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The Status and Distribution of Cetaceans in the Black Sea and Mediterranean Sea

Compiled and edited by Randall Reeves & Giuseppe Notarbartolo di Sciara

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Workshop Report - Monaco 5-7 March 2006

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A bottlenose dolphin leaping on the bow wave of a large ocean freighter in the Strait of Gibraltar, 27 March 2005.

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Contents

Preface

On behalf of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and the Convention on Migratory Species (CMS), it is a pleasure for me to introduce this first general assessment of the status of the cetaceans of the Mediterranean Sea.

The ACCOBAMS Secretariat and the IUCN Centre for Mediterranean Cooperation took this initiative following the meeting of the ACCOBAMS Contracting Parties in Palma de Majorca in 2004 that specifically requested the development of closer working relations between IUCN and ACCOBAMS in the frame of their Partnership established since 2002.

We have chosen the theme of species population assessments to initiate our wider collaboration, building on the presence of an IUCN representative within the ACCOBAMS Scientific Committee, and using the standardized IUCN assessment criteria that have been used for many years under the Red Listing process that has been widely accepted by International Conventions and by Governments and the scientific community as a clear and standardized methodology for assessing population status and recording population trends.

ACCOBAMS convened the meeting of twelve experts from the IUCN Cetacean Specialist Group, along with individual experts from the ACCOBAMS Scientific Committee and RAC/SPA in March 2006, to assess the known status of the 10 species of cetaceans known to be regular in the region and the present report is a result of that work.

This is a first step to establishing an agreed regional baseline against which population changes can be measured at a regional scale. The ACCOBAMS Secretariat will be submitting this report to the ACCOBAMS Scientific Committee in November 2006 with a view to seeking its recommendations on how this report can serve the needs of the Agreement and its Parties.

I am pleased to acknowledge the financial support of the Government of Monaco and the CMS Secretariat, as well as of the Junta of Andalucia and the Ministry for Environment of Spain that support the work of IUCN-Med.

Marie-Christine VAN KLAVEREN
ACCOBAMS Executive Secretary

Background and Introduction

The conservation status of cetaceans in the Black and Mediterranean Seas has been a source of concern for many years. This was reflected in the 1991 Action Plan of the Barcelona Convention and in the global action plans for cetacean conservation published by the IUCN (World Conservation Union) Species Survival Commission's Cetacean Specialist Group (CSG) in 1988, 1989, 1994 and 2003. Two populations from the region have already been listed in the IUCN Red List of Threatened Species – the Black Sea subspecies of the Harbour Porpoise (*Phocoena phocoena relicta*) as Vulnerable (1996) and the Mediterranean subpopulation of Short-beaked Common Dolphins (*Delphinus delphis*) as Endangered (2003). Scientists working in the region have long recognised the need for additional detailed assessments, expecting that other species and populations would also qualify for threatened status.

An important development in the history of cetacean conservation in the region was the establishment in 2001 of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) within the framework of the United Nations Environment Programme (UNEP)/Convention on Migratory Species (CMS) (http://www.accobams.org/). At the ACCOBAMS Meeting of Parties in 2004 the decision was taken to seek a closer working relationship with IUCN. As a first step towards implementing that decision, ACCOBAMS welcomed an opportunity to collaborate with the IUCN Centre for Mediterranean Cooperation in Malaga by co-organising and co-sponsoring a Mediterranean/Black Sea Cetacean Red List Workshop.

The workshop was held at the Ministry of State in Monaco on 5-7 March 2006. Its stated purpose was to assess all populations of Mediterranean and Black Sea cetaceans against the 2001 IUCN Red List Categories and Criteria (Version 3.1). The IUCN Red List Authority for cetacean species and populations resides within the Cetacean Specialist Group, and therefore the CSG played a central role in the workshop's organization and conduct. Randall Reeves, CSG chairman, and Giuseppe Notarbartolo di Sciara, CSG deputy chairman, co-organised the workshop in consultation with the sponsoring bodies. Draft assessments commissioned from individual species experts were circulated to all participants prior to the workshop. These draft assessments served as the basis for workshop discussions, and the final versions reflect the consensus of participants (see Annex 3).

Randall Reeves chaired the workshop. Rapporteurs were assigned on an *ad hoc* basis. For each assessment, the rapporteur worked with the assessor(s) to revise the draft to reflect the workshop discussions and decisions. The draft assessments were subject to further editing by Reeves and Notarbartolo di Sciara after the workshop, and the entire report, including the final draft assessments, was reviewed by participants before being declared final. It was anticipated that, following publication of the workshop report, most or all of the assessments would be submitted formally for review and endorsement by the Cetacean Red List Authority (a subcommittee within the CSG) and then forwarded to the IUCN Red List Programme and the Global Mammal Assessment.

The workshop agenda is given in Annex 1; the list of participants is given in Annex 2.

Methods

All cetacean species were assessed in 1996 against the 1994 criteria (Baillie and Groombridge 1996), and some species, subspecies and geographical populations ('subpopulations') have been reassessed since then against the 2001 criteria (see Reeves et al. 2003: their Table 1.1; also http://www.redlist.org). As explained in the Guidelines for Application of IUCN Red List Criteria at Regional Levels (http://www.iucn.org/themes/ssc/redlists/regionalguidelines.htm; also see Gärdenfors et al. 2001), listing of a species at the global population level can differ from listings at the subspecies or 'subpopulation' level.

The scope of the present workshop was defined and delimited on a geographical basis, with the intent to assess the status of all cetaceans in the Mediterranean and Black Seas, some of which constitute endemic subspecies and others of which form geographically distinct 'subpopulations'. For some or many of the species considered, an uncertain amount of genetic and/or demographic interchange with populations in the North Atlantic was either known or suspected to occur. 'Units for assessment' were therefore considered on a species-by-species basis.

The decision to conduct complete assessments for 12 of these units was made on the basis of prior knowledge, as summarised by Notarbartolo di Sciara (2002). The Mediterranean subpopulation of Short-beaked Common Dolphins had already been assessed against the 2001 criteria and therefore was not reassessed (Bearzi 2003; see Annex 7). In addition to the eleven new complete assessments, available information on five 'visitor'[1] species (Common Minke Whale, Humpback Whale, Killer Whale, False Killer Whale and Rough-toothed Dolphin; see Annex 4), eight 'vagrant'[2] species (Sei Whale, North Atlantic Right Whale, Northern Bottlenose Whale, Dwarf Sperm Whale, Sowerby's Beaked Whale, Blainville's Beaked Whale, Gervais' Beaked Whale and Indo-Pacific Humpback Dolphin; see Annex 5) and one introduced species (Beluga; see Annex 6) was summarised as background for this report. Information on visitor and vagrant species is limited to occurrences within the Black and Mediterranean Seas, including the western entrance to the Strait of Gibraltar up to a line between Cape Trafalgar, Spain (36° 10' 57.34" N, 006° 02' 00.80" W), and Cape Spartel, Morocco (35° 47' 27.88" N, 005° 55' 33.06" W). Finally, a brief account is given in Annex 8 of species that have been reported in the region but for which such reports are considered invalid or doubtful.

