

Action Plan for the Conservation of Cetaceans in Maltese Waters

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¹ This Action Plan was prepared following the general guidelines for preparing action plans on specific biodiversity issues within the framework of the SAP BIO project, set out by the RAC/SPA in Doc. UNEP(DEC) Mediterranean WG. 203/4 -17 April 2002.

1. Description

Cetaceans occurring in the Mediterranean Sea. Twenty one species of cetaceans have been recorded in the Mediterranean Sea, and are listed in Annex 1 (Notarbartolo di Sciara 2002 a). Of these species, however, only eight (fin whale, sperm whale, Cuvier's beaked whale, long-finned pilot whale, Risso's dolphin, common bottlenose dolphin, striped dolphin and short-beaked common dolphin) regularly occur in the basin and are represented by resident populations. All other species occur occasionally or erratically, and consist of vagrant individuals from North Atlantic and Red Sea populations. Considering that conservation measures at the regional level must target populations, conservation concerns should clearly concentrate on the eight regular species mentioned above. In particular, three² of these have been singled out as "priority species" by ACCOBAMS, in view of special concerns for their conservation status; these are the sperm whale, the common bottlenose dolphin, and the short-beaked common dolphin.

Cetaceans occurring in Maltese waters. The Maltese Islands are strategically located within the Mediterranean Sea in a combination of geographical, oceanographic and ecological conditions which favour the presence of a rich cetacean fauna. Malta sits in the middle of the passageway connecting the western and the eastern basins, and the resulting high dynamism of the surrounding waters masses is conducive to high marine productivity. Furthermore, the Maltese Archipelago is bordered by quite deep waters to the east and the shallow African plateau to the west and south, allowing for a variety of different habitats to coexist in a relatively narrow area. As a consequence, all eight cetacean species known to be regular in the Mediterranean occur in the waters surrounding Malta. These species, which are indicated with shaded rows in Annex 1, should be the main targets of active conservation efforts.

In addition, reports exist from the waters surrounding Malta for a number of other cetacean species, which occur only occasionally in the Mediterranean Sea (see also Baldacchino and Schembri 2002). These include the minke whale, *Balaenoptera acutorostrata* (one specimen observed and filmed a few years ago off a cliff of the nearby Italian island of Lampedusa³); the killer whale, *Orcinus orca* (occurring occasionally throughout the Mediterranean basin⁴, and possibly sighted off Malta years ago); the false killer whale, *Pseudorca crassidens* (also found rarely throughout the Mediterranean basin, and in particular in Sicily and of Malta itself⁵); and the rough-toothed dolphin,

² A fourth species, the harbour porpoise *Phocoena phocoena*, concerns a population found in the Black Sea, also sporadically occurring in the Northern Aegean Sea.

³ From the footage, which was taken by Paolo Notarbartolo di Sciara, the species can be readily identified based on the typical balaenopterid shape of body, small size, and prominent white colouration of the upper side of the pectoral fins.

⁴ G. Notarbartolo di Sciara 1987.

⁵ Lanfranco 1969.

Steno bredanensis (a herd of approx. 160 individuals sighted and recorded in the vicinity of Malta years ago⁶).

Threats to cetaceans. Cetaceans are long-lived vertebrates, confined to the highest levels in marine trophic webs, and have a very low reproductive rate. They are thus particularly vulnerable to a combination of threats deriving from various human activities. These typically can be subdivided into two main categories (Notarbartolo di Sciara *et al.* 2002):

A. Mortality and damages⁷ inflicted by human activities:

- 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;
- Accidental takes in fishery activities: mortality or damage 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);
- Collisions and accidents with vessels: mortality or damage inflicted through collisions with the hull, prow, propeller blades, rudder or any other part of a vessel.

B. Habitat degradation and loss:

- Prey depletion: depletion of food resources caused by the direct and indirect effects of fishing activities and overfishing;
- 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 damage deriving from contamination, contact or ingestion of hydrocarbons deriving from oil spills and oil derivatives at sea;
- Ingestion of solid debris: mortality or damage deriving from the ingestion of foreign objects and materials, such as plastic, wood, textiles, etc. (in general obstructing part of the digestive tract);
- Noise: mortality or damage deriving from exposure to impulsive or prolonged man-made sound reaching noxious intensity and/or frequency levels;
- Disturbance: behavioural disruption through intentional or non-intentional approaches, likely to induce long-term effects in the population;

⁶ Watkins *et al.* 1987.

⁷ “**Damage**” is intended as physical trauma, pathological effects, physiological disruption, behavioural disruption, or displacement/extirpation from the species’ critical habitat.

- Ecosystem and climate change: likeliness that the population will be affected by changes in the ecosystem, which may be deriving from climate change or from other man-made factors, including eutrophication, harmful algal blooms, prey depletion resulting from habitat degradation, alien species invasions, etc.
- Epizootics: susceptibility of the population to mass mortality events deriving from the spread of epizootic disease.

Many of such factors may interact with each other, ultimately resulting in compound effects further adding to the overall burden.

Threats to cetaceans in the region. Concentration of human populations and activities around the Mediterranean basin presents considerable threats to the marine and coastal environment, impacting on the structure and function of natural ecosystems and on the quality and quantity of natural resources. The situation is likely to be worsening with increasing pressures on habitats and natural resources through urbanisation, tourism, agriculture, fishing, transport and industry, and growth of demand for infrastructures. The current resident population of the Mediterranean riparian States (450 million) will likely rise to 520-570 million in 2030, and is expected to reach 600 million in the year 2050. The Mediterranean Sea, with a scant 0.8% of the world's ocean surface, is exposed to 15% of the world's commercial maritime traffic and to 30% of the world's total of ship-transported oil. The number of fishing vessels has increased by almost 20% from 1980 to 1992. Marine aquaculture production has grown from 78.000 tonnes in 1984 to 248.500 tonnes in 1996. About 60% of urban waste disposed in the Mediterranean is still untreated, and it is commonly accepted that the rate of introduction of foreign, often noxious substances from land-based sources into this semi-enclosed basin cannot be overcome by its water turnover rate, estimated at approximately 100 years.

As a consequence, threats to cetacean survival deriving from human activities are particularly severe in the Mediterranean region, specially in the coastal zone. Pressure is thus most intense on coastal species, such as common bottlenose and short-beaked common dolphins. However, also pelagic species, such as sperm whales and striped dolphins, can be severely affected. One of the first difficulties encountered in the attempts to solve Mediterranean whale and dolphin conservation problems is the lack of adequate knowledge of population distribution, size, discreteness, trends, and dynamics for any of the cetacean species (Notarbartolo di Sciara and Gordon 1997).

Three species found in the Mediterranean, in particular, were declared "priority species" by ACCOBAMS: the short-beaked common dolphin, *Delphinus delphis* (which has almost disappeared from the Mediterranean), the common bottlenose dolphin, *Tursiops truncatus*, and the sperm whale, *Physeter macrocephalus*. All three species, still found in Maltese waters, should be the subject of special attention in future local conservation effort. This list in part coincides with a list of vulnerable cetacean species provided by Lanfranco and Schembri (1989), in which however other species (e.g., *Pseudorca*

crassidens, *Phocoena phocoena*), now known to occur very rarely, if at all, in Maltese waters, were included.

The complex of threats affecting Mediterranean cetaceans may be relatively reduced in the waters surrounding the Maltese Islands, given the lesser extent of pressure deriving from human activities (e.g., population density, pollution deriving from industrial and agricultural activities, etc.) in the southern portion of the region, as opposed to the north-western portion. However, intense fishing does occur in these waters, while pollution, aquaculture activities, disturbance and coastal development may be elements of concern locally, given the extremely high density of the Maltese human population⁸. Fishing, in particular, may pose threats to the local cetacean populations. Fishing methods adopted in Malta include pelagic long-lining mostly for bluefin tuna (*Thunnus thynnus*) and broadbill swordfish (*Xiphias gladius*), coastal demersal trawling, "lampara" purse seining, inshore long-lining, trammel nets, driftnets and traps. All these fishing methods, including the type of driftnets used in Malta which only involve small-scale, small-meshed nets (De Leiva *et al.* 1998), do not pose a significant threat to cetaceans as far as bycatch is concerned. However, the deployment of large-scale pelagic driftnets just outside Maltese territorial waters by other fleets is not unlikely to affect local cetaceans with high levels of mortality. Furthermore, competitive interactions may occur between small-scale artisanal fisheries and inshore dolphins in the coastal zone, from which cetacean mortality and prey depletion may derive.

