.g., coastal protection, water purification and waste treatment), cultural services (e.g., recreation and tourism, knowledge and education), supporting services (e.g., primary production, nutrient cycling, habitat provision).

## 5.2. Areas of special conservation importance for cetaceans identified by ACCOBAMS

Between 2002 and 2007 the Contracting Parties to ACCOBAMS (the UNEP/CMS Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area, also ratified by Greece), by recommendation from the Agreement's Scientific Committee, adopted a list of areas in the Mediterranean and Black Sea that contain important cetacean habitat and that should be considered for protection (Fig. 3). Several of these areas lie in the Greek seas, consistent with the high importance of these waters for Mediterranean cetaceans (Frantzis 2009).

The areas identified by ACCOBAMS as containing important cetacean habitat and deserving special protection include the semi-enclosed Amvrakikos Gulf, the Inner Ionian Sea, the semi-enclosed Gulf of Corinth, the northern Aegean Sea, the Northern Sporades, the Saronikos Gulf, the Dodecanese and a part of the Hellenic Trench. Such proposals were intended to ensure the long-term survival of threatened cetacean populations as well as at preserving viable populations near corridors, to allow sufficient gene flow among subareas.

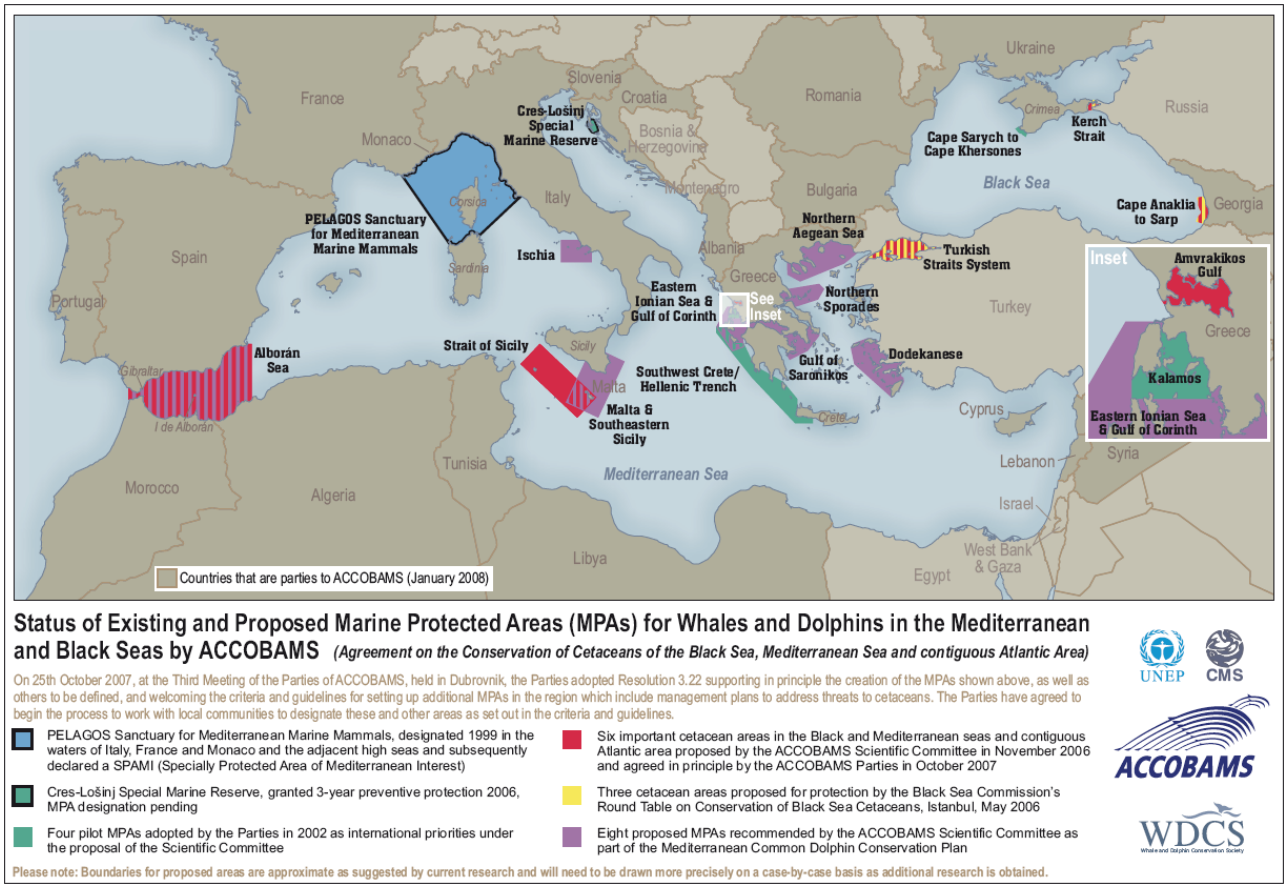


**Figure 3.** Status of existing and newly proposed Marine Protected Areas for Mediterranean and Black Sea cetaceans proposed by ACCOBAMS (map by Lesley Frampton and Erich Hoyt / WDCS). The already established Pelagos Sanctuary is shown in blue.

## 5.3. Areas of special conservation importance for cetaceans based on present knowledge

In several areas of special conservation importance for cetaceans, research has documented cause-effect relationships between pressure factors and local cetacean population status, and it was possible to identify the specific conservation needs of those populations. These areas are described in the table below and shown in Fig. 4.

| **Area** (in alphabetical order) | **Presence and status of cetaceans** | **Area's importance for cetaceans** | **Research priorities** | **Management action needed** | **Presence of other marine megafauna species in need of conservation** | **Sources** |
|---|---|---|---|---|---|---|
| **Amvrakikos Gulf**<br><br>(Designated as a National Wetland Park by Greece; see Annex) | Resident population of about 130 common bottlenose dolphins (2008 estimate) | Critical habitat for common bottlenose dolphins<br><br>The Gulf has one of the highest density of common bottlenose dolphins in the Mediterranean and their population qualifies as Endangered according to IUCN Red List criteria | Monitoring of population status and trends<br><br>Investigate degree of genetic isolation | Water quality management<br><br>Problems, conservation needs and actions to be undertaken are summarised in Annex | High density of loggerhead sea turtles<br><br>High diversity and density of sea birds, including endangered species | Bearzi et al. 2008a, in review |
| **Gulf of Corinth** | Critical habitat for isolated population units of striped dolphins and short-beaked common dolphins<br><br>Regular occurrence of common bottlenose dolphins | Immediate danger of extinction of an isolated population unit of short-beaked common dolphins<br><br>Habitat of a unique, isolated and vulnerable population unit of striped dolphins | Identification of potential threats<br><br>Assess dolphin abundance, status and trends<br><br>Investigate degree of genetic isolation | To be determined according to needed research | Sea turtles, sharks, tuna | Frantzis and Herzing 2002, Frantzis et al. 2003, Frantzis 2009 |
| **Hellenic Trench** | Critical habitat for a number of endangered and vulnerable cetacean species | Critical habitat of a small and endangered population unit of sperm whales<br><br>One of the most important sperm whale breeding areas in the Mediterranean Sea<br><br>Critical habitat for Cuvier's beaked whales | Assess abundance, status and trends of sperm whales and Cuvier's beaked whales<br><br>Investigate degree of genetic isolation | Mitigation of mortality due to ship strikes<br><br>Mitigation of noise resulting from use of military sonars and seismic surveys<br><br>Other threats to be identified through needed research | Monk seals, sea turtles, sharks, tuna, swordfish | Frantzis et al. 1999, Frantzis 2009 |
| **Inner Ionian Sea**<br><br>(Including the National Marine Park of Zakynthos and a number of Natura 2000 sites. The northern part of this area was designated as a Natura 2000 site by Greece, Frantzis 1997; see Annex) | Short-beaked common dolphins still present in high numbers in 1997, subsequent rapid decline caused by overfishing<br><br>Stable presence of common bottlenose dolphins<br><br>Occasional presence of other cetacean species | Immediate danger of extinction of the last short-beaked common dolphins living in the Ionian Sea<br><br>Critical habitat for common bottlenose dolphins | Monitoring of population status and trends<br><br>Monitoring of interactions with fisheries | Fisheries management<br><br>Problems, conservation needs and actions to be undertaken are summarised in Annex | Monk seals, loggerhead sea turtles, giant devil rays, tuna, swordfish | Bearzi et al. 2005, 2006, 2008b, in press, Piroddi et al. in press |
| **Thracian Sea** | Endangered harbour porpoises and short-beaked common dolphins | Presence of the only harbour porpoises surviving in the entire Mediterranean Sea<br><br>Potential critical habitat for short-beaked common dolphins | Identification of potential threats<br><br>Assess cetacean abundance, status and trends | To be determined according to needed research | | |

The main challenge for several other areas, of potentially high conservation importance, is that scarce information exists about the dynamics and exact distribution of local cetacean populations and the threats that may be affecting them. It is therefore difficult at present to propose specific management actions that may ensure conservation benefits. In such areas, preliminary information exists of their value concerning cetacean habitat (Frantzis et al. 2003, Frantzis 2009, Zafiropoulos and Merlini 2003; see Fig. 4).