IUCN criteria refer to reproductively mature individuals in a given population and it is therefore essential to use this measure rather than total population size. Reliable data and analyses of vital rates are generally unavailable for the populations of cetaceans in the Mediterranean and Black Seas. Therefore, the workshop made use of a draft table of "default" values prepared by Barbara L. Taylor of the Southwest Fisheries Science Center in La Jolla, California (pers. comm.). Based on her preliminary calculations and consistent with the views of workshop participants, 20 years was accepted as a sensible round number to use, at least provisionally, as the default generation time for dolphins.

[1] A taxon that does not reproduce within a region but regularly occurs within its boundaries either now or during some period of the last century (IUCN 2003).

[2] A taxon that is currently found only occasionally within the boundaries of a region (IUCN 2003).

Results

Of the 12 assessed units in the region, one was proposed to qualify for Critically Endangered, five for Endangered and two for Vulnerable. The other four were considered Data Deficient, meaning that there was inadequate information to assess their extinction risk. A brief summary of the assessment results is given in the following table.

Species / subspecies	Unit	IUCN criterion		Status		Notes	Assessor/s
				Past trend	Present trend		
Killer Whale *Orcinus orca*	Strait of Gibraltar subpopulation	**CR**	C2a(i,ii); D	?	↘	Killer Whales in the Mediterranean were not assessed and are included in the "Visitor species" section	Cañadas and de Stephanis
Sperm Whale *Physeter macrocephalus*	Mediterranean subpopulation	**EN**	C2a(ii)	↘	↘		Notarbartolo di Sciara, Frantzis, Bearzi and Reeves
Short-beaked Common Dolphin *Delphinus delphis*	Mediterranean subpopulation	**EN**	A2abc	↘	↘	Assessed in 2003	Bearzi (2003)
Common Bottlenose Dolphin *Tursiops truncatus*	Mediterranean subpopulation	**VU**	A2cde	↘	?		Bearzi and Fortuna
Striped Dolphin *Stenella coeruleoalba*	Mediterranean subpopulation	**VU**	A4de	↘	↘		Aguilar
Fin Whale *Balaenoptera physalus*	Mediterranean subpopulation	**DD**					Notarbartolo di Sciara and Panigada
Long-finned Pilot Whale *Globicephala melas*	Mediterranean subpopulation	**DD**					Cañadas
Risso's Dolphin *Grampus griseus*	Mediterranean subpopulation	**DD**					Gaspari and Natoli
Cuvier's Beaked Whale *Ziphius cavirostris*	Mediterranean subpopulation	**DD**					Cañadas
Harbour Porpoise *Phocoena phocoena relicta*	Black Sea subspecies	**EN**	A1d + A4cde	↘	↘	Interpreted to include the animals in the northern Aegean Sea	Birkun and Frantzis
Short-beaked Common Dolphin *Delphinus delphis ponticus*	Black Sea subspecies	**EN**	A1d	↘	?		Birkun
Common Bottlenose Dolphin *Tursiops truncatus ponticus*	Black Sea subspecies	**EN**	A2cde	↘	?		Birkun

↘ Suspected decline

↘ Evidence of decline

↘ Quantitative evidence of decline

? Insufficient information

Discussion

Workshop participants wished to emphasise the importance of looking beyond the categories alone when interpreting the proposed listings. The reason(s) for listing, i.e. the criterion or criteria used, must be considered in all cases. For example, as highlighted in the table above, the two dolphin populations (subspecies) in the Black Sea were assessed as Endangered primarily on the basis of past declines caused in large part by heavy exploitation (criteria A1d and A2cde). Specifically, the massive documented legal removals by deliberate exploitation in the USSR, Romania and Bulgaria until 1966 and in Turkey until 1983 caused precipitous declines in those populations within the last three generations, i.e. during the last 60 years. With the closure of the cetacean fisheries in the Black Sea countries, it was assumed that the principal cause of the reductions (or at least one of the principal causes in the case of the bottlenose dolphin) had ceased. In fact, some recovery may have taken place, although there is no clear evidence of trend for either Bottlenose Dolphins or Common Dolphins in the Black Sea. In contrast, the Black Sea Harbour Porpoise subspecies was assessed as Endangered not only because of the decline in numbers caused by legal hunting until 1983 and illegal hunting until 1991 (criterion A1d), but also because of an inferred continuing decline caused by a suite of threat factors that show no sign of moderating and may well be worsening (e.g. incidental mortality in fisheries, habitat degradation and prey depletion: criterion A4cde).

A major difference of similar kind should be noted for the Mediterranean, where the subpopulations of Bottlenose Dolphins and Striped Dolphins were both assessed as Vulnerable even though the latter is much more abundant (possibly by an order of magnitude) than the former. Bottlenose Dolphins exist in the Mediterranean region as a collection of subpopulations, the size and range of which vary considerably in different areas. This made it difficult for the workshop to agree on a proposed listing for the region as a whole. Trend data were available for only a few areas, in one of which (the northern Adriatic Sea) a decline in abundance and area of occupancy was evident. In other areas such as the Alborán Sea, surveys over the past 15 years have found no signs of a decline. It was nevertheless recognised by all participants that, as the most coastal species in the region, the Bottlenose Dolphin is likely to have been affected in numerous ways by human activities, including culling campaigns to exterminate or greatly reduce its numbers in some areas. Incidental mortality in fishing gear, prey depletion as a result of overfishing or habitat degradation, disturbance from ship traffic, and health effects caused by pollution are all suspected of having had at least local effects on Bottlenose Dolphins. Therefore, a decline of at least 30% in the Mediterranean as a whole over the last 60 years (3 generations) was suspected, based on concerns about degradation, loss and fragmentation of habitat as well as the removals due to deliberate killing (now largely stopped) and incidental mortality in fisheries (ongoing). In the case of Striped Dolphins, suspected substantial recent and ongoing mortality in pelagic driftnets (thousands of animals per year), together with the residual effects of a large-scale die-off from an epizootic in the early 1990s, provided the main basis for the proposed listing as Vulnerable. Although disease would, in some circumstances, be properly regarded as a factor in the population's natural mortality and thus not directly relevant to the decline criteria, there was reason in the case of Mediterranean Striped Dolphins to suspect that exposure to high levels of organochlorine chemicals had played a role in making the animals exceptionally susceptible to the morbillivirus infection that killed them.