Conservation measures at the regional level. The Barcelona Convention "Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean" lists in Annex II ("List of endangered or threatened species") 18 cetaceans. These species are thus protected by all the Parties to the Barcelona Convention that have ratified the Protocol. In addition, an "Action Plan for the Conservation of Cetaceans in the Mediterranean Sea" was adopted by the Parties at their meeting in Cairo in 1991. More recently (2001), the "Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Zone" (also known as "ACCOBAMS") has entered into force under the auspices of the Bonn Convention on migratory species, and provides dedicated, specialised attention to the problems of cetacean conservation in the region.

Conservation measures in Malta. Under the virtue of the powers vested by the Environment Protection Act 1991, the Environment Protection Department has issued a number of legal notices:

- L.N. 77 of 1992 – Marine Mammals (Protection) Regulations-1992
- L.N. 155 of 1997 - Marine Mammals (Protection) (Amendment) Regulations-1997

⁸ Malta ranks fifth worldwide as far as population density is concerned (The Economist Pocked World in Figures, 2002 Edition. Data from 1999).

- L.N. 214 of 2000 - Marine Mammals (Protection) (Amendment) Regulations-2000
- L.N. 123 of 2000 - Marine Mammals (Protection) (Amendment) Regulations-2001

The last three of these notices only have minor amendments regarding the schedule of the species (basically adding on new species) and other minor amendments in the wording of the actual legislation with regards to protection and the fines involved.

Current Maltese law states that “No person shall pursue, take or attempt to take, maltreat or attempt to maltreat, kill or attempt to kill, possess, sell by any method, buy exchange, import or export any species, or any part or derivative of such species, listed in the schedules of these regulations”. Moreover any person who conspires or attempts or aids, abets, counsels or procures any other person to commit any of the above offences shall be guilty of an offence. Persons who possessed specimens before the legislation came into force had to register such specimens with the Director responsible for fisheries within three months from the publication of such regulations (11 August 1992). Any marine mammal accidentally caught by fishermen and landed at the fish market has to be surrendered immediately to the Director of fisheries who shall dispose of it for scientific purposes only. Only the Director may issue permits for the taking and keeping of any specimens listed in the schedule. Any person who commits an offence against these regulations shall on conviction be liable to either a fine of Lm 100 for each specimen, or above Lm 250 but not exceeding LM 1,000 for each specimen or to imprisonment for a term not exceeding two years or to both such fine and imprisonment (according to the most updated L.N. on the fine to be established). The list of species, taking into consideration all the marine mammals regulations, including the amendments, coincides with the list of cetaceans in Annex I of ACCOBAMS and includes 18 species.

At the moment of writing measures are being taken for the transposition of the E.U. “Habitat” Directive into national legislation. In particular, the directive provides protection to cetaceans both in Annex II (which provides a list of species, including *Tursiops truncatus* and *Phocoena phocoena*, whose conservation requires the designation of Special Areas of Conservation, SACs), and in Annex IV which lists animals and plants of community interest in need of strict protection, inclusive of all cetacean species.

Furthermore, since the Environment Protection Directorate administers the legislation concerning marine mammal protection regulations, and since the Director is duty bound to regulate procedures that must be followed in the event of cetacean strandings, a Protocol for cetacean stranding (Code of practice 01/99 - Protocol for cetacean stranding; here give in Annex 6) has been issued.

This protocol, prepared by the Biodiversity Protection Unit of the Environment Protection Department in cooperation, amongst others, with the Marine Life Rescue Team of the Nature Trust and the Biology Department of the University of Malta, specifies that the Environment Protection Department shall be the leading agency in all cases of cetacean strandings, that the Director is responsible for taking decisions on such matters, and that stranded animals are thus the property of the Director. The general objective of the protocol is to regulate the procedures to be followed in case of both live and dead strandings.

In addition, Maltese legislation includes a number of laws designed to curb marine pollution, which contribute to protect cetacean habitats. Under the virtue of the powers vested by the Environment Protection Act 1991 (Act V of 1991), the Environment Protection Department has issued a number of legal notices concerning waste; e.g., Legal notice 128/97 –Deposit of waste and rubble (Fees) Regulations, 1997 which states that only inert material can only be dumped at sea by permission, some 1 nautical mile away from the grand harbour, at a spoil ground for dredges material, having a radius of about 350 metres and centred on Latitude 33° 55.1 N and Longitude 14° 34.0 E. This regulation contains, as an annex, a schedule listing hazardous waste and toxic or potentially toxic chemicals. Other local legislation was issued through the powers vested by the Environment Protection Act 2001 (Act no. XX of 2001).

Other elements of pertinent national legislation include the Code of Police Laws (Chapter 10) Part XX, Section 227, which decrees that: "no person shall leave in any harbour or on any wharf anything which may cause injury to public health, pose a nuisance, or throw anything into the waters of any harbour or into any part of the internal waters or of the territorial waters of Malta any rubbish or dirty liquid which may cause a nuisance".

Coastal waters are being routinely tested for a number for chemicals, and measures are adopted to reduce such chemicals. Some of these are co-ordinated through the Pollution Control Co-ordinating Unit (PCCU) branch of the Environment Protection Directorate, to improve water quality, in particular concerning marine debris and organochlorines, heavy metals, and PCBs, which are known to be particularly harmful to cetaceans.

Furthermore, the conservation status of cetaceans is affected by a number of international treaties, which Malta has accessed or ratified. A list of such treaties, which are directly related to the protection of cetaceans and/or their habitats, is given in Annex 2. Finally, Malta is a ratified member of MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships, 1973 - as amended by the Protocol relating to the International Convention for the Prevention of Pollution by Ships). The Protocol 1 of

MARPOL 73/78 has provisions concerning reports on incidents involving harmful substances and Protocol II on Arbitration. It has the following 5 annexes:

- Annex I: regulations for the prevention of pollution by oil (ratified by Malta);
- Annex II: regulations for the control of pollution by noxious substances in bulk (ratified by Malta);
- Annex III: regulations for the prevention of pollution by harmful substances carried by sea in packaged form (ratified by Malta);
- Annex IV: regulations for the prevention of pollution from sewage by ships;
- Annex V: regulations for the prevention of pollution by garbage from ships.

Although Malta has not yet signed the last two annexes since we do not yet have the set up and facilities required by the IMO, provisions will probably be taken for these annexes to be ratified.

2. Justification

An Action Plan for the conservation of cetaceans in Maltese waters is necessary for several reasons.

First, it is now well known that the presence of threats to cetaceans worldwide (Reeves *et al.* in press), and in particular in the Mediterranean Sea (Notarbartolo di Sciara 2002 b) is evident and pressing. As a consequence, a number of cetacean populations are at risk, and show alarming rates of decline. Concern for this situation is fully justified, because the pressures exerted by humans on the marine environment are increasing. If action is not taken, very likely populations of cetaceans will disappear from the region. ACCOBAMS has identified in short-beaked common dolphins, common bottlenose dolphins and sperm whales the species in greatest danger of disappearing from the Mediterranean.

Second, Maltese territorial waters and the adjacent seas contain important and possibly critical habitats for Mediterranean cetaceans. This is due to the particular geographic location of the Maltese islands, and to the ecological and oceanographic characteristics of the portion of the Mediterranean. Thus an effort to conserve the rich cetacean fauna living in this area (and, in particular, all three ACCOBAMS priority species) is going to provide a significant contribution to marine conservation throughout the region.

Third, lack of knowledge of cetacean ecology, together with a generalised dearth of ability to face the challenges of protecting cetacean populations, conspire to hinder conservation efforts at a regional level. A Maltese endeavour to progress in these aspects will significantly boost regional marine conservation.

Finally, Malta is duty bound both by local and international legislation to conserve and protect marine mammals and to maintain them in a 'favourable conservation status' (proviso XX of the Habitats Directive – Council Directive 92/43/EEC).

However, merely enforcing and abiding to these regulations will not be sufficient to ensure adequate conservation of marine mammals, given the amount and levels of threats affecting them. Furthermore, enforcement alone without adequate public awareness would not guarantee protection, since illegal impacts would still exist. Thus an action plan, which also includes public awareness and other ways of addressing and involving the general public, and in particular sea-users, will be highly beneficial by concurring to create a more aware, concerned and conservation-minded society.