However, present knowledge of population status, ecology and behaviour as well as of the main anthropogenic pressures is insufficient or inexistent, and will need to be quickly increased to inform conservation action. These areas of potential conservation importance include:

- Saronikos Gulf, Cyclades, Dodecanese, North-eastern Aegean, Northern Evvoikos Gulf, Northern Sporades, Pagasitikos Gulf, Northern Evvoia Straits, where short-beaked common dolphins and other cetacean species are known to exist.
- Myrtoon Sea, waters adjacent to the Halkidiki peninsula, Anatolian Trench, waters comprised amongst Skyros, Evvoia and the Northern Sporades (NW Aegean), where the presence of Risso's dolphins and sperm whales, has been consistently documented.

While sighting and stranding reports from these areas provide useful preliminary insight, they are inadequate to delimit critical habitat and to identify the management actions that are more likely to provide conservation benefits. Therefore, this Strategy advocates that an intensive multidisciplinary research effort is undertaken in the whole Aegean Sea, and particularly in the areas shown in Fig. 4, to provide sound science-based information that can be used to support focused and timely management action.


**Figure 4.** Areas of special conservation importance (green), and areas of potential conservation importance (shaded green circles) for Greek cetaceans.

Special attention should be also paid to the **Rhodes Gyre** (Fig. 5), a prominent feature of the oceanography of the eastern Mediterranean and an area of greatly enhanced production, particularly compared to the adjacent oligotrophic areas of the Levantine basin (Napolitano et al. 2000, Vidussi et al. 2001, Barale and Gade 2009). Seasonal pulses of very high primary productivity theoretically create suitable feeding conditions for various cetacean species. Unfortunately, no information exists on the species composition and density of cetacean fauna living in this part of the Mediterranean Sea, due to lack of dedicated research effort. This Strategy advocates that cetacean surveys be conducted in this area to test the hypothesis of a potentially significant local occurrence of cetaceans.

The specific actions needed for areas of special conservation importance are described into detail in the Action Plan (See Section 8.3).

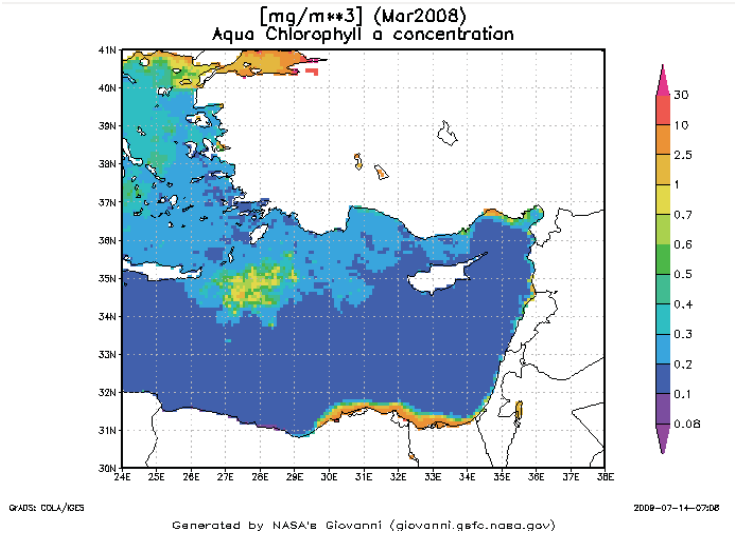


**Figure 5.** The Rhodes Gyre is a site where late-winter pulses of high primary productivity are likely to create suitable feeding conditions for various pelagic cetaceans.

# 6. Capacity building

Developing research and monitoring abilities throughout the region is a timely challenge and a high priority as far as cetacean conservation in Greece is concerned. Such challenge is twofold, and involves: 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.

Opportunities to get professional training in cetacean research techniques and learn about cetacean conservation and management strategies have increased in recent years. However, only a few local scientists can rely on appropriate training for their professional growth. This prevents the development of sound research programmes and conservation campaigns.

Poor access to information is a problem faced by many. Much of the specialized cetacean literature can be hard to access, as cetacean libraries are rare or privately held. Also, opportunities for learning are scarce, due for instance to scattered local expertise, limited contacts with other researchers, and the fact that professional cetacean conferences are rarely held in Greece. Facilities where professional work on cetaceans can be conducted are also scarce, thus weakening the potential of local students and young researchers interested in cetaceans.

This Strategy recognises the need to address two aspects of this issue:

a) **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.

b) **Institutional capacity** building requires a different approach. 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 in central or local authorities, bodies in charge of the management of Marine Protected Areas, research and teaching organisations, and advocacy organisations.

# 7. Towards an increased awareness of the need to protect cetaceans and marine biodiversity

Effective public awareness campaign having cetaceans and their ecosystems as central theme must aim to convey to managers, stakeholders and general public the idea that marine conservation should not be perceived merely as a concession to conservationist pressure, but as a legitimate and far-reaching initiative intended to benefit the whole of society and future generations.

This kind of holistic understanding should spring from a widespread appreciation of the natural world, its beauty, and the variety of ecosystem services that can be provided by an unspoiled environment. As a consequence, public awareness and education actions intended to instil a solid and long-lasting affection for nature are also likely to promote the development of a society that cares about cetaceans and marine conservation (Orr 2004).

### Speaking to wide audiences

The power and importance of communication are typically underestimated or overlooked by scientists, conservation biologists and managers, who often fail to convey their messages to the larger public. As a consequence, important scientific findings and conservation messages may never reach wide audiences. This limits the extent of public support to conservation action and hampers the implementation of effective mitigation strategies. Reaching wide sectors of the society is important not only because people can influence the market through their behaviour and choices, but also because people are the ultimate arbiters of public policy.

### Careful design

Even when public awareness and education campaigns are launched, these are rarely designed in the context of long-term strategies with clear objectives. It is important to realise that public awareness campaigns, as essential components of the conservation process, deserve to be carefully designed and professionally conducted, and they should benefit from expert supervision.

Campaigns that are principally intended to promote the image or work of particular bodies may fail to convey the kind of consistent, accurate, sharp and high-profile message that is necessary to influence in the long-term human behaviour and choices, and thus ultimately benefit the marine environment.

### Developing awareness campaigns on cetaceans

Some key issues that need to be taken into consideration in developing awareness campaigns on cetaceans are summarised below:

- Convey a positive conservation message (e.g. ‘cetaceans can be protected, and they are worth protecting’) rather than spreading exclusively negative information (‘cetaceans are vanishing’). The audience should be informed that these animals live in Greek waters, and that there is reason to hope that they will continue to do so.
- 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. 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. Positive examples can also be found in communities that have benefited from an enlightened management of marine resources.
- Encourage individuals to get involved. Show them that getting personally engaged is both feasible and personally rewarding. Propose practical ways of contributing to cetacean conservation. Volunteer programmes centred around research, if conducted professionally, represent effective means to get people involved and to show them reasons to care about the animals.
- Be versatile in the way of presenting cetaceans. Although a portion of the general public may see cetaceans 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 natural 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 ensure continued ecosystem services).

- 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 who may be directly affected by management actions targeting cetaceans.

### The role played by NGOs

Whereas other elements of this Strategy depend largely on the decision-making processes of national or supranational governmental agencies and international regulatory bodies (as well as on compliance, monitoring and enforcement), public awareness is an area in which private initiative and efforts by *inter alia* national and regional NGOs have an autonomous and important role to play.

# 8. Action Plan

The four objectives will be met through the implementation of a number of actions to be conducted between 2010 and 2015, listed below.

The guiding principle for the formulation of the actions listed below can be summarised by the 'SMART' concept (as described in http://gefweb.org/MonitoringandEvaluation/MEPoliciesProcedures/MEPIndicators/mepindicators.html) which provides five characteristics that actions must have:

**S** **"Specific**: The system captures the essence of the desired result by clearly and directly relating to achieving an objective, and only that objective.