Acknowledgements

Workshop participants expressed their appreciation to the ACCOBAMS Secretariat for the hard work involved in assisting with logistics and for the gracious hospitality and pleasant working venue provided. They also thanked the IUCN Centre for Mediterranean Cooperation in Malaga for supporting the concept of this workshop and facilitating its realisation, and for looking after report publication.

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Annex 1

Workshop Agenda

Mediterranean/Black Sea Cetacean Red List Workshop – Monaco, 5-7 March 2006

1. Opening of the meeting and welcome to participants
2. Adoption of the agenda
3. Review of documents
4. Introductory remarks regarding context, expectations, outcomes/products
5. Discussion on methods

6. Species:

    6.1 Species represented by populations known to regularly frequent the ACCOBAMS area:

        6.1.1 Sperm Whale, *Physeter macrocephalus*
        6.1.2 Fin Whale, *Balaenoptera physalus*
        6.1.3 Harbour Porpoise, *Phocoena phocoena*
            6.1.3.1 Black Sea
            6.1.3.2 Mediterranean Sea
        6.1.4 Bottlenose Dolphin, *Tursiops truncatus*
            6.1.4.1 Black Sea
            6.1.4.2 Mediterranean Sea
        6.1.5 Short-beaked Common Dolphin (Black Sea), *Delphinus delphis*
        6.1.6 Striped Dolphin, *Stenella coeruleoalba*
        6.1.7 Cuvier's Beaked Whale, *Ziphius cavirostris*
        6.1.8 Risso's Dolphin, *Grampus griseus*
        6.1.9 Long-finned Pilot Whale, *Globicephala melas*
        6.1.10 Killer Whale, *Orcinus orca* (Strait of Gibraltar)

    6.2 Review of species not represented by populations known to regularly frequent the ACCOBAMS area

        6.2.1 Minke Whale, *Balaenoptera acutorostrata*
        6.2.2 Humpback Whale, *Megaptera novaeangliae*
        6.2.3 Rough-toothed Dolphin, *Steno bredanensis*
        6.2.4 False Killer Whale, *Pseudorca crassidens*
        6.2.5 Killer Whale, *Orcinus orca* (Mediterranean not including Strait of Gibraltar)

    6.3 List of other species known to have occurred in the ACCOBAMS area

7. Concluding remarks
8. Closing of the meeting

Annex 2

List of Participants

Mediterranean/Black Sea Cetacean Red List Workshop – Monaco, 5-7 March 2006

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Annex 3

Regular Species

Species	Common name	Sub-region
Balaenoptera physalus	Fin whale	Mediterranean Sea
Delphinus delphis ponticus	Short-beaked common dolphin, Black Sea subspecies	Black Sea
Globicephala melas	Long-finned pilot whale	Mediterranean Sea
Grampus griseus	Risso's dolphin	Mediterranean Sea
Orcinus orca	Killer whale	Gibraltar Strait
Phocoena phocoena relicta	Harbour porpoise, Black Sea subspecies	Black Sea and Northern Aegean Sea
Physeter macrocephalus	Sperm whale	Mediterranean Sea
Stenella coeruleoalba	Striped dolphin	Mediterranean Sea
Tursiops truncatus	Common bottlenose dolphin	Mediterranean Sea
Tursiops truncatus ponticus	Common bottlenose dolphin, Black Sea subspecies	Black Sea
Ziphius cavirostris	Cuvier's beaked whale	Mediterranean Sea

Fin whale (*Balaenoptera physalus*)
Mediterranean subpopulation

Taxonomy

Family

Balaenopteridae

Relevant Common Names

EN	fin whale
FR	rorqual commun
ES	rorcual común
AR	هركول شـــائع (harcul chaii)
HR	veliki kit
EL	πτεροφάλαινα (pterofálaina)
HE	לויתן מצוי (livyatan matzui)
IT	balenottera comune
ML	baliena mbaðða
PT	baleia-comum
TR	uzun balina

Assessment Information

Data Deficient (DD)

Year Assessed

2006

Assessor(s)

Giuseppe Notarbartolo di Sciara, Simone Panigada

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

Although a great deal is known about fin whales in the Mediterranean, participants in the Monaco workshop concluded that appropriate data on trends in abundance and population-level threats were insufficient. Based on the information available, the subpopulation appears to be genetically differentiated from fin whales in the Atlantic and probably contains fewer than 10,000 mature individuals. However, in spite of the fact that some mortality is caused by vessel collisions and entanglement in fishing gear, it is impossible to judge whether the rate of human-caused mortality is high enough to cause population decline. Therefore, Data Deficient was proposed. A listing of Near Threatened was considered equally (or more) appropriate by some participants.

The following three areas of research are high priorities for improving the state of knowledge and allowing a more informed assessment of this subpopulation:

1. Fin whale surveys should be extended to the entire basin, thus covering areas such as the Tyrrhenian and Ionian Seas known to be inhabited at least seasonally by fin whales. Such surveys, however, should employ methods and designs that produce the best possible estimates of current abundance whilst also

allowing comparisons with the results of earlier surveys.

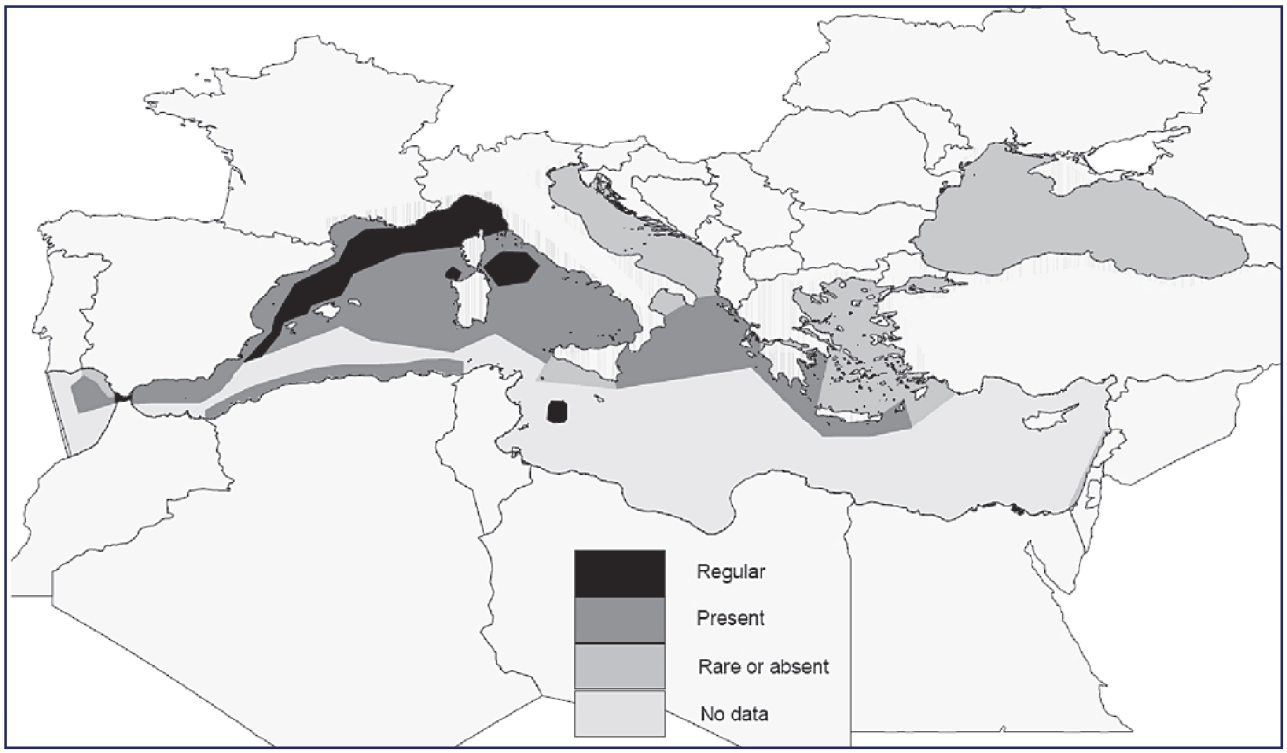
2. Genetic sampling and analyses are needed to compare fin whales in the eastern and western parts of the Mediterranean and thus to allow evaluation of the single-subpopulation hypothesis.