3. Targets

This Action Plan is based on the following two strategic components:

1. The need to acquire science-based knowledge on:
 - a. the cetacean populations that currently inhabit Maltese waters;
 - b. what factors, if any, are threatening such populations;
2. Directions of action, based on the knowledge acquired under (1).

In other words, while on one hand it is necessary to know the “capital” that we wish to protect (the “*what cetaceans?*” question), and to know what factors are eroding, or likely to erode, such capital (the “*what problems?*” question), it is at the same time necessary to develop measures and procedures to solve problems and to conserve the capital (the “*what to do?*” question). We must emphasize that complete and exhaustive answers to “type 1” questions are not needed before proceeding with the “*what to do?*” question, because a great deal of remedial measures can be adopted while the collection of science-based knowledge is in progress. However, it is foreseeable that in an initial phase, while the scientific aspects are being consolidated, actions related to “type 1” questions may predominate over “type 2” in the overall effort. In due course this condition is expected to reverse, with an emphasis on the implementation of increasingly sophisticated actions to address the “*what to do?*” question, while efforts targeting “type 1” questions are progressively reduced to routine monitoring.

Lists of research methods currently used to address “type 1” questions are provided in Annexes 3 and 4.

Actions to conserve cetacean populations should focus on ensuring that: (1) human-induced mortality is sustainable, (2) cetacean habitats are being protected and, if needed, restored, and (3) the capacity and governance framework for cetacean conservation is enhanced (Reeves *et al.* in press). In order to develop measures and procedures to accomplish the above and mitigate threats to cetacean populations found in a given area (the “*what to do?*” question), a range of actions can be envisaged (Notarbartolo di Sciara and Birkun 2002):

1. managing human activities to mitigate negative impacts on cetaceans (see Annex 4);
2. granting special protection to areas containing critical cetacean habitats, through the establishment of *ad hoc* marine protected areas or of special management areas;
3. providing for timely responses to emergency situations;
4. capacity building;
5. promotion of education and awareness programmes.

Based on the tables provided in Annexes 3, 4 and 5, a number of actions were chosen to address the problem of cetacean conservation in Maltese waters in an initial period lasting three years. Such actions are described in full in the following chapter.

It should be noted that the Cetacean Action Plan can benefit from being implemented in conjunction with other national and regional action plans, which also include fisheries or species which can be affected by fisheries (e.g., the action plans on turtles, sharks, groupers), particularly as far as by-catch, accidental catch, and other types of fisheries interactions are concerned. Other synergies may be envisaged with the action plan on the selection of sites as SACs and SPAs, considering that Appendix II of the “Habitat” Directive sets out the identification of SACs for two cetacean species, one of which (the common bottlenose dolphin) is found in Maltese waters (see above, Chapter 1, Conservation measures in Malta).

4. Action Plan

Introduction

Based on the targets outlined in the previous section, this Action Plan lists specific actions and measures to be taken to promote the favourable status of cetaceans in Maltese waters. The choice of actions is based on considerations of priority (i.e., actions that are considered as having a higher priority) and feasibility (i.e., actions that are feasible within an initial period of three years). At the end of this period, a review process is envisaged of the activities, accomplishments, problems and shortcomings, to redirect and reformulate a new set of actions for the next period.

The Action Plan for the conservation of cetaceans in Maltese waters draws inspiration from the principles, objectives, priorities and obligations laid down in the “Action Plan for the Conservation of Cetaceans in the Mediterranean Sea” approved by the Parties to the Barcelona Convention (Cairo, 1991).

Furthermore, this Action Plan follows the principles stated in the Conservation Plan of ACCOBAMS (provided as Annex 2 to that Agreement), and is designed to work in tight synergy with the “Implementation Priorities” approved with Resolution 1.9 by the Parties to ACCOBAMS at their first Meeting (Monaco, February-March 2002).

Action categories

Based on the rationale described in the previous section, where it was stated that actions should be shaped in such a way as to address two interconnected strategic elements (collection of knowledge and adoption of measures), during the first three-year period this Action Plan envisages a number of activities falling into the following four broad categories:

- Research
- Management
- Capacity building
- Education and public awareness

A. Research

General remarks. Already existing scientific efforts at the local level, which are being undertaken by university scientists and promoted by local NGOs (e.g., Vella 2000), should become part of a systematic, organic and nation-wide coordinated effort clearly geared to the collection of data to be used in the conservation endeavour. To facilitate such process, the following elements are considered of primary importance:

- (a) the availability of ship time to conduct the field observations, using a number of appropriate dedicated platforms (e.g., smaller vessels for *ad libitum* distribution and relative abundance cruises, a larger seagoing vessel for line-transect surveys, etc.)
- (b) the availability in Malta of a specialised, continuously updated library carrying the most important cetological texts and journals, equipped with facilities and funds for rapidly obtaining specific articles from the international library circuit when these happen to be locally unavailable (see ACCOBAMS implementation priority n° 16).
- (c) facilitating the participation and integration of Maltese cetologists into the widening scientific cetological community at the Mediterranean, European and international levels, so that the process of data collection, analysis, publication and discussion becomes progressively enlarged, and the efforts shared beyond local circles.

A.1 Systematic survey of the ecology of cetaceans in Maltese waters.

Building on existing, on-going local scientific efforts, a series of cruises should be organised regularly by trained professionals over the whole range of Maltese waters, evenly distributed in time to adequately sample all seasons. It is assumed that the state of basic knowledge which already exists on cetaceans in Maltese waters, partly assembled in the past through the collection of anecdotal information and observations by amateurs, now justifies the effort of gathering first-hand observations by specialists on dedicated cruises. Aims of the cruises are to collect year-round data on distribution and relative abundance of all cetacean species found in the entire area, describe habitat use by such species, and verify the presence in Maltese waters of specific critical habitats. This study may create the bases, in a subsequent period, for the establishment of long-term population studies of specific, resident communities based on photo-identification, acoustic investigations, and telemetry, should such communities be known (or be found) to exist in the area. Furthermore, the study could suggest the feasibility of line-transect surveys, to calculate absolute population sizes of cetaceans found in specific portions of the waters surrounding the Maltese Archipelago. Although observations of all cetacean species will be recorded, special attention will be given to ACCOBAMS Mediterranean priority species (i.e., the short-beaked common dolphin, the common bottlenose dolphin and the sperm whale). The cruises may also present opportunities for the collection of biopsies for genetic and contaminant analyses, and for the use of G.I.S. techniques to represent the data. Expected results from this study will include: distributional maps for the various species, description of seasonal variations in distributional patterns, effort-corrected measures of relative abundance among species, habitat preferences, geographic and temporal trends of relative abundance within species, and the application of specific indicators to monitor trends and detect problems. An appropriate vessel should be dedicated to this study; the vessel can be a seagoing pleasure craft specially equipped to allow data collection and the adequate housing on

board of at least four researchers for a minimum of three days. This research is likely to support in part ACCOBAMS implementation priorities n° 4 (Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species), 7 (Conservation plan for short-beaked common dolphins (*Delphinus delphis*) in the Mediterranean Sea), 8 (Conservation plan for common bottlenose dolphins (*Tursiops truncatus*) in the Mediterranean Sea), 9 (Basin-wide Mediterranean sperm whale (*Physeter macrocephalus*) survey), 10 (Identification of Mediterranean sites of conservation importance for fin whales (*Balaenoptera physalus*) in addition to the Ligurian-Corsican-Provençal (LCP) basin, and assessment of the functional relationships of such sites to the LCP basin with respect to the species' habitat needs) and 11 (Development of photo-identification databases and programmes encompassing the entire Accobams Area).

A.2 Description of cetacean-fisheries interactions in Malta.

In close cooperation with the appropriate national (and regional) fisheries authorities, this study should provide organised, complete information on the following items: (a) range of interactions occurring between Maltese fisheries and aquaculture operations and cetaceans (bycatch, damage inflicted on operations by cetaceans, other types of interactions, possible evidence of depletion of cetacean prey through overfishing, habitat degradation, etc.); (b) description of the cetacean species and populations involved; (c) description of the types of fishery and aquaculture involved; (d) creation of a national cetacean bycatch database. This research is likely to support in part ACCOBAMS implementation priorities n° 2 (Investigation of competitive interactions between coastal dolphins and artisanal fisheries) and 3 (Creation of a cetacean bycatch database).

A.3 Establishment of a permanent National Stranding Programme.