**M** **"Measurable**: The monitoring system and its indicators are unambiguously specified so that all parties agree on what the system covers and there are practical ways to measure the indicators and results.

**A** **"Achievable and Attributable**: The system identifies what changes are anticipated as a result of the intervention and whether the result(s) are realistic. Attribution requires that changes in the targeted developmental issue can be linked to the intervention.

**R** **"Relevant and Realistic**: The system establishes levels of performance that are likely to be achieved in a practical manner, and that reflect the expectations of stakeholders.

**T** **"Time-bound, Timely, Traceable, and Targeted**: The system allows progress to be tracked in a cost-effective manner at desired frequency for a set period, with clear identification of the particular stakeholder group to be impacted by the project or program."

Although this Action Plan is presented as a series of separate actions, these will need to be integrated into comprehensive national management frameworks and programmes. An appropriate body for integrating the actions of this plan into a comprehensive programme could be the Advisory Committee, proposed to be established in Section 8.2, 2.C.

In some cases, sets of different actions can be particularly effective if conducted in the context of a single effort. For instance, educating fishermen, promoting alternatives to fishing and reducing bycatch and intentional killings may all fit within a single coherent course of action.

The actions are listed in a tabular form in Section 8.5, which also provides a set of indicators necessary for evaluating the achievements of the Action Plan. In the case of more complex actions, these are subdivided into different components.

## 8.1. Actions needed to reach Objective 1

***The need for conserving all marine mammal species as an important component of the marine environment is increasingly perceived and widely embraced by the general public.***

**1A Design, organise and conduct a nation-wide awareness campaign**

Formulate, fundraise for and implement a comprehensive awareness campaign designed to inform and convey to the general public in Greece the urgent need for conserving marine mammal species and their environment at the national level.

**1A.1** Define targets, and justify relevance of the different sectors of the target audience:

a. central government authorities (ministries of environment, rural development, merchant marine);

b. regional and local authorities (Port Police stations, Prefectures' departments of fisheries & environment, municipalities);

c. fishermen: three structural levels (confederation, federations, associations);

d. local communities in coastal and island areas of importance for cetaceans;

e. schools in coastal and island areas of importance for cetaceans;

f. recreational fishermen, divers, owners of sailing boats, inflatables, yachts;

g. regional NGOs;

h. scientific and conservation communities;

i. general public;

j. media;

k. shipping, marine transportation and tourism sectors

l. management bodies of MPAs

m. policy makers, politicians and decision makers.

**1A.2** Define a communication rationale (i.e. why protect cetaceans) and include in the communication strategy information (tailored to the different target groups) on the conservation problems affecting cetaceans in Greek waters to be addressed by the campaign(s) (e.g. long-term viability of cetacean populations in Greece is under threat from prey depletion and ecosystem damage caused by overfishing, incidental mortality in fishing gear, intentional takes, ship strikes, disturbance, pollution, noise, ecosystem change).

**1A.3** Define the actions (necessary and specific to both the need of conserving cetaceans in Greece and to the target audience identified) that will enable increasing awareness, promoting effective advocacy by NGOs, improving education programmes, implementing capacity building (see 1D), and engaging civil society at large in marine stewardship. This may include (but not be limited to) scientific conferences and seminars; production of communication material (leaflets, handbooks, web-sites, newsletters); production or translation of documentaries; identification of cetacean "ambassadors" and connected PR actions (e.g., interviews); implementation of advertising campaigns (TV, radio, interviews and advertorials); organisation of school environmental education programmes; photography and other exhibitions; events (concerts, theatre plays, etc.); organisation of a cetacean "road-show"; involvement of the public in a "cetacean observatory" (e.g. sighting and stranding network); use of less conventional tools such as viral campaigns, social networks, blogs; public opinion survey and research.

**1A.4** Define what is to be achieved at the end of the campaign(s) in terms of progress towards solving the cetacean conservation problems identified (i.e. the message of the information and communication campaign will coincide with the structure – goal and objectives – of this Strategy).

**1A.5** Implement the awareness campaign based on elements acquired under Sub-actions 1A.1 to 1A.4.

**1B Monitoring of the effectiveness of the awareness campaign.**

Monitor the project impact on the main target audience and on the cetacean conservation problems targeted, including the definition of indicators to assess:

**1B.1** management and legislative actions adopted and implemented by central and regional public authorities regarding conservation of cetaceans and marine environment;

**1B.2** public opinion surveys.

Appropriate activities to measure the impact of the campaign(s) on the target audience and, in principle, on the net effects on the cetacean conservation problems targeted must be included in the awareness campaigns, based on specific indicators. Action 1A must lead to 1) a measurable change of attitude in the daily life of the target audiences,

2) an improved implementation of policy and legislation at national, regional and local level, and to 3) an increased knowledge and best practices amongst stakeholders.

**1C Capacity building.** Support the building in Greece of capacity relevant to communication, education and awareness:

**1C.1** Ensure that cetacean conservation is appropriately addressed at the local level wherever appropriate, e.g., by developing local communication skills and activities targeting tourists in areas containing cetacean critical habitat, and that local actions are coordinated and in accordance with the Strategy.

**1C.2** Promote the establishment and coordination of NGOs relevant to cetacean conservation, and ensure that actions by advocacy organisations are based on accurate, objective background information grounded on solid science.

**1C.3** Support and promote academic and educational institutions to build capacity relevant to cetacean conservation.

## 8.2. Actions needed to reach Objective 2

***Cetacean conservation measures are legally adopted and effectively implemented throughout national waters (including strengthening the needed institutional framework), so that threats are diminished and cetacean populations and habitat nation-wide are not lost.***

**2A Integrate cetacean conservation within the Greek Marine Strategy**

Cetacean conservation efforts as described in this Strategy are integrated within wider marine conservation and management actions and measures, particularly as far as the formulation by Greece of the EU Marine Strategy Framework Directive is concerned.

**2B Strengthen the national institutional framework**:

**2B.1** Development of specific institutional capacity within governmental agencies to increase effectiveness of cetacean conservation policy and measures in Greece. This will involve addressing the problem of implementation and enforcement of legal provisions relevant to cetacean conservation in Greece.

**2B.2** Development of a nation-wide stranding network by interfacing with the existing one dedicated to monk seals (possibly also joining efforts with the marine turtle conservation community). Data to be entered into a dedicated central database (publicly available via the internet), in strict coordination with the relevant regional, European and international initiatives. Promote investigations of stranding causes, and provide research material and specimens useful for conservation purposes, to be deposited in appropriate, centralised tissue banks (national or ACCOBAMS; to be harmonised with actions 4D.1 and 4F.3).

**2C Create an Advisory Committee to support the Strategy implementation process**

As the actions outlined in this Action Plan are numerous and diverse, it is important to accomplish them in a coordinated and expeditious manner. Proper implementation by the appropriate institutional actors will require advisory support from a selected group of experts from the Mediterranean region having extensive scientific training in marine ecology and zoology, as well as a deep understanding of the management and organisational constraints of marine conservation in Greece. Such Advisory Committee will contribute with advice and recommendations to ensuring that the Action Plan is turned into a detailed and practical reality (including organising workshops, delivering

educational materials, liaising with other organisations, ministries, universities etc.). Part of this action will include preparing the Terms of Reference for the Advisory Committee once its creation by the relevant authorities is deliberated.

**2D Involvement of the fisheries sector**

Engage different fishery organisations (small-scale and medium-scale) at various levels (local, national) in cetacean conservation efforts.

**2E Involvement of the shipping sector**

Develop a plan and promote its adoption by the maritime sector to prevent ship collisions with large cetaceans (particularly sperm whales) across the Hellenic Trench.

**2F Protection of cetacean critical habitat from dangerous man-made noise**

Compile a list of areas of critical cetacean habitat and promote a ban of military manoeuvres involving the use of high-energy sonar, by the Greek relevant government authorities (i.e. Ministry of Defence), and a ban of oil & gas exploration involving the use of high-energy sound (i.e. Ministry of Industry/Development).

**2G Protection of cetacean critical habitat from disturbance from irresponsible whale watching activities**

Develop a regulatory mechanism to mitigate the negative impacts of irresponsible/unregulated cetacean watching, which may possibly result in habitat loss for cetaceans and promote its adoption and implementation by the relevant Greek authorities (i.e. Ministry of Tourism and Ministry of Development).