3. Sustained effort to document mortality from entanglement and ship strikes is needed to obtain reliable estimates of rates of human-caused removals.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania		X					
Algeria	X						
Bosnia and Herzegovina				X			
Croatia			X				
Cyprus	X						
Egypt	X						
France	X						
Gibraltar (UK)	X						
Greece	X						
Israel	X						
Italy	X						
Lebanon	X						
Libya	X						
Malta	X						
Monaco	X						
Morocco	X						
Palestinian Territory		X					
Serbia and Montenegro				X			
Slovenia			X				
Spain	X						
Syria	X						
Tunisia	X						
Turkey	X						



Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea.

Geographic Range

The fin whale is the most common large whale species in the Mediterranean Sea. It is found mostly in deep, offshore waters of the western and central portion of the region, from the waters north and east of the Balearic Islands to and including the Ionian Sea. Although present throughout the region, it is less frequent elsewhere. The Corso-Ligurian Basin and Gulf of Lion are the Mediterranean areas where fin whale abundance is highest, by far (Notarbartolo di Sciara *et al.* 2003). Fin whales are known to congregate in late February and early March in the coastal waters of the island of Lampedusa (Italy), Sicily Channel, to feed on the euphausiid *Nyctiphanes couchii* (Canese *et al.* in press)

Population

Forcada et al. (1996) estimated 3,583 fin whales (S.E. 967, 95% C.I. 2,130-6,027) in a large portion of the western Mediterranean in 1991, and Forcada *et al.* (1995) estimated 901 (S.E. 196.1, %CV 21.77, 95% C.I. 591-1,374) in the Corsican-Ligurian-Provençal basin in 1992).

Population Trend

?

Detailed Documentation

Range and Population

Genetic analyses based on both mitochondrial and nuclear DNA indicated differences between the Mediterranean population, which is thought to be resident, and fin whales in Atlantic coastal waters of

Canada, Greenland, Iceland and Spain (Bérubé *et al*. 1998). Further genetic analyses (Palsbøll *et al.* 2004) predicted that Mediterranean fin whales would prove to be largely resident in the basin, although limited but recurrent gene flow was detected in the data. Direct evidence supporting this prediction was later provided through satellite tagging (Guinet *et al.* 2005).

Fin whales are regularly encountered throughout the western and central basins, with seasonal summer concentrations in highly productive portions of the Corsican, Ligurian and Tyrrhenian seas, where they apparently feed on a single euphausiid species, *Meganyctiphanes norvegica* (Orsi Relini *et al*., 1998). Limited evidence exists of similar feeding activities in the eastern Ionian Sea (Notarbartolo di Sciara *et al.* 2003). Seasonal (late winter) feeding aggregations of fin whales have also been observed recently in the Sicily Channel (Canese *et al.* in press). Photo-identification data imply a high degree of site fidelity in fin whales summering in the Ligurian Sea (Zanardelli *et al.,* 1998). Breeding and calving grounds have yet to be identified (Notarbartolo di Sciara *et al*., 2003). Fin whales are extremely rare in the Adriatic and Aegean Seas, and in the Levant Basin.

No population estimates exist for the entire region. However, line-transect surveys yielded estimates of 3,583 fin whales (S.E. 967, 95% C.I. 2,130-6,027) over a large portion of the western Mediterranean in 1991 (Forcada *et al*., 1996), and 901 (S.E. 196.1, 95% C.I. 591-1,374) in the Corsican-Ligurian-Provençal basin in 1992 (Forcada *et al*. 1995). Further line-transect survey effort in the same area yielded a strikingly consistent density estimate of 0.015 individuals km^{-2} (Gannier, 1997).

Habitat and Ecology

Fin whales in the Mediterranean are most common in deep waters (400 to 2,500 m) but they can occur in slope and shelf waters as well, depending on the distribution of their prey (Gannier et al. 2002, Notarbartolo di Sciara et al. 2003, Panigada et al. 2005). They favour upwelling and frontal zones with high zooplankton concentrations.

Threats

Incidental mortality of fin whales in fishing gear (pelagic driftnets) is uncommon (Podestà and Magnaghi, 1989) and its effect on the population is therefore considered low but not negligible (International Whaling Commission, 1994). Ship strikes also cause mortality and are a concern particularly in areas of heavy vessel traffic (Cagnolaro and Notarbartolo di Sciara 1992, Panigada et al. 2006, Weinrich *et al.* 2006). The increasing use of high-speed ferries bears watching in this regard. Shipping noise and vessel disturbance, particularly from the unregulated whale watching that has recently begun in the area (Airoldi *et al*., 1999), is another source of concern. Contamination by organochlorines and trace elements is not as high in fin whales as in odontocetes from the same region, but the reverse is true for DDT metabolites (Fossi et al., 2003).

Conservation measures

A large international protected area (approx. 90,000 km^2), the Pelagos Sanctuary for Mediterranean Marine Mammals, was recently established and listed among SPAMIs (Barcelona Convention SPA Protocol), encompassing a key fin whale feeding area in portions of the Provençal, Corsican, Ligurian, Tyrrhenian and northern Sardinian Seas. Whale watching regulations are likely to be incorporated into national legislation in the near future. The species is listed in Appendix I of CMS, in Appendix II of the Bern Convention, in Appendix I of CITES, and in Annex 2 of the Protocol on Specially Protected Areas and the Biological Diversity in the Mediterranean of the Barcelona Convention. For the present at least, Mediterranean fin whales are protected by the International Whaling Commission's moratorium on commercial whaling that came into force in 1986.