The existing National Stranding Programme (see Annex 6) should be continued, and possibly strengthened, with the following objectives:

- (a) to collect data on the totality of cetaceans found stranded, dead or alive, along Maltese shores, or as floating carcasses at sea, or accidentally entangled in fishing gear. A coordinated, well trained, around the clock intervention team working in close contact with the scientific community should be bolstered. The team will be alerted and directed to the stranding event locations through the existing h/24 information service, in close connection with the national marine surveillance authorities. Awareness campaigns should be conducted to inform the general public about the information service (possibly reachable through a toll-free phone number), to enhance coverage by the programme;
- (b) enhancement of the post-mortem investigative abilities of local veterinarians, anatomists and pathologists, through capacity building and the availability of appropriate facilities, to take full advantage of each stranding opportunity for a better understanding of the causes of mortality of cetaceans in Maltese waters, the

monitoring of the insurgence of epizootics, and the monitoring of the presence of xenobiotic compounds in the tissues of stranded cetaceans.

This research is likely to support in part ACCOBAMS implementation priorities n° 3 (Creation of a cetacean bycatch database), 15 (Support to the implementation of national stranding networks, and their co-ordination into a wider regional network), 17 (Establishment of a system of tissue banks), and 18 (Establishment of a Task Force for special mortality events).

B. Management

General remarks. (1) Management actions are implemented under the impetus of evidence of existing conservation problems. Such evidence is primarily provided by the scientific community, ideally through research actions like those listed under (A). However, in lack of hard scientific evidence, the awareness of the existence of problems may also derive from other sources, such as information provided by non-specialists (e.g., divers, yachtspersons, tourists, fishermen, etc.) and the media. Such type of knowledge may be sufficient to stimulate the Administration's attention and trigger the implementation of *ad hoc* rapid assessments. Since obtaining adequate feedback is a common problem in management, it is important that monitoring programmes be implemented with the co-operation of both the scientific community and the enforcement authorities. (2) When conflict will arise between the need to conserve cetaceans and the continuation of human activities, problems are best faced with the involvement of all stakeholders, and ideally solution should be sought together. (3) Sufficient flexibility should be possible with current regulations, so that they can be modified according to the results of scientific investigations, in accordance with the principles of adaptive management.

B.1 Conflict-solving between cetacean conservation and fisheries interests.

Given the nature and extent of Maltese fisheries (De Leiva *et al.* 1998), conflicts between cetaceans and fishery operations (aquaculture included) in Malta should be expected. Although bycatch numbers may not be very high due to the type of gear used (providing that large-scale driftnets for swordfish are indeed absent from Maltese fisheries), conflicts between coastal dolphins and artisanal demersal fisheries may occur and should be addressed through appropriate management action (see Annex 5). This action should interface closely with A.2 of this Action Plan, as well as with the corresponding ACCOBAMS implementation priorities.

B.2 Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species.

This action may originate from the results of investigations that are the subject of action A.1., to develop and implement pilot conservation and management projects in selected

areas found to contain critical habitats for one or more cetacean species (with a special emphasis on ACCOBAMS priority species). Areas should be selected on the basis of sufficient available knowledge and characteristics of the area allowing the creation of a model, which can then be applied to other similar situations in the Agreement area. Conservation measures should involve the establishment of *ad hoc* protected areas encompassing critical habitat for the target species and the adoption of experimental management plans with the involvement of local people and user groups; measures should include intensive monitoring of the cetacean population, targeted research, regulation of impacting human activities through time or area closures, education efforts directed at the local fishing communities and recreational users, and promotion of more compatible, alternative activities (e.g., whale watching) and resource uses. Given the novelty of the proposed approach, it is suggested that once results from A1 will have indicated that conditions exist, a workshop be organised inviting international experts, international donors and all local stakeholders, to define future action. This action is meant to closely integrate and support ACCOBAMS implementation priority n° 4.

B.3 Participation and support to the ACCOBAMS Task Force for special mortality events.

This action involves the technical expert contribution by Malta to the establishment by ACCOBAMS of a Task Force for marine mammal mortality and special events (implementation priority n° 18), formed by international experts, to face possible future mortality outbreaks, as well as major accidental events affecting cetacean populations or their critical habitats, and to develop intervention protocols and code of conducts to be followed in case of emergency situations.

B.4 Monitoring and control of the eventual development of commercial whale watching or dolphin watching operations.

If research activities (notably those described in A.1) will reveal that whale or dolphin populations are regularly and easily accessible from the Maltese coasts, it is likely that commercial cetacean watching will eventually develop in Malta, as is already happening in several Mediterranean locations (Beaubrun 2002). If such circumstances exist, it is advisable that regulatory action precedes commercial development, at least with a preliminary, “soft” provision of a voluntary code of conduct (see Annex 5). This activity is likely to support in part ACCOBAMS implementation priority n° 1.

C. Capacity building

General remarks. Capacity building in the field of cetacean science and management throughout the Mediterranean basin must be considered a priority objective in cetacean conservation (Notarbartolo di Sciara and Birkun 2002). There is still a substantial disparity in this field among countries throughout the region. However, the recent

history has demonstrated that progress can be gained quickly, considering that today's most "cetologically" advanced Mediterranean nations could have been viewed as illiterate in cetacean ecology and conservation only a couple of decades ago. Accordingly, in this Action Plan, capacity building is considered as the item deserving the highest financial burden.

C.1 Strengthening of a nucleus of complete cetacean scientists capable of independent research.

Support should be provided to the current small number of cetacean scientists active in Malta to create and strengthen a local research team. Exchanges with other European countries, training courses at research field stations, participation to multinational research efforts by selected young scientists should be promoted. Participation to ACCOBAMS implementation priorities n° 12 (Establishment and implementation of a long-term training programme on cetacean research, monitoring and conservation/management techniques and procedures), 11 (Development of photo-identification databases and programmes encompassing the entire Accobams Area) and 16 (Development of a network of specialised bibliographic collections and databases) should be encouraged. Training should include field data collection methods and techniques, stranding data collection, laboratory analysis techniques (contaminants, genetics, pathology, parasitology, stomach contents, stable isotopes, etc.), data handling and analysis, and scientific publication skills (see Annexes 3 and 4).

C.2 Intervention techniques on live strandings and live entanglements.

Live cetacean strandings and entanglements always pose considerable challenges to intervening team, even when the events involve single individuals. Therefore, appropriate training must be ensured before emergencies occur. Investing energies, time and resources in efforts to save a single animal's life, most often with uncertain final results, may seem pointless in view of the goal of preserving the population as a whole. However, such actions may be significant when attempting to rescue individuals belonging to populations likely to be depleted in the Mediterranean (e.g., ACCOBAMS priority species). Furthermore, these actions may carry as well significant value in terms of training and building up of awareness among the general public. Training is needed for the various phases of the intervention: to decide what type of action is the most beneficial, to implement intervention techniques, to follow-up to assess action effectiveness. This activity is likely to support in part ACCOBAMS implementation priorities n° 15 (Support to the implementation of national stranding networks, and their co-ordination into a wider regional network) and 18 (Establishment of a Task Force for special mortality events).

D. Education and public awareness

General remarks. This category of actions is an essential component of conservation. It is often surprising for persons professionally involved and knowledgeable in the fields of cetacean science, management and conservation to discover how little people outside their field knows or is aware of the nature of the problems affecting endangered marine species like cetaceans. Such dearth of awareness often includes non only the general public, but also stakeholders such as fishermen and marine operators in general, enforcement personnel, and even decision makers. Changing this state of things is fundamental if conservation actions are to be fully effective, and yet the effort may take one or even more generations to complete and yield satisfactory results.

D.1 Implementation of periodic and/or permanent information and education programmes.

These should be specifically designed to target and involve:

- the general public
- the school system
- the local media
- special interest groups (fishing community, tourist operators, etc)
- the enforcement personnel (police, coast guard, etc.)
- decision makers.

Each programme should be tailored to the specific group it is meant to target, and may consist of newspaper articles, appearances on radio and television, conferences and workshops, targeted training seminars or stages, and whenever possible involving members of each groups in first hand experiences.

Educational items may include codes of conduct and guidelines designed to minimise disturbance to cetaceans when the public comes in close contact with them. Furthermore, educational films should be produced to teach behaviours and illustrate and explain coordinated intervention techniques and actions to be implemented by the Environment Protection Department in case of strandings and other exceptional events involving cetaceans.