**2H Protect cetacean critical habitat in coastal areas**

In the coastal areas identified through actions related to Objective 4 as containing cetacean critical habitat, address the problem of degradation deriving from development (tourism, coastal construction, aquaculture etc.) through the adoption of stricter regulations relative to disturbance, introduction of sewage and runoff from urban areas, solid debris (Airoldi and Beck 2007, Reynolds et al. 2009), included if necessary *ad hoc* area specific management and mitigation measures.

**2I Address the potential problem of oil pollution in cetacean critical habitat**

Determine overlap between cetacean critical habitat identified through actions defined under Objective 4 and areas of intense oil tanker traffic (e.g. in relation to the imminent opening of the Alexandroupolis oil terminal and connected traffic through the Aegean Sea), and develop pollution prevention measures were appropriate, as well as a contingency plan for an emergency response mechanism for oil-spill disasters relevant to cetaceans (individuals and critical habitat).

**2J Address the problem of illegal fishing practices in cetacean critical habitat**

Ensure that illegal fishing practices, especially those having a direct negative impact on cetaceans or on cetacean critical habitat (i.e. the use of dynamite fishing) are prosecuted and the relative legislation is fully enforced.

## 8.3. Actions needed to reach Objective 3

***Areas containing critical cetacean habitat in Greece are identified, legally protected and organised into a functional network of marine protected areas in which cetacean numbers are stable or increasing.***

**3A Promote the adoption and implementation of effective management measures to preserve the environment of the Amvrakikòs Gulf**

Measures to be adopted and implemented expeditiously, based on results from appropriate environmental impact assessments, include restoration of water input from rivers and water exchange with the open sea, curtailment of anthropogenic pollutants and nutrients from agriculture, industry and city wastewaters, prevention of illegal fishing, and stricter management of fish farming activities. The specific management needs of this semi-closed Gulf are presented in greater detail in the Appendix.

**3B Protect cetaceans in the Gulf of Corinth**

Formulate and adopt the appropriate conservation measures (which may involve a proposal for the formal establishment of a cetacean MPA) to protect central and eastern Gulf of Corinth dolphins (short-beaked common dolphins, striped dolphins and common bottlenose dolphins) on the basis of identified threats.

**3C Protect cetaceans along the Hellenic Trench**

Implement management and conservation measures to protect sperm whales and Cuvier's beaked whales in the Hellenic Trench area, on the basis of identified threats (i.e., mortality resulting from ship strikes, noise produced by military sonar and seismic surveys) and other threats to be identified by further research. Measures should include the immediate cessation of all seismic and military sonar activities, and the introduction of shipping regulations aimed at mitigating risks of collision.

**3D Protect cetaceans in the Inner Ionian Sea**

Formally adopt and implement the proposed conservation measures in the Inner Ionian Sea, either through a fishery reserve, or through the transformation of the Natura 2000 and adjacent waters into a Special Area of Conservation. Ensure that measures including the specific management needs as proposed in the 'Kalamos Call' (see http://www.cetaceanalliance.org/call/index.htm) and outlined in the Appendix are effectively implemented.

**3E Protect short-beaked common dolphins and harbour porpoises in the Thracian Sea**

Formulate and adopt the appropriate conservation actions to protect short-beaked common dolphins and harbour porpoises, as well as other cetacean species occurring in the Thracian Sea, which may involve a proposal for the formal establishment of a cetacean MPA, on the basis of identified threats.

**3F Develop cetacean conservation actions in other areas, where preliminary information exists on the presence of important cetacean habitat**

Conduct targeted research that will provide the necessary scientific knowledge on cetacean population status, ecology and behaviour as well as of the main anthropogenic pressures and threats, that will allow the formulation of specific conservation actions (which may involve proposals for the formal establishment of specific cetacean MPAs) in relevance to the following areas:

- Saronikos Gulf, Cyclades, Dodecanese, North-eastern Aegean, Northern Evvoikos Gulf, Northern Sporades, Pagasitikos Gulf, Northern Evvoia Straits, where short-beaked common dolphins and other cetacean species are known to exist;
- Myrtoon Sea, waters adjacent to the Halkidiki peninsula, Anatolian Trench, waters comprised amongst Skyros, Evvoia and the Northern Sporades (NW Aegean), where Risso's dolphins and several other odontocetes have been repeatedly reported;
- Area included within the boundaries of the National Marine Park of Alonissos and Northern Sporades (NMPANS), where measures to protect cetaceans are to be incorporated into the Park management plan where appropriate.

**3G Promote the establishment of a functional network of cetacean MPAs**

While individual cetacean MPAs are proposed and designated, ensure that provisions are established for the organisation of such MPAs into a functional network. This should include facilitating meetings to bring together regularly cetacean MPA managers and local stakeholders to exchange views, share experience and discuss common challenges; encouraging MPA managers to develop relevant plans of action for cetaceans for each MPA and for the network as it develops; promoting exchanges and communication between cetacean MPA managers and non-specific MPA managers at the national as well as at the regional (Mediterranean) level; and ensure that cetacean MPA managers participate in the broader Mediterranean-wide MPA managers network (MedPAN). At the same time, a link should be established and maintained with international, European and regional agencies (e.g., the EC, UNEP MAP and ACCOBAMS) to ensure that the effort conducted at the national level within the auspices of this Action Plan is conducted in close coordination with wider efforts of establishing Mediterranean networks of MPAs.

## 8.4. Actions needed to reach Objective 4

***Knowledge of cetacean ecology and biology important for the conservation of the species is secured.***

There is an acute need for conducting systematic observations to inventory cetacean populations and delimit their habitat over large portions of the Greek Seas (particularly in the Aegean) so that needed conservation measures can be proposed in a timely and effective fashion. While we realise that the time and resources needed to perform all such studies and surveys may not be available within the short timeframe of this Strategy, Sections 4A and 4B provide an extensive list of necessary projects, with the understanding that their actual implementation will take place as the action plan develops and unfolds, on an opportunistic basis and when resources become available.

**4A Cetacean surveys**

A number of field surveys (vessel-based and/or aerial line transect, and application of spatial modelling to data analysis) should be undertaken in the Aegean Sea and adjacent waters (in particular in the Thracian Sea, the Saronikos Gulf and adjacent waters, the Cyclades, the Dodecanese and the Myrtoon Sea, as well as in the area of the Rhodes Gyre during spring; see Section 5.3 for greater details), to identify hotspots of cetacean occurrence that deserve place-based protection measures. Considering the high mobility of the species to protect, a commitment should be made to harmonize and coordinate nation-based survey efforts with a wider effort, which can be undertaken within the ACCOBAMS framework across the entire Mediterranean basin.

**4B In-depth studies of cetacean populations**

Initiate or continue studies of population abundance, trends and structure as well as habitat use and movement patterns of cetacean population units of particular importance, including:

**4B.1** Northern Aegean harbour porpoises, particularly to define population status and relationship to Marmara Sea and Black Sea conspecifics;

**4B.2** Aegean short-beaked common dolphins, particularly to define population status, abundance, trends and understand relationship to Ionian, Corinthian and Marmara/Black Seas conspecifics;

**4B.3** Striped dolphins, short-beaked common dolphins and common bottlenose dolphins in the Gulf of Corinth, to define abundance, status, trends and potential for genetic isolation (including genetic bottleneck or founder effect);

**4B.4** Common bottlenose dolphins in the Amvrakikos Gulf, to define status, trends and degree of genetic isolation;

**4B.5** Sperm whales and Cuvier's beaked whales in the Hellenic Trench, to define abundance, status, trends, critical habitat and degree of genetic isolation;

**4C Ecological interactions with fisheries**

Investigate cetacean – fisheries ecological interactions. Promote, where relevant, research on ecosystem and food-web dynamics, to be conducted in cooperation with fishery scientists having local knowledge, to obtain information on the direct and indirect impacts of fishing on cetacean conservation, such as in the case of short-beaked common dolphins and common bottlenose dolphins in the Inner Ionian Sea.

**4D Operational interactions with fisheries**

Investigate 1) occurrence of incidental mortality (bycatch) of cetaceans in fishing gear, and 2) occurrence of fishing gear and fish farms damage and/or depredation (either real or perceived), possibly triggering intentional kills or harm to cetaceans.

**4D.1** Regularly monitor stranding records (see also Action 2B.2) to detect and investigate fishery-related mortality.

**4D.2** Perform ad-hoc in-depth studies where and if hotspots of intentional or unintentional killings are detected.

**4E Scientific capacity building**

**4E.1** Promote the establishment of curricula relevant to cetacean conservation science in academic and professional institutions in Greece.