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Short-beaked common dolphin (*Delphinus delphis ponticus*) Black Sea subspecies

Taxonomy

Family

Delphinidae Gray, 1821

Genus

Delphinus Linnaeus, 1758

Species

Delphinus delphis Linnaeus, 1758

Subspecies

Delphinus delphis ponticus Barabash-Nikiforov, 1935

Relevant Common Names

EN	[Black Sea] common dolphin, short-beaked common dolphin
BG	obiknoven delfin, karakash
RO	delfin comun
RU	[chernomorskiy] del'fin-belobochka, belobochka, obyknovennyi del'fin ([черноморский] дельфин-белобочка, белобочка, обыкновенный дельфин)
TR	tirtak
UK	[chornomors'kyi] del'fin-bilobochka, bilobochka, zvychainyi del'fin ([чорноморський] дельфін-білобочка, білобочка, звичайний дельфін)

Assessment Information

Endangered (EN A1d)

Year Assessed

2006

Assessor(s)

Alexei Birkun, Jr.

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

The Black Sea short-beaked common dolphin, *D. d. ponticus*, qualifies for listing as Endangered based on criterion A1d.

There is no estimate of overall population size. However, preliminary data for some parts of the basin suggest that it is currently at least several 10,000s, and possibly 100,000 or more.

Generation time was not estimated for this subspecies but was assumed to be approximately 20 years,

as for other long-living small cetaceans (see main text of workshop report). Three generations therefore would be about 60 years.

The past 60-year period (three generations) includes circumstances that are relevant to Criterion A, as follows:

(1) Very large directed takes occurred during the years 1946-1983 before the ban on small cetacean hunting was declared in Turkey in 1983. Within that 38-year period, the total number of common dolphins killed was at least 840,000 but certainly much greater because that value did not incorporate catch statistics from Romania (whole period), Turkey (before 1976 and after 1981) and Bulgaria (before 1958) (see "Threats").

(2) A mass stranding/mortality event caused by morbillivirus infection occurred in 1994, involving at least 100s of animals.

(3) A mass stranding/mortality event of unknown cause occurred in 1990, again involving at least 100s of dolphins.

(4) The Black Sea environment overall (including common dolphin habitat) and many of its indigenous animal populations (including common dolphin prey) have been increasingly degraded from the 1970s to the present, with a likely peak in the devastation caused by overfishing and habitat deterioration (including pollution and explosive growth of populations of invasive species) in the late 1980s–early 1990s. These processes, taken together, have led to severe declines in prey populations.

A reduction in common dolphin population size of 70% (Criterion A1d) was inferred from a simple simulation in which the population was assumed to increase at a constant 4% per year and the direct removals (as indicated in item (1) above) were incorporated. This simulation showed that a decline of more than 70% in the last three generations would be required for the current population size to be about 150,000 common dolphins.

Directed killing ceased in 1983 but degradation of habitat, prey depletion and epizootics have continued and are not well understood.

Distribution

Country Names

Range of the Black Sea common dolphin (*D. d. ponticus* Barabash-Nikiforov, 1935).
Red dot in the Kerch Strait indicates where a live stranding was recorded in August 1994.

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Bulgaria	X						
Georgia	X						
Romania	X						
Russia	X						
Turkey	X						
Ukraine	X						

Summary Documentation

Biome

Marine.

Major Habitat(s)

Open sea
Circumlittoral area over the continental shelf (usually more than 6 m but less than 200 m deep)
Shallow sea (usually less than 6 m deep; includes sea bays and straits)

Taxonomy

The subspecies *D. d. ponticus* was proposed on the basis of morphological features (Barabash 1935) that were later criticized as not being diagnostic (e.g. Kleinenberg 1956). However, comparative analyses using skull morphometrics (Amaha 1994) and nine microsatellite DNA loci (Natoli 2003 *fide* IWC 2004) suggested that differences do exist between Black Sea and Mediterranean common dolphins, even though significant differentiation was not evident from a small sample of mitochondrial DNA (Natoli 2004). It is not possible to be definitive at present, but it seems likely that gene flow between the Black and Mediterranean Seas is rare or non-existent. Therefore, the subspecies was provisionally recognized for this assessment.

Geographic Range

(a) The Black Sea area, including territorial waters and exclusive economic zones of Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine, and internal waters of Ukraine in Karkinitsky Bay; (b) internal waters of Turkey, represented by the Bosphorus Strait and Marmara Sea.

Population

The population size is unknown. There are abundance estimates for parts of the range, including the TSS; northern, northwestern and northeastern Black Sea within Russian and Ukrainian territorial waters; southeastern Black Sea within Georgian territorial waters; and central Black Sea between territorial waters of Ukraine and Turkey (see Table 1). The survey areas are small relative to the total range of the species. The results nevertheless suggest that the current total population size is at least several 10,000s, and possibly 100,000 or more.

Population Trend

↓ – until 1983 (massive directed killing reduced the population)
↓? – 1983–2006 and beyond (the population may be declining due to ongoing threats)

Detailed Documentation

Range and Population

Range: The range of common dolphins encompasses almost the entire Black Sea, including territorial waters and exclusive economic zones of Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine, and

internal waters of Ukraine in Karkinitsky Bay (Kleinenberg 1956; Geptner *et al.* 1976; Birkun 2006) and Turkey including the Bosphorus Strait and Marmara Sea (Öztürk and Öztürk 1997). Common dolphins do not occur in the Azov Sea and normally avoid the Kerch Strait, although a single live stranding was recorded there in 1994 at the time of a morbillivirus epizootic (Birkun *et al.* 1999; see distribution map). There is no reliable information from the Dardanelles Straits connecting the Marmara and Aegean Seas, nor is there any reliable evidence of movement by common dolphins through the Turkish Straits System.

Abundance: The population size is unknown. Past region-wide estimates based on strip transect surveys in the USSR (1967-1974; Zemsky and Yablokov 1974) and Turkey (1987; Çelikkale *et al.* 1989) have been shown to be fundamentally flawed for a number of methodological and analytical reasons so their use as indicators of absolute abundance is unwarranted (e.g. IWC 1992; Buckland *et al.* 1992). Nevertheless, it is generally recognized that for almost the first two-thirds of the 20th century, the abundance of common dolphins in the Black Sea was far higher than that of bottlenose dolphins, *Tursiops truncatus ponticus*, and harbour porpoises, *Phocoena phocoena relicta* (Tzalkin 1940; Kleinenberg 1956; Geptner *et al.* 1976).