Actions should be best performed by professionally-trained NGOs, working in tight connection with members of the scientific community to ensure reliability of the information provided. All groups must become aware that an efficient organisation permanently exists in the country, devoted to cetacean conservation, which they may resort to for any matter connected with the issue. Appropriate NGOs, or a coalition thereof, should be selected and charged with the preparation of a long-term working

programme. Assistance for such effort can be easily obtained through the help of ACCOBAMS and of international organisations which have been active in this fields for decades. Appropriate indicators should be adopted to monitor progress in terms of awareness for cetacean conservation issues within each group and throughout the country as a whole.

5. Priorities

Given the structure of this Action Plan, in which a selected, limited number of actions was chosen (Chapter 4) among a wide array of possible actions (Chapter 3 and Annexes), based on criteria of urgency and feasibility within an initial period of three years, it is recommended that all described actions be conducted simultaneously, at the same time ensuring that outputs from each action be used to strengthen the others.

Two actions (B2, “Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species”, and B4, “Monitoring and control of the eventual development of commercial whale watching or dolphin watching operations”) must await for their implementation, respectively, results from A1 and indication that whale watching operation are going to be developed in Malta. In this sense they may be considered as having a lower operational priority; however, once conditions for their implementation are found to occur, it is important that also these two actions be attributed a priority status equally high as the other actions.

6. Responsibility

The Environment Protection Directorate within the Malta Environment and Planning Authority will be responsible for the implementation of the action plan. The different activities to be carried out shall be assigned, depending on their characteristics, to the different participants involved. This is the case, for instance, of all research activities that should be carried out by scientific institutions, whereas the ones related with surveillance and control at sea will be the responsibility of the appropriate enforcement bodies.

A number of obligations for the Contracting Parties to the Barcelona Convention, including Malta, derive from the Action Plan for the Conservation of Cetaceans in the Mediterranean Sea, which was adopted at the Seventh Ordinary Meeting of the Parties in Cairo (October 1991): “The Contracting Parties have to take all the necessary measures to ensure a favourable conservation status for cetaceans by protecting them and their habitats from induced and cumulative effects resulting directly or indirectly from activities under national jurisdiction or control.” By implementing all the measures described in the present Action Plan, Malta will be adequately fulfilling such obligations.

7. Stakeholders

National stakeholders having a direct or indirect interest in cetaceans include: the national authorities, the fishing community, the diving and pleasure craft communities, the NGOs, the research community, the teaching community, the media, the tourists and the tourist industry.

National authorities include:

- the Malta Maritime Authority, which can also assist in the effort by providing ship time;
- the Armed Forces (Maritime Squadron) and the Civil Protection, by providing information on cetaceans sightings and helping whenever the transportation of a cetacean specimen is needed;
- the Police, who will intervene in cetacean strandings (see Code of practice in Appendix 6) and ensure that only authorised personnel is involved;
- the Fisheries Department;
- the Veterinary Services Department, under the purview of which examinations and certifications of stranded animals are performed and first aid administered;
- the Administrative Law enforcement section for putting into effect national legislation on cetaceans.

The fishing community includes the people who are most likely to come into contact with cetaceans, either through sightings during normal operations at sea, or in the case of bycatch and competitive interactions. The involvement of fishermen in the monitoring and conservation process is of foremost importance, and considerable effort investment is needed to promote their awareness and stewardship of the marine environment.

Local diving clubs, scuba divers, underwater photographers and pleasure craft owners and operators comprise together a group of important stakeholders concerned with cetacean conservation, and should always be included both in education and awareness campaigns and in involvement initiatives.

Local NGOs should be included in many initiatives of this Action Plan. Some of these, such as the Nature Trust (in particular the Marine Life Rescue Team), are already quite involved in cetaceans conservation and awareness issues at the national level and can provide a significant contribution. Members of this group already have authorisation to be notified in case of a stranding and provide expert assistance during operations. A relevant contribution to the conservation effort should be provide by adequate cooperation between the national authorities in charge of cetacean protection and the

scientific community. In particular, the field research currently carried out at the Biology Department of the University of Malta seems particularly relevant. For optimal results, a cooperative relationship should be strengthened so that scientists are authorised to collect their data and at the same time these data can be used by the Administration to enhance the conservation effort.

Within the tourist community, those that travel to Malta attracted by the country's natural resources, as well as the tourist operators which cater to them, can be considered stakeholders of the Action Plan. In the near future it is foreseeable that tourists may travel to Malta specifically to include dolphin watching or whale watching in their programmes.

Finally, an important category of stakeholders is composed by the school teachers' community and my media operators, who are in a special position for promoting and disseminating information and awareness on cetacean conservation to a growingly receptive audience.

8. Prerequisites for implementation

A set of conditions are listed below, which, if met, will ensure the success of the Action Plan.

- The active participation of the Administration at all levels is a condition of foremost importance. The Administration, and in particular the Environment Protection Directorate within the Malta Environment and Planning Authority, has responsibility of the Plan (see Section 6) and will have a leading role for its implementation. Adequate allocation of human and financial resources will be needed to accomplish this task. The convinced participation to this effort of all appropriate surveillance and control bodies (e.g., Coastguard) will be a crucial component of the success of the Plan.
- All stakeholders (See Section 7) will have to be actively involved in the process. For best results, each of them will need to be motivated to contribute to the success of the Plan through appropriate incentives.
- Stakeholders' involvement will be particularly crucial in those instances in which conflicts between them exist (e.g., fishermen vs. environmental groups, etc.).
- Scientific and technical facilities needed for the implementation of the Plan must be identified, secured and enhanced to need. The selection of existing facilities, deemed to be appropriate for the task, should be encouraged. Mechanisms to ensure adequate maintenance of equipment and instrumentation must be foreseen.
- In addition to management and research actions, that may be seen as efforts which can provide visible results in the short and medium term, capacity building and education/public awareness actions are also essential components of the conservation process. In particular, training programmes will be needed on scientific (survey techniques, necropsies, genetic and contamination analyses) and intervention techniques (emergency situations, first aid, rescue management, rehabilitation, etc.). It is thus important to bear in mind that, although such actions will have effect on the conservation status of cetaceans only in the long term, they must all be implemented simultaneously.
- Furthermore, a mechanism for the periodic assessment of results (see Section 12), also incorporating suggestions from stakeholders, must be in place and followed carefully to provide guidance for the continuation of work and future planning.
- the Administration will ensure that a proper flow of communication and coordination is maintained among the different participants to the Action Plan and all stakeholders in general, and that results from research efforts are being considered in support of the policy making process.

- Funding for all the activities described in the Plan is an essential prerequisite of the success of the Plan itself.
- All the activities conducted within the framework of this Action Plan should be synchronised and framed within the greater effort conducted on a regional basis by organisations such as the RAC/SPA and ACCOBAMS.

9. Expected problems for implementation

As said elsewhere in this document, problems for cetaceans arise essentially from a combination of human activities, which need to be redirected through policy actions in such a way as to allow the continuation of the activities themselves (thereby allowing the economic sustenance of the concerned users), at the same time ensuring the achievement of a favourable conservation status for the cetacean populations affected.

In many respects, this will not be an easy task. Converting any human activity from unsustainable to sustainable will require the availability from the involved peoples and societies to modify their habits to some extent, and perhaps even incur in extra costs or effort in the process. Choices that are easier to make by more affluent societies, may be impossible for others. Often the sole benefit of realising that cetaceans – and the marine environment at large – will ultimately gain through this increased hardship will not be sufficient to convince the involved persons that this policy is right. In this case, other incentives must be excogitated and implemented. Just as an example, the argument that dolphins must not be shot at because they are protected by the law may not be sufficient for a small-scale fisherman who sees his net regularly destroyed by dolphins. However, if a compensation scheme exists to help him in his economical hardship, he may be more inclined to consider the importance of the environmental consideration issues. If, in addition, he will be put in a position of gaining immediate economic advantages from the presence of dolphins in his working area, e.g. by bringing tourists to watch the dolphins from his fishing boat, then his attitude is likely to turn around completely. This type of attitudinal change is, in fact, occurring in many coastal communities.

A remarkable effort will be necessary from the Administration to centralise the data and information collected through the conservation effort, and make it available through a single metadatabase. To obtain this, a fully cooperative and constructive relationship will have to be established between the Administration and all those who will be in charge of collecting the data. This effort should also include an attempt to revise, validate and incorporate pre-existing data and all available useful information into a coherent information system managed by the Environment Protection Directorate.