**4E.2** Promote the development of opportunities for professional growth to national researchers, and facilitate the process of publication of cetacean studies.

**4E.3** Seize the opportunity provided by sighting surveys and stranding networks to promote collaboration among individual scientists, government agencies and NGOs, and facilitate capacity building.

**4E.4** Organise and conduct on-the-job training courses on field techniques (e.g., photo-identification, surveys) to enable fledgling research teams to collect rapidly meaningful data.

**4E.5** Plan and fundraise for a National Cetacean Conservation Conference to occur in 2015, to provide a forum for national and foreign experts to discuss current knowledge within the cetacean science community, with experts from different disciplines, with stakeholders, managers and policy makers.

**4F Funding capabilities**

**4F.1** Promote the explicit inclusion of cetacean research and conservation in Government Aid Agencies funding mechanisms.

**4F.2** Encourage private funding institutions to support cetacean research and conservation activities.

## 8.5. Implementation of the Action Plan

### Implementation schedule

| **Objective 1.**<br>***The need for conserving all marine mammal species as an important component of the marine environment is increasingly perceived and widely embraced by the general public.*** | | | |
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| **Action** | **Sub-action** | **Indicators of achievement** | **Notes** |
| 1A. Formulate, fundraise for and implement a comprehensive awareness campaign designed to inform and convey to the general public in Greece the urgent need for conserving marine mammal species and their environment at the national level. | 1A.1. Define targets, and justify relevance of the different sectors of the target audience:<br>a) central government authorities (e.g., ministries of environment, agriculture, merchant marine);<br>b) regional and local authorities (coast guard stations, Prefectures' departments of fisheries & environment, municipalities);<br>c) fishermen: three structural levels (confederation, federations, associations);<br>d) local communities in coastal and island areas of importance for cetaceans;<br>e) schools in coastal and island areas of importance for cetaceans;<br>f) recreational fishermen, divers, owners of sailing boats, inflatables, yachts;<br>g) regional NGOs;<br>h) scientific and conservation communities;<br>i) general public;<br>j) media;<br>k) shipping, marine transportation and tourism sectors;<br>l) management bodies of MPAs; | Targets defined and listed for each sector:<br>a) Central government officials identified, personal contacts established.<br>b) Regional authorities in areas most important for cetaceans (see Objective 3) identified, personal contacts established.<br>c) Fishing confederation and relevant federations leadership identified and contacted; associations relevant to areas most important for cetaceans (see Objective 3) contacted.<br>d) At least one local community from the five main areas indicated as important for cetaceans (Amvrakikos Gulf, Gulf of Corinth, Hellenic Trench, Inner Ionian Sea, and Thracian Sea), together with main schools, identified; contacts with relevant officials and teachers established.<br>e) Directory of recipients of nominal awareness action from sectors of society likely to be relevant to cetacean conservation in Greece is created, including: members of Parliament, various users of the sea (recreational fishermen, divers, pleasure boaters etc.), NGOs, scientists, journalists. | |

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| | m) policy makers, politicians and decision makers. | | |
| | 1A.2. Define a communication rationale (i.e., why protect cetaceans) and include in the communication strategy information (tailored to the different target groups) on the campaign goals (e.g. long-term viability of cetacean populations in Greece is under threat from prey depletion and ecosystem damage caused by overfishing, incidental mortality in fishing gear, intentional takes, ship strikes, disturbance, pollution, noise, ecosystem change). | Communication rationale and strategy defined. | |
| | 1A.3. Define the actions necessary and specific to both the need of conserving cetaceans in Greece and to the target audience identified) that will enable the objective to be achieved:<br>a) awareness;<br>b) advocacy;<br>c) education;<br>d) capacity building (see 1D);<br>e) engagement. | Action plan (including timetable) defined for building public awareness, organise advocacy for cetaceans, improve education, build capacity, improve engagement. | |
| | 1A.4. Define what is to be achieved in terms of progress towards solving the cetacean conservation problems identified (i.e. the message of the information and communication campaign will coincide with the structure – goal and objectives – of this Strategy). | Progress to be achieved defined, inclusive of progress towards solving the identified cetacean conservation problems. | |
| | 1A.5. Implement the awareness campaign based on elements acquired under Sub-actions 1A.1 to 1A.4. | Awareness campaign implemented. | |

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| 1B. Monitor the awareness campaign impact on the main target audience and on the cetacean conservation problems targeted. | 1B.1. Assess the direct effect of management and legislative actions adopted and implemented by central and regional public authorities regarding conservation of cetaceans and marine environment. | ➢ Existing policy and legislation implemented at regional, national and local level.<br>➢ Relevant new legislation towards improving, directly or indirectly, the conservation of cetaceans in Greece initiated, developed, introduced and passed.<br>➢ A more active and environmentally friendly attitude demonstrated (through the results of questionnaires conducted as part of these activities) by members of key targeted audiences and stakeholders participating in the educational activities, advocacy seminars and training sessions.<br>➢ New initiatives developed by local authorities or other stakeholders for the conservation of cetaceans and for the marine environment as a whole. | Needs definition of benchmark at beginning of awareness campaign implementation. |
| | 1B.2. Assess impact on public opinion through surveys. | ➢ A measurable change in the level of awareness of the targeted audiences regarding the cetaceans species existing in Greece, the threats they face and the necessary conservation actions that will ensure their long-term viability.<br>➢ A measurable change of the targeted audiences towards a more environmental friendly attitude and behaviour. | Needs definition of benchmark at beginning of awareness campaign implementation. |
| 1C. Build capacity relevant to communication, education and awareness. | 1C.1. Ensure that cetacean conservation is appropriately addressed at the local level and that local actions are coordinated and in accordance with the Strategy, e.g., by supporting local NGOs in the development of communication skills and conduction of activities targeting tourists in areas containing cetacean critical habitat. | Local NGOs in areas containing cetacean critical habitat employ communication personnel trained through the awareness campaign. | |
| | 1C.2 Promote the establishment and coordination of NGOs relevant to cetacean conservation, and ensure that actions by advocacy organisations are based on accurate, objective background information grounded on solid science. | Yearly meetings with relevant NGOs organised. | |

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| | 1C.3. Build capacity within academic and educational institutions (at university and school levels) relevant to cetacean conservation, through the identification of relevant institutions and the organisation and implementation of specific courses. | ➢ Relevant institutions identified.<br>➢ Specific courses designed.<br>➢ Training implemented. | |

| **Objective 2.**<br>***Cetacean conservation measures are legally adopted and effectively implemented throughout national waters*** | | | |
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| **Action** | **Sub-action** | **Indicators of achievement** | **Notes** |
| 2A. Cetacean conservation efforts as detailed in this Strategy are integrated within wider marine conservation and management actions and measures, particularly as far as the implementation by Greece of the EU Marine Strategy Framework Directive is concerned. | | ➢ Relevant issues of the cetacean conservation strategy included in national marine policies<br>➢ Cetacean Conservation Strategy integrated in the Greek Marine Strategy | |
| 2B. Strengthen the national institutional framework. | 2B.1.Development of specific institutional capacity within governmental agencies to increase effectiveness of cetacean conservation policy and measures in Greece. This will involve addressing the problem of implementation and enforcement of legal provisions relevant to cetacean conservation in Greece. | ➢ Cetacean specific existing policies implemented<br>➢ New cetacean specific policies introduced and implemented<br>➢ Relevant existing legislation enforced | |
| | 2B.2. Development of a nation-wide stranding network by interfacing with the existing one dedicated to monk seals (possibly also joining efforts with the marine turtle conservation community). Data to be entered into a dedicated central database (publicly available via the internet), in strict coordination with the relevant regional, European and international initiatives. Promote investigations of stranding causes, and provide research material and specimens useful for conservation purposes, to be deposited in appropriate, centralised tissue banks (national or ACCOBAMS; to be harmonised with actions 4D.1 and 4F.3) | ➢ National stranding network, modelled on the existing monk seal Rescue and Information Network, operated by MOm in Greece, implemented and effective in full cooperation with the competent governmental authorities.<br>➢ Dedicated centralised stranding database established and funded by national authorities. Information made available online and easily retrievable through a user-friendly interface, interconnected with the relevant regional, European and international initiatives.<br>➢ Tissue bank established and functioning, modelled on the existing MOm's monk seal tissue bank, and linked with Padua University tissue bank.<br>➢ Communication sent (via the MARMAM list and on an ad hoc basis) to main institutes and scientists involved in marine mammal health issues, to inform about the existence of database and tissue bank, and stimulate organised investigations on marine mammal | |