Line transect surveys have been conducted recently to estimate common dolphin abundance in a few parts of the range (Table 1). The survey areas are small relative to the total range of the subspecies. Results suggest that current population size is at least several 10,000s, and possibly 100,000 or more.

Table 1 – Common dolphin abundance estimates in selected Black Sea areas

Surveyed area and observation effort	Observation platform	Research period	Uncorrected abundance estimates	References
Turkish Straits System (Bosphorus, Marmara Sea and Dardanelles)	vessel	October 1997	773 (292–2,059; 95% CI)	Dede (1999), cited after: IWC (2004)
Turkish Straits system (Bosphorus, Marmara Sea and Dardanelles)	vessel	August 1998	994 (390–2,531; 95% CI)	Dede (1999), cited after: IWC (2004)
NW, N and NE Black Sea within Ukrainian and Russian territorial waters, 31,780 km^2/2,230 km	vessel	September-October 2003	5,376 (2,898–9,972; 95% CI)	Birkun *et al.* (2004)
SE Black Sea within Georgian territorial waters, 2,320 km^2/211 km	vessel	January 2005	9,708 (5,009–18,814; 95% CI)	Birkun *et al.* (2006)
Central Black Sea beyond territorial waters of Ukraine and Turkey, 31,200km^2/660 km	vessel	September-October 2005	4,779 (1,433–15,945; 95% CI)	Krivokhizhin *et al.* (2006)

Population Trend: By the mid 1960s, the population had collapsed due to long-running overexploitation (IWC 1983; see "Threats"). However, directed takes continued until 1983 when cetacean hunting finally ceased in Turkey. The numbers of animals taken were not recorded systematically or reliably, and therefore total removals have to be estimated indirectly. It can be inferred that the number of common dolphins was much reduced by the directed kills. It is generally assumed that during the period from 1983-2005, the population was recovering. However, this may not be the case in view of mass mortality events (in 1990 and 1994) and the pronounced depletion of these dolphins' primary prey species during the same period. The population has not fully recovered, and in fact it may have recovered only very little, from the depletion caused by hunting. Further decline seems likely if degradation of the Black Sea environment worsens.

Habitat and Ecology

Common dolphins are distributed mainly offshore and visit shallow coastal waters following seasonal aggregations and regular mass migrations of their preferred prey, small pelagic fishes such as Black Sea anchovy (*Engraulis encrasicolus ponticus*) and Black Sea sprat (*Sprattus sprattus phalaericus*) (Tzalkin 1940; Kleinenberg 1956; Geptner *et al.* 1976). Annual winter concentrations of anchovies in the southeastern Black Sea and, to a lesser degree, south of Crimea create favourable conditions for wintering concentrations of dolphins. Summer concentrations of sprats in the northwestern, northeastern and central Black Sea attract common dolphins to quite different feeding grounds. These cetaceans avoid waters with low salinity, and this may explain why they never occur in the Sea of Azov and, normally, in the Kerch Strait. The mean size of common dolphin groups recorded in 2003-05 varied from 2.9 to 5.4 (Sergey Krivokhizhin, 2006, pers. comm.), and many such groups can be observed in close proximity to one other.

Threats

Last century, the population collapsed because of directed takes. The total number of animals killed is unknown, but it was estimated that before the mid 1950s common dolphins comprised 94.8% of the total number of Black Sea cetaceans killed and processed in the former Soviet Union (Tzalkin 1940; Kleinenberg 1956). Based on this value, it was calculated that during the last nine years of the cetacean fishery in the USSR and Bulgaria (1958-66), these two countries landed 440,000 common dolphins, while during the preceding 12 years (1946-57) a further 365,000 had been landed by the USSR alone (Zemsky 1996). Between 1976 and 1981, *D. d. ponticus* was believed to account for 15-16% of the Turkish catch, estimated for that period as 250,000 animals of all three species (IWC 1983).

Reduced prey availability has been considered an ongoing major threat to *D. d. ponticus* since the late 1980s (Bushuyev 2000). Of two mass mortality events that killed unknown but certainly large numbers of common dolphins in winter–spring 1990 and summer–autumn 1994 (Krivokhizhin and Birkun 1999), the latter was recognised as being the result of a morbillivirus epizootic (Birkun *et al*. 1999). However, both die-offs coincided with a drastic decline in the abundance of both principal prey species, anchovy and sprat, which has been blamed on overfishing, eutrophication (e.g. water hypoxia) and the explosive increase of the introduced ctenophore *Mnemiopsis leidyi* (Zaitsev & Mamaev, 1997). The total commercial catch of anchovies declined by 12-fold (from 468,800 tonnes in the 1987-88 fishing season to 39,100 tonnes in 1990-91), while landings of sprat fell by a factor of nearly eight (from 105,200 tonnes in 1989 to 13,800 tonnes in 1993) (Prodanov *et al.* 1997). This correlation between large die-offs of Black Sea common dolphins and prey scarcity could signify that reduced prey availability compromised the health of the dolphins and increased their susceptibility to viral infection.

Other known threats (bycatch in pelagic trawls, parasitic invasions) are of secondary importance (at least at present).

Conservation measures

The species *D. delphis* is listed globally as Least Concern by IUCN. At the same time, the Mediterranean population is listed as Endangered (see Bearzi et al. 2003), and concerns regarding the Black Sea population were expressed in the IUCN/SSC 2002-2010 Conservation Action Plan (Reeves *et al*. 2003).

Commercial killing of Black Sea common dolphins, as well as other Black Sea cetaceans, was banned in 1966 in the former USSR, Bulgaria and Romania, and in 1983 in Turkey. Black Sea states assumed certain international obligations to protect cetaceans as contracting parties to the Convention on Biological Diversity (CBD), Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention), Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). The common dolphin is included in EC Directive No.92/43/EEC on the conservation of natural habitats of wild fauna and flora; *D. delphis* is listed in its Annex IV (Animal and Plant Species of Community Interest in Need of Strict Protection). In 2003 the IWC Scientific Committee's Sub-Committee on Small Cetaceans recommended that the Black Sea population should be managed for conservation as a distinct entity (IWC 2004).

The Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (1996) envisages some special cetacean-oriented conservation and research actions. The common dolphin was included as Data Deficient in the Black Sea Red Data Book (1999). Nevertheless, it is listed as Endangered in the Provisional List of Species of Black Sea Importance, an annex to the Black Sea Biodiversity and Landscape Conservation Protocol (2002) of the Bucharest Convention. The regional Conservation Plan for Cetaceans in the Black Sea has been drafted in accordance with the ACCOBAMS International Implementation Priorities for 2002-2006 (Notarbartolo di Sciara 2002).