Funding all the activities envisaged by this Action Plan is also potentially a problem, since the investment required to protect cetaceans must be seen in the wider context of marine environmental conservation, or even environmental conservation tout-court. It may thus seem hard to justify to invest a relatively large amount of money and time in the conservation of just one taxon of marine vertebrates. However, if cetaceans can be

considered “umbrella species”⁹ of a given marine ecosystem, then a greater investment for their conservation will be justified.

⁹ The protection of an "umbrella species" covers a wide range of co-existing species in the same community or ecosystem, which may be lesser known and difficult to protect otherwise.

10. Implementation calendar

Action n°	Title	year one				year two				year three			
		I	II	III	IV	I	II	III	IV	I	II	III	IV
A1	Field survey												
A2	Study of fisheries interactions												
A3	Stranding programme												
B1	Fisheries conflicts												
B2	Management areas ¹⁰												
B3	ACCOBAMS task force												
B4	Whale watching monitoring ¹¹												
C1	Science capacity building												
C2	Live strandings techniques												
D1	Education and awareness												

Preliminary: fund-raising, preparation, assembling of equipment and instrumentation, background information, establishment of necessary contacts, training, permits, etc.



Action execution phase



Data management and analysis



Publication of reports, scientific papers, communication to conferences, etc.



Final assessments of overall results, preparation of next Action Plan phase



¹⁰ Subject to location of suitable areas as a result of studies conducted under A1 (for this reason the beginning of this action was hypothetically placed at the beginning of year 3).

¹¹ Subject to realistic likelihood that whale watching operations will begin in Malta. Thus beginning time of B4 is here placed at the beginning of the second half of the period as an example, but should be moved as appropriate when the necessary information exist.

11. Budget

Please note that: (a) these budgets are provided for indicative purposes only, (b) figures given are in €, (c) salaries are excluded from calculations.

A1. Systematic survey of the ecology of cetaceans in Maltese waters

Ship time (one 20-day cruise every trimester for two years @ 500 €/day ¹² , fuel, insurance and harbour expenses included)	80,000
Instrumentation and equipment (digital camera, data collection computer, desktop computers, software, printers, access to G.I.S., biopsy collection kit, GPS, anemometer, 2 binoculars)	50,000
Professional support	10,000
Consumables	5,000
Miscellaneous (including possible publication fees)	15,000
Total	160,000

A2. Description of cetacean-fisheries interactions in Malta

Communication and travel expenses	16,000
Professional support ¹³	20,000
Equipment (computer, printer, software, website)	10,000
Total	46,000

A3. Establishment of a permanent National Stranding Programme

Travel expenses and transportation of stranded animals to facility (including the purchase of a pickup truck)	40,000
Storage and analysis facilities (including freezers)	25,000
Equipment (computer, printer, software, website)	10,000
Communication	5,000
Professional support	20,000
Laboratory analyses	20,000
Miscellaneous (including possible publication fees)	15,000
Total	135,000

¹² This figure is calculated at the low end of the range, and envisages the use of a small- to medium-sized vessel with a contract engaging her for the longest possible time. The use of a larger research vessel would substantially increase this figure.

¹³ This figure becomes 0 if the action is performed 100% by salaried personnel.

B1. Conflict-solving between cetacean conservation and fisheries interest

Note: It is impossible at this stage to determine whether there may be costs involved with this action. Results from A2 will provide the needed information. If this action will be conducted exclusively by salaried personnel, its costs will be 0.

Total **0**

B2. Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species

Organisational and operational workshop	60,000
Publication and dissemination of results, website	10,000
Total	70,000

B3. Participation and support to the ACCOBAMS Task Force for special mortality events

Travel and communication	10,000
Total	10,000

B4. Monitoring and control of the eventual development of commercial whale watching or dolphin watching operations

Preparation, publication and diffusion of code of conduct	10,000
Total	10,000

C1. Strengthening of a nucleus of complete cetacean scientists capable of independent research

Travel abroad and training fees for 5 selected trainees (2 ecologists, 1 pathologist, 1 toxicologist, 1 computer and instrumentation technician), @ 50,000 each	250,000
Establishment of a specialised library	50,000
Total	300,000

C2. Training on intervention techniques on live strandings and live entanglements

Professional support	30,000
Equipment	20,000
Total	50,000

D1. Implementation of periodic and/or permanent information and education programmes

Professional support	50,000
Conference (1), workshops (2) ¹⁴ , training seminars (3: media, fishermen, enforcement personnel)	70,000
Total	120,000

Budget Overview:

Action n°	Title	Cost
A1	Field survey	160,000
A2	Study of fisheries interactions	46,000
A3	Stranding programme	135,000
B1	Fisheries conflicts	0
B2	Management areas	70,000
B3	ACCOBAMS task force	10,000
B4	Whale watching monitoring	10,000
C1	Science capacity building	300,000
C2	Live strandings techniques	50,000
D1	Education and awareness	120,000
	Total	901,000

¹⁴ Excluding the workshop mentioned in B2

12. Monitoring

In order to monitor and review the effectiveness of the Action Plan, a number of mechanisms should be established.

First, a tight timeframe is incorporated into this Action Plan, to be implemented within a three-year basis. At the end of each period a thorough assessment is envisaged, in order to provide appropriate and updated re-scheduling of the next Action Plan.

Second, each action must be defined (a) by specific objectives, and (b) by specific indicators and/or criteria to enable the evaluation of performance and to assess whether those objectives were met.

Third, to evaluate the overall effectiveness of the Plan, indicators should be devised to assess whether the cetacean populations which are the subject of conservation efforts have benefited or not from such efforts. However, considering the wide-ranging nature of cetaceans, compared to the limited geographic extent of the Mediterranean Sea, identifying indicators of this sort should be best seen as part of a greater effort, to be conducted possibly within the tasks of regional conservation organisations such as the RAC/SPA and ACCOBAMS. It is therefore highly recommended that Maltese officials involved in the implementation of this Action Plan under various capacities and disciplines (e.g., policy, management, science, education, etc.) will be fully involved in such a wider regional effort.

13. Investment portfolio

An Action Plan for the conservation of cetaceans in Maltese waters is necessary, given the well-known threats to cetaceans existing worldwide, and in particular in the Mediterranean (see Section 2). Maltese territorial waters and the adjacent seas contain important and possibly critical habitats for Mediterranean cetaceans. However, lack of knowledge of cetacean ecology, together with a generalised dearth of ability to face the challenges of protecting cetacean populations, conspire to hinder conservation efforts at a regional level. A Maltese endeavour to progress in these aspects will significantly boost regional marine conservation.

This Action Plan is based on the following two strategic components: (a) the need to acquire science-based knowledge on the cetacean populations that currently inhabit Maltese waters, and on what factors, if any, are threatening such populations; and (b) directions of action, based on the knowledge acquired under (a) (see Section 3).

The total cost of this Action Plan for a three-year period (salaries excluded) is € 901,000.

The Action Plan consists of four action categories (see Section 4 for a more detailed explanation): research, management, capacity building, and education and public awareness.

A. Research. Three actions are envisaged: (1) systematic survey of the ecology of cetaceans in Maltese waters; (2) description of cetacean-fisheries interactions in Malta; (3) establishment of a permanent National Stranding Programme.

A1. Systematic survey of the ecology of cetaceans in Maltese waters. At a total cost of € **160,000**, it involves the conduction of a series of eight 20 day cruises in the waters surrounding Malta to determine and describe cetacean presence in such waters and identify seasonal variation in cetacean distribution and relative abundance.

A2. Description of cetacean-fisheries interactions in Malta. This action envisages the collection of information on a wide range of issues on the theme, for a total of € **46,000**.

A3. Establishment of a permanent National Stranding Programme. The envisaged programme involves the strengthening of the current operations and the establishment of a permanent mechanism for the conduction of top-level post-mortem investigations. Total cost for the triennium is € **135,000**.

B. Management. Four actions are envisaged: (1) conflict-solving between cetacean conservation and fisheries interest; (2) development and implementation of pilot

conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species; (3) participation and support to the ACCOBAMS Task Force for special mortality events; (4) monitoring and control of the eventual development of commercial whale watching or dolphin watching operations.

B1. Conflict-solving between cetacean conservation and fisheries interest. At this stage (i.e., before the necessary detail will be provided through the results of action A.2) costs can be only placed at **zero** if conducted exclusively by salaried personnel.