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| | | mortality in Greek waters. | |
| 2C. Create an Advisory Committee to support the Strategy implementation process. | | ➢ Terms of Reference for Advisory Committee defined.<br>➢ Advisory Committee created and operant. | |
| 2D. Engage different fishery organisations (small-scale, medium-scale) at various levels (local, national) in cetacean conservation efforts. | | Agreement reached between relevant fisheries organisations (in particular those identified under 1A.1.c), NGOs and national authorities on how to address specific cetacean conservation problems involving fisheries, based on the advice of the Advisory Committee. | |
| 2E. Develop a plan and promote its adoption by the maritime sector to prevent ship collisions with large cetaceans (particularly sperm whales) across the Hellenic Trench. | | ➢ Mitigation Plan, developed in collaboration with the Advisory Committee and with ship strike working groups currently active within ACCOBAMS and the IWC, adopted by the Maritime sector.<br>➢ Specific ship collision mitigating measures implemented by the maritime sector and related government and international bodies. | |
| 2F. Compile a list of areas of critical cetacean habitat and promote a ban of military manoeuvres involving the use of high-energy sonar, by the Greek relevant government authorities (i.e. Ministry of Defence), and a ban of oil & gas exploration involving the use of high-energy sound (i.e. Ministry of Industry/Development). | | ➢ List and mapping of critical habitat compiled, based on sound propagation models and on precaution.<br>➢ Proposals for no-noise zones formulated and presented to relevant government bodies. | |
| 2G. Develop a regulatory mechanism to mitigate the negative impacts of irresponsible/unregulated cetacean watching, which may possibly result in habitat loss for cetaceans and promote its adoption and implementation by the relevant Greek authorities (i.e. Ministry of Tourism and Ministry of Development). | | ➢ Inventory of commercial cetacean watching operations in Greece completed.<br>➢ Regulatory mechanism formulated in collaboration with the Advisory Committee based on ACCOBAMS whale watching guidelines.<br>➢ Regulatory mechanism adopted by the relevant government bodies. | |
| 2H. Protect cetacean critical habitat in the coastal areas identified through actions related to Objective 4 as containing cetacean critical habitat, address the problem of degradation | | ➢ Comprehensive management plans developed, in consultation with the Advisory | |

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| deriving from development (tourism, coastal construction, aquaculture etc.) through the adoption of stricter regulations relative to disturbance, introduction of sewage and runoff from urban areas, solid debris, included if necessary *ad hoc* area specific management and mitigation measures. | Committee, in relevance to the areas identified.<br>➢ Adoption and implementation of management plans by the relevant national, regional and local governmental authorities.<br>➢ Relevant local communities (1A.1.d) engaged in the management plans implementation. | |
| 2I. Address the potential problem of oil pollution in cetacean critical habitat by determining the overlap between cetacean critical habitat identified through actions defined under Objective 4 and areas of intense oil tanker traffic (e.g. in relation to the imminent opening of the Alexandroupolis oil terminal and connected traffic through the Aegean Sea), and develop pollution prevention measures were appropriate, as well as a contingency plan for an emergency response mechanism for oil-spill disasters relevant to cetaceans (individuals and critical habitat). | ➢ List and mapping of critical habitat compiled, based on existing information on tanker traffic in Greek seas and on precaution.<br>➢ Contingency Plan for emergency response relevant to cetaceans formulated in consultation with the Advisory Committee.<br>➢ Contingency Plan integrated by the relevant authorities with similar plans relating to other components of biodiversity (e.g., birds) and with existing oil pollution prevention measures. | |
| 2J. Ensure that illegal fishing practices, especially those having a direct negative impact on cetaceans or on cetacean critical habitat (i.e. the use of dynamite fishing) are prosecuted and the relative legislation is fully enforced. | ➢ Increase in percentage of illegal fishing cases that are prosecuted.<br>➢ Increase of media coverage of successes and failures of the prosecution of illegal fishing activities.<br>➢ Study conducted in consultation with the Advisory Committee on assessing new or alternative legal tools and procedures and technological means for improving the location, identification and prosecution of illegal fishing activities.. | |

| **Objective 3.**<br>***Areas containing critical cetacean habitat in Greece are identified, legally protected and organised into a functional network of marine protected areas*** | | | |
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| **Action** | **Sub-action** | **Indicators of achievement** | **Notes** |
| 3A. Promote the adoption and implementation of effective management measures to preserve the environment of the Amvrakikos Gulf. | Design and implementation of a Management Plan that will include measures such as:<br>➢ Restore water input from rivers and water exchange with the open sea.<br>➢ Curtail anthropogenic pollutants and nutrients from agriculture, industry and city wastewaters.<br>➢ Prevent illegal fishing.<br>➢ Manage fish farming activities to avoid pollution. | ➢ Water quality in the Amvrakikos measurably improved.<br>➢ No illegal fishing in the area. | Additional information provided in the Annex. |
| 3B. Protect cetaceans in the Gulf of Corinth. | ➢ Identify existing and potential threats to cetaceans.<br>➢ Investigate the genetic isolation of striped dolphins and short-beaked common dolphins.<br>➢ Conservation measures elaborated, and If appropriate, develop proposal for the establishment of an MPA. | ➢ Threats to cetaceans in the area identified<br>➢ Population structure and degree of genetic isolation of striped dolphins and short-beaked common dolphins described.<br>➢ Cetacean conservation proposals submitted to relevant national authorities | The creation of a MPA in the Gulf of Corinth has been formerly proposed by Greenpeace. |
| 3C. Protect cetaceans along the Hellenic Trench. | Design and implementation of a Management Plan that will include actions to protect sperm whales and Cuvier's beaked whales such as:<br>• the immediate cessation of all seismic and military sonar activities, and<br>• the introduction of shipping regulations aimed to mitigate the risk of collision.<br>• the reduction of solid debris disposal (plastic bags etc) | ➢ Management plan completed and submitted to relevant national authorities. | Linked with 2E (involvement of the shipping sector) and 2F (protection of cetacean critical habitat from man-made noise). |

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| 3D. Protect cetaceans in the Inner Ionian Sea. | Promote the establishment of an MPA in the Inner Ionian Sea, either through a fishery reserve, or through the transformation of the SCI designation into a SAC. Adoption and implementation of already proposed conservation measures, especially related to fisheries, such as:<br>• Strict enforcement of national legislation and of Council Regulation 1967/2006, and appropriate penalties for illegal fishing.<br>• Immediate temporal restrictions on purse seining (allow May to October only) and trawling (November to March only).<br>• Implement ban on beach seining.<br>• Increase minimum mesh size of bottom-set nets.<br>• Cap current fishing capacity in the Natura 2000 site.<br>• Restrict and regulate recreational fishing to minimise impact on the ecosystem. | ➢ Fishery reserve or SAC formally established.<br>➢ Fishing regulations effectively enforced. | Linked with 2D (involvement of the fisheries sector).<br>Additional information provided in the Annex. |
| 3E. Protect short-beaked common dolphins and harbour porpoises in the Thracian Sea. | ➢ Conduct targeted research actions in the area to describe the status and ecology of cetacean populations,<br>➢ Identify existing and potential threats to cetaceans.<br>➢ Recommend measures to protect short-beaked common dolphins and harbour porpoises in the Thracian Sea, on the basis of identified threats, which may involve the proposal for the formal establishment of a cetacean MPA. | ➢ Status of cetacean populations in the area of the Thracian Sea determined.<br>➢ Threats to cetaceans in the area identified and described.<br>➢ Scientific knowledge regarding the status of cetacean populations in the area of the Thracian sea published.<br>➢ If appropriate, MPA proposal completed: stakeholders engaged, proposal submitted to competent authorities. | |
| 3F. Develop cetacean conservation actions in other areas, where preliminary information exists on the presence of important cetacean habitat. | ➢ Conduct targeted research, that will allow the formulation of specific conservation actions in the following areas:<br>• Saronikos Gulf;<br>• Cyclades;<br>• Dodecanese; | ➢ Status and ecology of cetacean populations in these areas described in sufficient detail to develop proposals for conservation measures.<br>➢ Threats to cetaceans in these areas identified and described.<br>➢ If appropriate, MPA proposals drafted and | |