On a national level, Black Sea cetaceans, including common dolphins, are protected by environmental legislation and governmental decrees. Action plans for the conservation of Black Sea cetaceans were produced in Ukraine (2001) and Romania (2003) but they have no legal effect at present. The common dolphin is listed in the Red Data Book of Ukraine. In Russia and Ukraine, Red Book inscription means appropriate monitoring and management programs should be implemented at state or national levels. Such a program has existed in Ukraine since 1999.

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Long-finned pilot whale (*Globicephala melas*) Mediterranean subpopulation

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	long-finned pilot whale
FR	globicéphale noir, dauphin pilote
ES	calderón negro, calderón común, ballena piloto
AR	كروي الرأس الشائع (kouraoui arras achaii)
HR	bjelogrli dupin
EL	μαυροδέλφινο (mavrodélfino)
HE	נתב שחור (natav shachor)
IT	globicéfalo
ML	baliena sewda
PT	cachalote-anão
TR	siyah yunus

Assessment Information

Data Deficient (DD)

Year Assessed

2006

Assessor(s)

Ana Cañadas

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

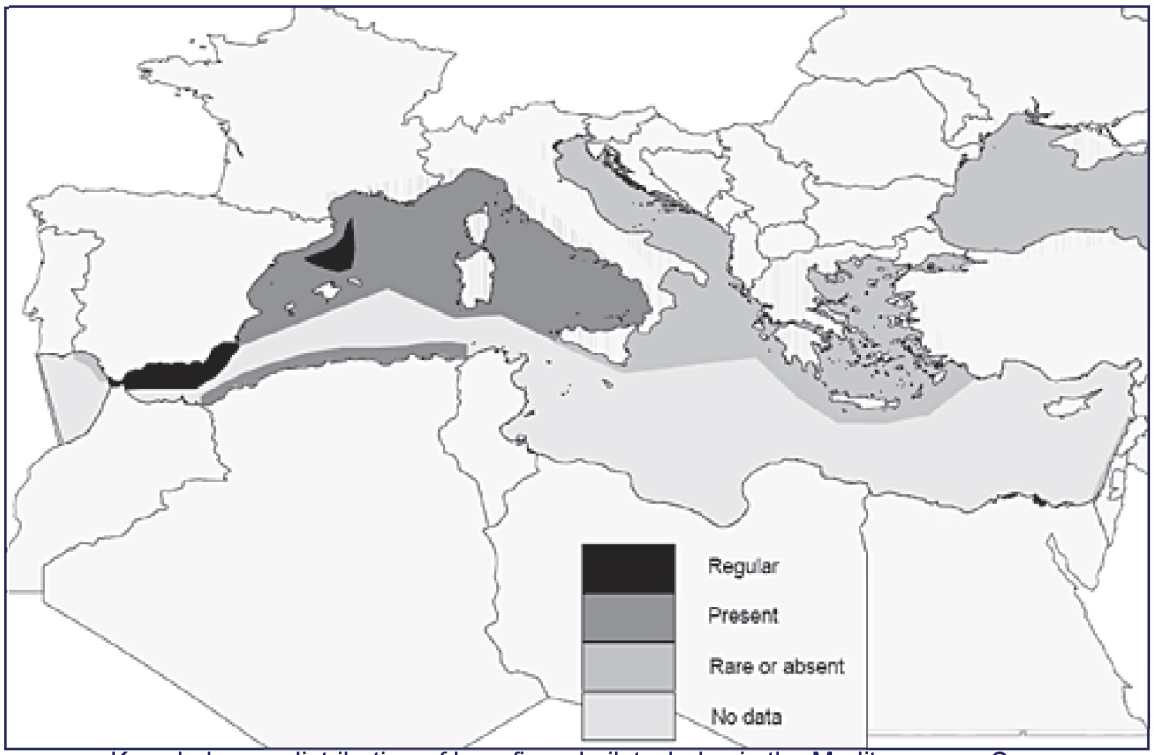
Justification

Appropriate data are unavailable on the species' biology, distribution and abundance (except in the Strait of Gibraltar) in the Mediterranean region. Therefore, it is impossible to assess, either directly or indirectly, the conservation status of long-finned pilot whales in the Mediterranean.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania						X	
Algeria	X						
Bosnia and Herzegovina						X	
Croatia						X	
Cyprus						X	
Egypt						X	
France	X						
Gibraltar (UK)	X						
Greece						X	
Israel						X	
Italy	X						
Lebanon						X	
Libya						X	
Malta				X			
Monaco	X						
Morocco	X						
Palestinian Territory						X	
Serbia and Montenegro						X	
Slovenia						X	
Spain	X						
Syria						X	
Tunisia		X					
Turkey						X	



Knowledge on distribution of long-finned pilot whales in the Mediterranean Sea.

Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea

Geographic Range

Western Mediterranean Sea including Strait of Gibraltar (see 'Range and Population' below)

Population

Estimates of abundance are available only for the Strait of Gibraltar (260-270 animals for 1999-2005, see details under 'Range and population') (Verborgh 2005; De Stephanis *et al.* 2005; Verborgh *et al.* in press). Abundance for any other area of the Mediterranean is unknown.

Population structure is unknown. The working assumption is that only a single subpopulation is present in the Mediterranean.

Very common in the Alborán Sea and adjacent waters (Cañadas and Sagarminaga 2000). Relatively common to scarce in the rest of the western Mediterranean, but not recorded in the eastern basin. Relative density unknown for most areas.

Population Trend

?

Detailed Documentation

Range and Population

There are no confirmed records of long-finned pilot whales from the eastern Mediterranean basin (Marchessaux and Duguy 1978; Frantzis *et al*. 2003) other than a floating carcase reported from the Gulf of Taranto off eastern Italy (Centro Studi Cetacei 1998), but a few unconfirmed sightings have been reported from Turkish waters (A. Oztürk pers. comm.) and other unspecified areas (3 sightings; McBrearty *et al*. 1986). The species therefore is considered to occur regularly only in the western Mediterranean Sea. No information exists about its possible former presence in the eastern basin.

Confirmed records are from: Morocco (rare except in the Straits of Gibraltar; Bayed 1996; Verborgh 2005; de Stephanis *et al.* 2005; Verborgh *et al.* in press), Algeria (scarce; Boutiba 1994), Tunis (rare; Lotfi *et al*. 1997), Spain (abundant in the Alborán Sea and Gulf of Vera but scarce northwards; Raga and Pantoja 2004; Cañadas *et al*. 2005), France (scarce; UNEP-RAC/SPA 1998; Gannier 2005) and Italy (regular to scarce; e.g. Podestá *et al*. 1997).