B2. Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species. This action will result from the information collected through research actions. Its cost, determined in **€ 70,000**, consists of a workshop and the dissemination of information.

B3. Participation and support to the ACCOBAMS Task Force for special mortality events. This actions will stem from the participation of Maltese officials to the works of ACCOBAMS; its costs have been estimated at **€ 10,000**.

B4. Monitoring and control of the eventual development of commercial whale watching or dolphin watching operations. This action, which will be triggered by knowledge that commercial whale watching is being developed in Malta, envisages the preparation, publication and diffusion of a code of conduct. Its cost was estimated at **€ 10,000**.

C. Capacity building. Two actions are foreseen: (1) strengthening of a nucleus of complete cetacean scientists capable of independent research; (2) training on intervention techniques on live strandings and live entanglements.

C1. Strengthening of a nucleus of complete cetacean scientists capable of independent research. This action envisages the selection of five young specialists (two ecologists, a pathologist, a toxicologist and a computer/instrumentation technician) to be sent abroad for training (**€ 250,000**), and financial support for the establishment in Malta of a specialised cetological library (**€ 50,000**).

C2. Training on intervention techniques on live strandings and live entanglements. Hard-to gain experience on such delicate and difficult operations is acquired through support from leading experts. Total cost for this action is estimated in **€ 50,000**.

D. Education and public awareness. This category involves the implementation of periodic and/or permanent information and education programmes.

D1. Periodic and/or permanent information and education programmes. These include one national conference on cetacean conservation, two workshops to develop specific themes, and three seminars each targeting media operators, the fishing community, and

the enforcement authorities at sea. Professional communication and educational support should be enlisted for this action. Total calculated cost is **€ 120,000**.

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Annex 1

Cetacean species occurring, or known to have occurred, in the Mediterranean Sea. The shaded rows indicate species that regularly occur in Maltese waters, with individuals belonging to Mediterranean resident populations (adapted from Notarbartolo di Sciara 2002 a).

Scientific name	English name	Maltese name	Notes
<i>Balaenoptera acutomerista</i>	minke whale	a' geddumha ppuntat	Occurs occasionally in the Mediterranean Sea. Confirmed sighting off the island of Lampedusa.
<i>Balaenoptera borealis</i>	sei whale	balieratan-nsi nhar	Very rare occurrences in the Mediterranean Sea.
<i>Balaenoptera physalus</i>	fin whale	balienanbaöda	Confirmed in Maltese waters.
<i>Delphinus delphis</i>	short-beaked common dolphin	del fin komuni	Confirmed in Maltese waters. ACCOBAMS priority species.
<i>Eubalaena glacialis</i>	North Atlantic right whale		Very rare, ancient occurrences in the Mediterranean Sea
<i>Globicephala melas</i>	long-finned pilot whale	baliera sewda	Confirmed in Maltese waters.
<i>Grampus griseus</i>	Risso's dolphin	del fingiú	Confirmed in Maltese waters.
<i>Hyperoodon ampullatus</i>	northern bottlenose whale		A few sightings reported in the Alborán Sea.
<i>Kogia sima</i>	dwarf sperm whale	balieranmmieöra äatt	One individual found stranded in the Mediterranean Sea (coast of Tuscany, Italy)
<i>Megaptera novaeangliae</i>	humpback whale	balieratal-í wienahkbar	Very rare occurrences in the Mediterranean Sea.
<i>Mesoplodon bidens</i>	Sowerby's beaked whale	balierata' Sowerby	Possible rare occurrences in the Mediterranean Sea.
<i>Mesoplodon densirostris</i>	Blainville's beaked whale	balierata' Blainville	Very rare occurrences in the Mediterranean Sea.
<i>Orcinus orca</i>	killer whale	orka	Occurs occasionally in the Mediterranean Sea. Possible, unconfirmed sighting from Maltese waters.
<i>Phocoena phocoena</i>	harbour porpoise	del finiswed	Occurrences in the Northern Aegean Sea reported. Uncertain historical presence elsewhere in the Mediterranean Sea. ACCOBAMS priority species.
<i>Physeter macrocephalus</i>	sperm whale	gabbal	Confirmed in Maltese waters. ACCOBAMS priority species.
<i>Pseudorca crassidens</i>	false killer whale	pseudorka	Occurs occasionally in the Mediterranean Sea.
<i>Sousa plumbea</i>	Indian humpback dolphin	del fin tal-Baöar l-Aónar	Known to stray occasionally into the Mediterranean from the Red Sea.
<i>Stenella coeruleoalba</i>	striped dolphin	sterella	Confirmed in Maltese waters.
<i>Steno bredanensis</i>	rough-toothed dolphin	del fin tal-tikki	Occurs occasionally in the Mediterranean Sea. A herd of about 160 specimens was sighted in the waters adjacent to the Maltese islands (Watkins <i>et al.</i> 1987).
<i>Tursiops truncatus</i>	common bottlenose dolphin	del fin geddumu qasir	Confirmed in Maltese waters. ACCOBAMS priority species.
<i>Ziphius cavirostris</i>	Cuvier's beaked whale	balierata' Kujer	Confirmed in Maltese waters.

Annex 2

An updated adhesion table for the main treaties related to the protection of cetaceans and/or their habitats in the Maltese Islands, in chronological order by date of adhesion

Treaty	Entered into force	Adhesion by Malta	Status
Protocol concerning Mediterranean Specially Protected Areas (SPA Protocol)	23 March 1986	11 January 1988	Ratified
Convention on International Trade in Endangered Species of Wild of Flora and Fauna (CITES)	1 July 1975	17 April 1989	Accessed
Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)	1 June 1982	26 November 1993	Accessed
Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPABIM)	12 December 1999	22 October 1999	Ratified
Convention on Biological Diversity (CBD or Rio Convention)	29 December 1993	12 December 2000	Ratified
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)	3 November 1983	13 February 2001	Accessed
Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)	1 June 2001	13 February 2001	Ratified

Annex 3

Research objectives and methods to investigate cetacean populations (the “type 1a” question)

Research objective	Methods
Provide a list of species occurring in a given area	<ul style="list-style-type: none"> • Stranding record • Opportunistic sighting reports (both of them documented or reported by professionals)
Determine distribution and relative abundance of the different species present in a given area. This includes providing information on the yearly and seasonal variability of distribution and abundance.	<i>Ad libitum</i> dedicated cruises (based on visual and/or acoustic detection)
Describe movement patterns and habitat preferences of a given species in a given area	<ul style="list-style-type: none"> • Use of telemetry tags, combined with • Studies of the physical-chemical environment through remote sensing or <i>in situ</i> oceanographic measurements
Describe eventual subdivision of species in a given area in discrete population units; map geographic distribution and boundaries of each unit	<ul style="list-style-type: none"> • Genetic analysis of tissues from skin swabbing or remotely collected biopsies, combined with • <i>Ad libitum</i> dedicated cruises (based on visual and or acoustic detection)
Describe population structure, population size, ecology, social structure, behaviour, habitat use, critical habitat, demographic parameters, home range, movement patterns of selected species in a given area	Long-term, longitudinal study of cetacean communities using photo-identification, genetics, behavioural sampling, telemetry (VHF, satellite, TDR), acoustics, and eco-toxicological methods
Investigate trophic relationships among the different components of a given ecosystem, including cetaceans	<ul style="list-style-type: none"> • Stomach content analysis on deceased individuals • Stable isotope analysis performed on biopsies and on tissues from stranded individuals • Field observations of feeding behaviour • Multidisciplinary approach to study trophic relationships at different web levels
Determine density and absolute size of a given cetacean population, to monitor yearly and seasonal trends of abundance	<ul style="list-style-type: none"> • Line-transect surveys • Photo-identification based mark and recapture studies

Annex 4

Research objectives and methods to investigate factors threatening cetacean populations (the “type 1b” question)

Research objective	Methods
Describe mortality causes (including from fisheries, vessel collisions and ingestion of solid debris), pathologies and parasites affecting the different species in a given area	<ul style="list-style-type: none"> • Stranding record • Analysis of field photographs of free-ranging individuals
Describe contaminant levels and ability of individuals from a given cetacean population to cope with specific contaminant loads	<ul style="list-style-type: none"> • Toxicological analyses of tissues obtained from stranded individuals or through remotely-collected biopsies • Biomarker studies
Investigate population effects of fishing activities through individual removals (bycatch)	Observer -assessment of fishery-induced mortality levels, to be related to population size with the use of appropriate indexes (e.g., PBR - Potential Biological Removal)
Investigate competitive interactions between coastal fisheries and dolphin populations	Monitor fishery activities and conduct field observations of cetaceans (see Annex 2) in problem areas
Investigate population effects of fishing activities through removal of prey species	Methods are currently being developed to address this difficult question. A combination of knowledge on the ecology and status of fish stocks that are targeted by both fisheries and cetaceans, and on the characteristics of both the fishery (type, effort, etc.) and the cetacean population (size, ecology, feeding habits, trophic level, etc.) involved, is needed for an initial orientation on this problem, and for the application of ecological models.