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| | • North-eastern Aegean;<br>• Northern Evvoikos Gulf;<br>• Pagasitikos Gulf;<br>• Northern Evvoia Straits;<br>• Myrtoon Sea;<br>• waters adjacent to the Halkidiki peninsula;<br>• Anatolian Trench;<br>• waters comprised amongst Skyros, Evvoia and the Northern Sporades (NW Aegean).<br>• Northern Sporades (including within the boundaries of the National Marine Park of Alonissos and Northern Sporades, where measures to protect cetaceans are to be incorporated into the Park management plan where appropriate); | submitted to relevant national authorities, including elaboration of corresponding management plan. | |
| 3G. Promote the establishment of a functional network of cetacean MPAs. | ➢ Facilitate meetings to bring together regularly MPA managers and local stakeholders to exchange views, share experience and discuss common challenges.<br>➢ Encourage MPA managers to develop relevant plans of action for cetaceans for each MPA and for the network as it develops.<br>➢ Promote exchanges and communication between cetacean MPA managers and non-specific MPA managers at the national as well as at the regional (Mediterranean) level.<br>➢ Ensure that cetacean MPA managers participate in the broader Mediterranean-wide MPA managers network (MedPAN).<br>➢ Recommend that national authorities establish and maintain link with international, European and regional agencies to ensure that the effort conducted at the national level within the auspices of this Action Plan is conducted in close coordination with wider efforts of | ➢ Cetacean protected areas are linked together into a functional network of MPAs.<br>➢ Cetacean MPA managers develop relevant plans of action for cetaceans for each MPA.<br>➢ MPA managers and local stakeholders meet regularly to exchange views and share experiences.<br>➢ MPA managers participate in the broader Mediterranean-wide MPA managers network (MedPAN).<br>➢ Link at national level with relevant regional, international and European efforts established and maintained. | |

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| | establishing Mediterranean networks of MPAs.<br>➢ The Advisory Committee (2C) will play a key coordinating role in the establishment and functioning of the network. | | |

| **Objective 4.**<br>***Knowledge of cetacean ecology and biology important for the conservation of the species is secured*** | | | |
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| **Action** | **Sub-action** | **Indicators of achievement** | **Notes** |
| 4A. Undertake field surveys (vessel-based and/or aerial line transect, and application of spatial modelling to data analysis) in relevant portions of the Greek seas to identify hotspots of cetacean occurrence (in particular in the Thracian Sea, the Saronikos Gulf and adjacent waters, the Cyclades, the Dodecanese and the Myrtoon Sea, as well as in the area of the Rhodes Gyre during spring; see Section 5.3 for greater details). | | Surveys conducted, cetacean hotspots identified. | Linked to 3F. Such surveys should be best conducted in the context of a wider effort undertaken by ACCOBAMS across the entire Mediterranean basin. |
| 4B. Initiate or continue studies of population abundance, trends and structure as well as habitat use and movement patterns of cetacean population units of conservation importance. | 4B.1Northern Aegean harbour porpoises, particularly to define population status and relationship to Marmara Sea and Black Sea conspecifics. | Knowledge of population abundance, trends and structure as well as habitat use and movement patterns of Thracian Sea harbour porpoises advanced. | Linked to 3E. |
| | 4B.2. Aegean short-beaked common dolphins, particularly to define population status and understand relationship to Ionian, Corinthian and Marmara/Black Seas conspecifics. | Knowledge of population abundance, trends and structure as well as habitat use and movement patterns of Aegean short-beaked common dolphins advanced. | Linked to 3E. |
| | 4B.3. Striped dolphins, short-beaked common dolphins and common bottlenose dolphins in the Gulf of Corinth, to define abundance, status, trends and potential for genetic isolation (including genetic bottleneck or founder effect). | Knowledge of population abundance, status, trends and structure as well as habitat use and potential for genetic isolation of Gulf of Corinth delphinid species advanced. | Linked to 3B. |
| | 4B.4. Common bottlenose dolphins in the Amvrakikos Gulf, to define status and degree of genetic isolation. | Status, trends and degree of genetic isolation of common bottlenose dolphins in the Amvrakikos Gulf defined. | Linked to 3A. |
| | 4B.5. Sperm whales and Cuvier's beaked whales in the Hellenic Trench, to define abundance, status, trends, critical habitat, and degree of genetic isolation. | Abundance, status and trends of sperm whales and Cuvier's beaked whales in the Hellenic Trench defined. | Linked to 3C. |

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| 4C. Investigate cetacean – fisheries ecological interactions. Promote research on ecosystem and food-web dynamics, to be conducted in cooperation with fishery scientists having local knowledge, to obtain information on the direct and indirect impacts of fishing on cetacean conservation. | | Trophic relationships and fisheries interactions of short-beaked common dolphins and common bottlenose dolphins in the Inner Ionian Sea understood, to inform ecosystem-based fisheries management.<br>Trophic relationships and fisheries interactions of common bottlenose dolphins in the Amvrakikos Gulf understood, to inform ecosystem-based fisheries management.<br>Trophic relationships and fisheries interactions of common bottlenose dolphins in the Evvoikos Gulf understood, to inform ecosystem-based fisheries management.<br>Trophic relationships and fisheries interactions of striped dolphins, short-beaked common dolphins and common bottlenose dolphins in the Gulf of Corinth understood, to inform ecosystem-based fisheries management. | Linked to 2D, 3A and 3B. |
| 4D. Investigate 1) occurrence of incidental mortality (bycatch) of cetaceans in fishing gear, and 2) occurrence of fishing gear and fish farms damage and/or depredation (either real or perceived), possibly triggering intentional kills or harm to cetaceans. | 4D.1. Regularly monitor stranding records to detect and investigate fishery-related mortality. | Fishery-related mortality statistics (also derived from the nation-wide stranding record) regularly compiled. | Linked to 2B.2. |
| | 4D.2. Perform ad-hoc in-depth studies where and if hotspots of intentional or unintentional killings are detected. | Hotspots of intentional or unintentional fishery- or aquaculture-related cetacean mortality identified and assessed. | |
| 4E. Scientific capacity building. | 4E.1. Promote the establishment of curricula relevant to cetacean conservation science in academic and professional institutions in Greece. | Cetaceans conservation specific curricula established by Hellenic academic institutions. | |
| | 4E.2. Promote the development of opportunities for professional growth to national researchers, and facilitate the process of publication of cetacean studies. | Cetacean research positions established and filled within Greek academic and research institutions.<br>Scientific publications of Greek cetacean researchers increase. | |
| | 4E.3. Seize the opportunity provided by sighting surveys and stranding networks to promote collaboration among individual scientists, government agencies and NGOs, | Increased participation of GOs and NGOs to sighting surveys and stranding networks. | |

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| | and facilitate capacity building. | | |
| | 4E.4. Organise and conduct on-the-job training courses on field techniques (e.g., photo-identification, surveys) to enable fledgling research teams to collect rapidly meaningful data. | Increased number of field courses organised.<br>Increased number of scientific groups performing research on cetaceans. | To be promoted and facilitated with special reference to areas listed under 3E and 3F. |
| | 4E.5. Plan and fundraise for a National Cetacean Conservation Conference to occur before 2015, to provide a forum for national and foreign experts to discuss current knowledge within the cetacean science community, with experts from different disciplines, with stakeholders, managers and policy makers. | National Cetacean Conservation Conference organised. Proceedings publicly available. | |
| 4F. Funding capabilities. | 4F.1 Promote the explicit inclusion of cetacean oriented research and conservation in Government Aid Agencies funding mechanisms. | Cetacean research and conservation included in Government Aid Agencies funding mechanisms | |
| | 4F.2 Encourage private funding institutions to support cetacean research and conservation activities. | Cetacean research and conservation projects funded by private bodies | |

# 9. Revision of the Strategy and Action Plan

A mid-term assessment of the implementation of the Strategy and Action Plan should be performed in **2012**, to assess up-to-date attainment of objectives within the Strategy's timeframe and to identify, if needed, moderate adjustments.

A comprehensive review of the Strategy's accomplishments and failures will be conducted in **2015**, based on the indicators presented in the Implementation Table, with a consideration for potential actions to be taken beyond 2015.