Annex 5

Managing human activities to mitigate negative impacts on cetaceans

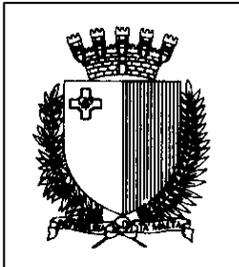
Management item	Impacting factor	Action
Mitigation of the negative effects of interactions with fisheries	Bycatch	<ul style="list-style-type: none"> • Ensure availability of appropriate information through research and monitoring programmes (see Annex 3) • Identify the environmental, biological and technological reasons why bycatches occur • Set bycatch limits above which the fishery is closed • Adopt time/area fisheries closures • Encourage alternative ways of fishing • Promote eco-compatible mariculture as an alternative source of competitive fish products • Introduce and implement regulations to prevent fishing gear from being discarded or left adrift at sea • Promote rescue and release efforts • Promote education and awareness programmes for the fishing community
	Competition between dolphins and fisheries	<ul style="list-style-type: none"> • Ensure availability of appropriate information through research and monitoring programmes (see Annex 3) • Develop management plans to mitigate fishery - dolphin conflicts • Introduce compensation mechanisms for damages inflicted to gear and catch by dolphins • Experiment and test acoustic devices through accurate and rigorous research programmes • Experiment non-acoustic alternative solutions
	Prey depletion through overfishing	<ul style="list-style-type: none"> • Ensure availability of appropriate information through research and monitoring programmes (see Annex 3)
Mitigation of disturbance	Disturbance from vessel traffic and collisions	<ul style="list-style-type: none"> • Ensure availability of appropriate information through research and monitoring programmes (see Annex 3) • Search for solutions aimed at a general decrease of risk in areas containing critical habitats • Search for solutions aimed at increasing the potential by the vessel's crew of detecting and avoiding the whales • Search for solutions aimed at increasing the potential by the whales of detecting and avoiding vessels
	Disturbance from whale watching activities	<ul style="list-style-type: none"> • Ensure availability of appropriate information through research and monitoring programmes • Introduce guidelines and voluntary code of conducts • Introduce top-down regulations, permits • Promote market-driven (bottom-up) control mechanisms
	Disturbance from research and documentation activities	<ul style="list-style-type: none"> • Introduce guidelines and voluntary code of conducts • Introduce topdown regulations, permits
	Disturbance from noise	<ul style="list-style-type: none"> • Ensure availability of appropriate information through research and monitoring programmes • Promote awareness in decision-makers, stakeholders • Search for specific mitigation measures

Annex 4 (Cont'd)

<p>Improvement of the quality of the marine environment</p>	<p>Pollution of the marine environment</p>	<ul style="list-style-type: none">• Ensure availability of appropriate information through research and monitoring programmes (see Annex 3)• Promote research into the effects of the different polluting agents on population health• Implement integrated coastal zone management• Implement international agreements
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Annex 6

Maltese Protocol for Cetacean Strandings



ENVIRONMENT PROTECTION DEPARTMENT
MINISTRY FOR THE ENVIRONMENT

CODE OF PRACTICE 01/99
PROTOCOL
FOR CETACEAN STRANDING

TITLE: PROTOCOL FOR CETACEAN STRANDING

DEFINITIONS

Director means the Director of the Environment Protection Department or his authorised representative, unless otherwise stated;

Cetacean species or **cetaceans** mean any marine mammal representative of the Order *Cetacea* and including whales, dolphins and porpoises;

Stranding means the casting ashore, or in the immediate vicinity of the shore, whether intentional or not, of live or dead cetacean species;

Authorised means authorised by the Director of the Environment Protection Department or his authorised representative.

INTRODUCTION

Strandings of cetacean species occur from time to time on the Maltese Islands. Such occurrences attract a relatively large number of people. In the case of a live animal, it is realised that the latter would be under considerable stress and may need assistance. If the animal is dead, the carcass may be of considerable scientific interest. The need has therefore been felt of regulating such occurrences.

The Environment Protection Department administers Legal Notices 77 of 1992 and 155 of 1997, the Marine Mammals Protection Regulations and the Marine Mammals

Amendment Regulations, respectively. The Director is in duty bound to regulate the procedures that must be followed in the event of stranding of cetacean species.

The following Code of Practice sets out a procedure to be followed under ideal conditions. It is however realised that the actual circumstances under which a cetacean stranding takes place depend on the time and location of the stranding, weather, size, age and species of the animal, etc. Flexibility is therefore necessary in following this Code of Practice.

This Code of Practice has been prepared by the Biodiversity and Protected Species Section of the Environment Protection Department with the collaboration of the Biology Department of the University of Malta and the Marine Life Care Group (Malta).

APPLICABILITY

This Code of Practice applies to all cetacean strandings on the Maltese Archipelago.

GENERAL OBJECTIVE

The general objective of this Code of Practice is to regulate the procedures to be followed in the case of a cetacean stranding.

SPECIFIC OBJECTIVES

The specific objectives of this Code of Practice are as follows:

In the case of a live animal:

- to provide immediate and effective action for the well-being of the stranded animal,
- to provide the rapid assistance to the animal,
- to enable scientific data to be collated.

In the case of a dead animal:

- to enable scientific data to be collated,
- to provide an acceptable method of disposal of the carcass.

PROVISIONS

1. In what follows, any reference to the masculine gender shall also be taken to refer to the feminine gender.
2. The Environment Protection Department shall be the leading agency in all cases of Cetacean strandings. The Director shall therefore be overall responsible for taking decisions on such matters.

3. Any stranded animal, dead or alive, shall be the property of the Director.
4. All cases of stranding of cetaceans should be communicated to the Commissioner of Police.
5. On being notified of a stranding, the Commissioner of Police shall immediately inform the Director who shall appoint an on-site coordinator of operations and relay the notification to the following persons:
 - The Director of Veterinary Services, or his authorised representative,
 - The Head of the Biology Department of the University of Malta, or his authorised representative,
 - The President of the Marine Life Care Group, or his authorised representative,
 - The President of the International Animal Rescue (Malta), or his authorised representative,
 - The Mass Media.
6. The Commissioner of Police shall ensure that only authorised persons enter the site in the immediate vicinity of the stranded animal.
7. The Director of Veterinary Services shall examine the animal and certify whether it is dead or alive.
- 8.
9. The Director of Veterinary Services, shall provide first-aid treatment to the animal, as necessary.
10. In the case of a live animal, the Director of Veterinary Services shall advise whether:
 - the animal should temporarily be kept on site in water;
 - the animal is fit to be taken out at sea;
 - the situation requires that the animal be put down; or
 - any other measures which can be decided upon by the Director according to the prevailing conditions.
11. In the case that the Director of Veterinary Services advises that it is best to keep the animal on site in water, authorised persons may remain in the water to assist the animal.
12. In the case that the Director of Veterinary Services advises that the animal should be taken out to sea, authorised persons may assist in this task.
13. In the case the animal is dead, the Director of Veterinary Services may carry out post-mortem examination, as necessary. Only when the Director of Veterinary

Services has finished with his examination can other authorised persons carry out their examination of the carcass.

14. Both if the animal is dead or alive, authorised persons may approach the animal for the purpose of collating administrative and scientific data, such as measurements, take photographic records of the stranding, tagging and marking, etc.
15. If the animal or the carcass needs to be transported away from the site of the stranding, the animal shall be transported using transport facilities of the Biology Department of the University of Malta or, if this be unavailable, any other authorised facility.
16. The carcass shall be disposed as decided by the Director, in consultation with all the parties concerned.
17. The Director shall be kept fully informed of all activities, including tests, experiments, etc. that take place both on site and away from the site, that are directly or indirectly related to the stranding. In this respect, a copy of all reports prepared in relation to the stranding shall be submitted to the Director within 30 days of the occurrence of the stranding.

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