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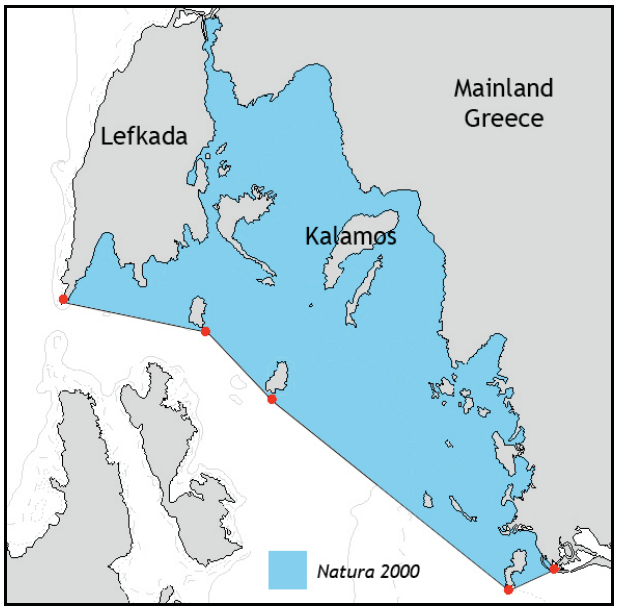
## Annex: Management needs for areas of special conservation importance for cetaceans where the needed conservation measures have been identified and immediate management action must be taken

**Inner Ionian Sea Archipelago** (Natura 2000 site)




The waters of the Inner Ionian Sea Archipelago - a Natura 2000 Site of Community Importance (GR2220003) - are one of the last places where common dolphins can be found in the central Mediterranean Sea. In 2002 ACCOBAMS recognised that pilot conservation and management actions should be developed and implemented immediately to preserve common dolphin habitat in this area. In the ACCOBAMS' Conservation Plan for Mediterranean common dolphins, these waters were identified as an area of high conservation importance. The significance of protecting common dolphins in the Inner Ionian Sea Archipelago was also highlighted in the IUCN 2002-2010 Conservation Action Plan for the World's cetaceans.

Notwithstanding these designations, common dolphin numbers decreased from 150 to only 15 animals in ten years. Large tuna also declined dramatically in the Inner Ionian Sea Archipelago. Evidence shows that the decline of common dolphins and tuna was caused primarily by prey depletion resulting from overfishing, which has resulted in significant ecosystem damage and loss of biodiversity. Most of the impact is caused by a relatively small number of industrial boats, particularly purse seiners. Trawlers and beach seiners are also relatively few, but are known to cause significant ecosystem damage.

The Inner Ionian Sea Archipelago is an important spawning area for epipelagic schooling fish and a nursery area for hake, making this Natura 2000 site a candidate for special protection based on EC Regulations for the sustainable exploitation of fishery resources in the Mediterranean. In addition to common dolphins, the area is home to a resident community of bottlenose dolphins. Endangered species such as monk seals and loggerhead sea turtles are also regularly sighted. All these species are included in Annex II to the Habitats Directive. Fishery management measures are needed to reduce current over-exploitation, protect the local biodiversity, ensure continued ecosystem services, achieve sustainability, and allow for the recovery of endangered marine megafauna.

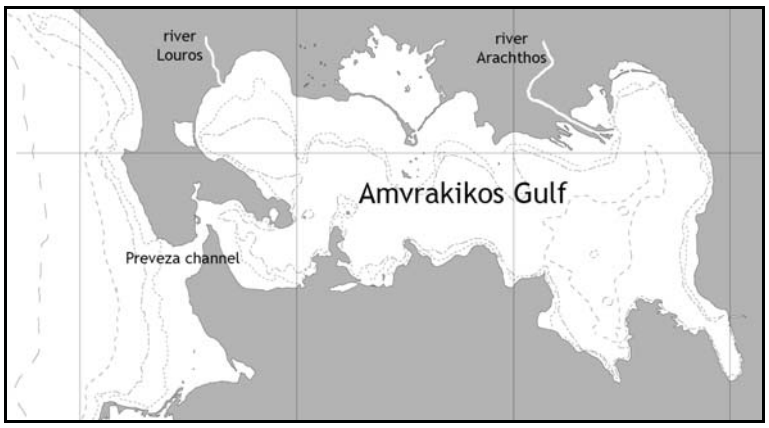
**Management measures**

With reference to Council Regulation (EC) No 1967/2006 and considering that fisheries management measures within Natura 2000 sites are possible under the Common Fisheries Policy, this Strategy recommends that the following urgent action is taken: 1) strict enforcement of national legislation and of Council Regulation 1967/2006, and appropriate penalties for illegal fishing; 2) immediate temporal restrictions on purse seining and trawling, to ensure that these fisheries are fully sustainable and do not harm the ecosystem and its biodiversity, as well as endangered dolphin populations (either directly or indirectly). In addition to existing regulations, purse seining should only be allowed from May to October, trawling from November to March; 3) prompt implementation of the ban of beach seining by May 31st, 2010, as demanded by Council Regulation 1967/2006 (beach seining is known to devastate ecosystems and has been banned in most EU Countries); 4) adoption of larger mesh size for all bottom-set nets than what is being used by coastal fishermen (current practice is 20-22 mm knot-to-knot minimum), in order to increase selectivity; 5)

current fishing capacity in the Natura 2000 area should not increase; 6) restrictions on recreational fishing, which should be carefully regulated to minimise impact on the ecosystem, according to the available scientific evidence.

Benefits of the proposed management actions include: 1) the sustainability of fisheries; 2) the protection of an important fish spawning area; 3) ecosystem recovery; 4) increased biodiversity and ecosystem services; 5) increased aesthetic and cultural value of the area; and 6) increased opportunities for sustainable nature tourism, such as coastal fishing tourism.

**Amvrakikos Gulf** (National Park)




The Amvrakikos has a high abundance of bottlenose dolphins and loggerhead sea turtles and represents a unique natural laboratory for ecosystem-oriented research. Local density of dolphins is among the highest recorded anywhere in the Mediterranean Sea, but this is not indicative of favourable conservation status or pristine habitat. On the contrary, these dolphins face a very high risk of extinction due to their reproductive isolation, small population size and small extent of occurrence, as well as to acute and growing anthropogenic impacts in their semi-closed shallow habitat.

Bottlenose dolphins living in the Amvrakikos Gulf meet the IUCN criteria for classification as Endangered (Bearzi et al. in review), implying a 'very high risk of extinction in the wild' (IUCN 2001). Appropriate management of human impact informed by scientific evidence and inspired by the precautionary principle is an obvious way of reducing such a risk.

Despite numerous designations theoretically intended to protect the Amvrakikos Gulf, the management measures currently in place cannot solve the acute problems faced by this vulnerable ecosystem. Growing habitat degradation is already affecting marine biodiversity and local fisheries to a considerable extent, and it may soon jeopardise the survival of bottlenose dolphins. Water quality in the Amvrakikos Gulf has worsened due to pollutants carried by the rivers Louros and Arachthos and wastewaters from coastal cities and industrial/agricultural processes in the broader area. An hydroelectric power dam upstream of the river Arachtos, the use of the rivers' freshwater for agriculture irrigation and industry, and port construction that substantially narrowed the width of the Preveza channel appear to have contributed to altering the Gulf's natural hydrology and hydrodynamics. Furthermore, agriculture, livestock, grazing and fish farming have affected nutrient flows into the Gulf, resulting in increased eutrophication. Anoxia in bottom waters, increased water temperatures, and illegal fishing were listed among the reasons behind the decline of economically valuable shrimps (*Penaeus kerathurus*) and fish resources generally.

**Management objectives**

A series of actions may be taken to improve the rapidly deteriorating water and seafloor quality in the Amvrakikos Gulf, while ensuring continued ecosystem services and biodiversity conservation (Bearzi et al. 2008, in review). These include: 1) restore water input from rivers and water exchange with the open sea; 2) curtail anthropogenic pollutants and nutrients from agriculture, industry and city wastewaters; 3) prevent illegal fishing, particularly trawling (a fishery that is rightly prohibited within the Gulf); 4) monitor and manage fish farming (both in the Gulf and in its tributaries Louros and Arachtos), which may contribute to eutrophication and cause other kind of damage (Goldburg et al. 2001).

Environmental impact assessments should be conducted (and remedial action taken) for works and activities that may alter (or have already altered) the Gulf's natural hydrology, particularly river dams, use of river water for irrigation, and constructions in the narrow Preveza channel. Navigation and pleasure boating in the Gulf, peaking in the summer, should be carefully regulated to reduce disturbance to dolphins. Commercial nature trips in the Gulf must be managed based on strict codes of conduct that take into account the closed nature of this ecosystem, to prevent these activities from becoming yet another threat for the local fauna.