Estimates of abundance are available only for the Strait of Gibraltar, where mark-recapture analysis on well-marked animals gives estimates ranging from 249 to 270 animals (Verborgh 2005; Verborgh *et al.* in press; De Stephanis *et al.* 2005). In the Alborán Sea numbers are possibly several hundred to a few thousand (maximum number seen together was 350; Cañadas and Sagarminaga 2000) but no estimate has been attempted yet from the available sightings data. Encounter rates are much higher in the Alborán Sea than in any other part of the Mediterranean (Cañadas and Sagarminaga 2000). Pilot whales are increasingly scarce in Spanish waters northwards from the Gulf of Vera, comprising only 2.1% - 2.5% of cetacean sightings recorded there (Raga and Pantoja 2004). The percentages are also low in other areas of the Mediterranean – e.g. 0.9 % for the Central Mediterranean, 2% for the NW Mediterranean, 3.6% for North African waters and 7.9% south of the Balearic Islands, as compared to 18.3% for the Alborán Sea (Cañadas and Sagarminaga 2000).

Strandings have been recorded in Algeria, Italy, France and Spain (Boutiba 1994; Podestá *et al*. 1997;

UNEP-RAC/SPA 1998; Raga and Pantoja 2004). One animal (a floating carcass) was found in Greece (Frantzis *et al*. 2003).

No genetic or other types of molecular analyses of relationships between Mediterranean and Atlantic long-finned pilot whales have been reported. Therefore, nothing is known about possible gene flow through the Strait of Gibraltar. The only relevant observation is that most long-finned pilot whales are "resident" in the Strait of Gibraltar according to a photo-identification study (Verborgh 2005; Verborgh *et al.* in press; De Stephanis *et al.* 2005), although some individuals that have been seen only once in the last 7 years are considered "transient" (Verborgh 2005; Verborgh *et al.* in press; De Stephanis *et al.* 2005).

Habitat and Ecology

The long-finned pilot whale is a predominantly offshore species with a preference for deep waters seaward of the continental shelf and slope in all areas of occurrence in the Mediterranean (Gannier 1995; Raga and Pantoja 2004; Cañadas *et al*. 2005). Preferred habitats are generally deeper than 500 m (mean of 849m, SD=281, range 207-1800m) with intermediate slopes in the Alborán Sea (Cañadas *et al*. 2002; Cañadas *et al.* 2005). They are even deeper in the central and NW Mediterranean: range 2000-2500m in the Ligurian Sea (S. Airoldi, pers. comm.), mean of 2063m (SD=875, range=750-2500) in the Ligurian and Tyrrhenian Seas (Notarbartolo di Sciara *et al*. 1993) and mean of 2056m (SD=403) in the Provençal-Ligurian area (Gannier 2005).

The species is regarded as predominantly a squid-eater, but whales also feed at least occasionally on pelagic fish (Relini and Garibaldi 1992; Cañadas *et al*. 2002 and references therein; Olson and Reilly 2002).

Long-finned pilot whales are highly social, with a social structure similar to that of killer whales (Olson and Reilly 2002). Average group sizes in the Alborán Sea (30.3, SE=2.19; Cañadas *et al*. 2005) and the Ligurian Sea (30.6, SE=4.34, S. Airoldi, pers. comm.) are much larger than in other surveyed parts of the Mediterranean: 12 for the Tyrrhenian Sea (Di Natale 1982), 10.0 for the central and NW Mediterranean (SE=1.33; Notarbartolo di Sciara *et al*. 1993) and 11 for the east coast of Spain (Raga and Pantoja 2004). Opportunistic sightings gave the highest average group size for the Alborán Sea in summer (23.4) compared to the rest of the Mediterranean and the NE Atlantic (9.5) (McBrearty et al. 1986).

Threats

Owing to their occurrence in offshore waters and their feeding habits targeting mainly deep-sea squid, long-finned pilot whales are probably not often exposed to human activities that occur in coastal waters (tourism, many types of fisheries, etc.). No serious threats have been identified in the Mediterranean as yet. However, potential threats include by-catch (between 1978 and 1982, 26 pilot whales were reported caught in fishing and other gear in the western Mediterranean, at least 3 of them in tuna nets; Northridge 1984); collisions with ships (at least two in the Straits of Gibraltar – R. de Stephanis, pers. comm.; two in the Tyrrhenian Sea – Di Natale 1982; one in the NW Mediterranean – Pesante *et al.* 2002); man-made noise (interaction but no clear results reported in the Ligurian Sea; Rendell and Gordon 1999); harassment during whale watching; and toxic pollution (high levels of organochlorine contaminants such as DDT and PCB in the Atlantic – Olson and Reilly 2002; high levels of cadmium in the Faeroe Islands – Caurant *et al*. 1993; Olson and Reilly 2002).

Conservation measures

One of the areas with regular confirmed presence of long-finned pilot whales in the Mediterranean, the western section of the Ligurian Sea, is included within the marine Sanctuary dedicated to cetaceans in the Corso-Ligurian Basin, created by the Governments of Italy, France and Monaco (Pelagos Sanctuary, SPAMI). No management or conservation measures have been taken as yet specifically for the conservation of this species.

A SPAMI (Specially Protected Area of Mediterranean Importance) under the Barcelona Convention has been proposed for the northern half of the Alborán Sea and Gulf of Vera in southern Spain (Cañadas *et al*. 2005), but it has not yet been designated or even evaluated by the Spanish administration. This proposed area includes the "hot-spots" for long-finned pilot whales in the Mediterranean.

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Risso's dolphin *(Grampus griseus)*
Mediterranean subpopulation

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	Risso's dolphin
FR	dauphin de Risso
ES	calderón gris, delfín de Risso
AR	غرامبوس (ghrambous)
HR	glavati dupin
EL	σταχτοδέλφινο (stachtodélfino)
HE	גרמפוס (grampus)
IT	grampo
ML	delfin griú
PT	grampo
TR	grampus

Assessment Information

Data Deficient (DD)

Year Assessed

2006

Assessor(s)

Stefania Gaspari and Ada Natoli

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

Risso's dolphin is widely distributed in temperate and tropical waters worldwide but little is known about the species. Estimates of abundance are available for only a few regions and details of distribution are generally lacking. This is also true of Risso's dolphins in the Mediterranean Sea. No large-scale surveys have been conducted to assess their range, distribution or numbers although their presence has been established from small-scale surveys in particular areas (specified in later sections). The proposed listing is Data Deficient.

Long-term studies in the Ligurian-Corso-Provençal basin indicate that:
1- Risso's dolphins in the Mediterranean are genetically differentiated from those in the eastern Atlantic (Gaspari *et* al 2006).
2- Genetic characteristics of animals sampled in the Ligurian-Corso-Provençal basin were variable but suggestive of intra-basin structuring (Gaspari *et al* 2006).
3- In the Ligurian-Corso-Provençal basin, a core group of individuals is present during the summer and this group shows a degree of site fidelity (Airoldi *et al* 2005). However, additional Risso's dolphins probably visit the area.

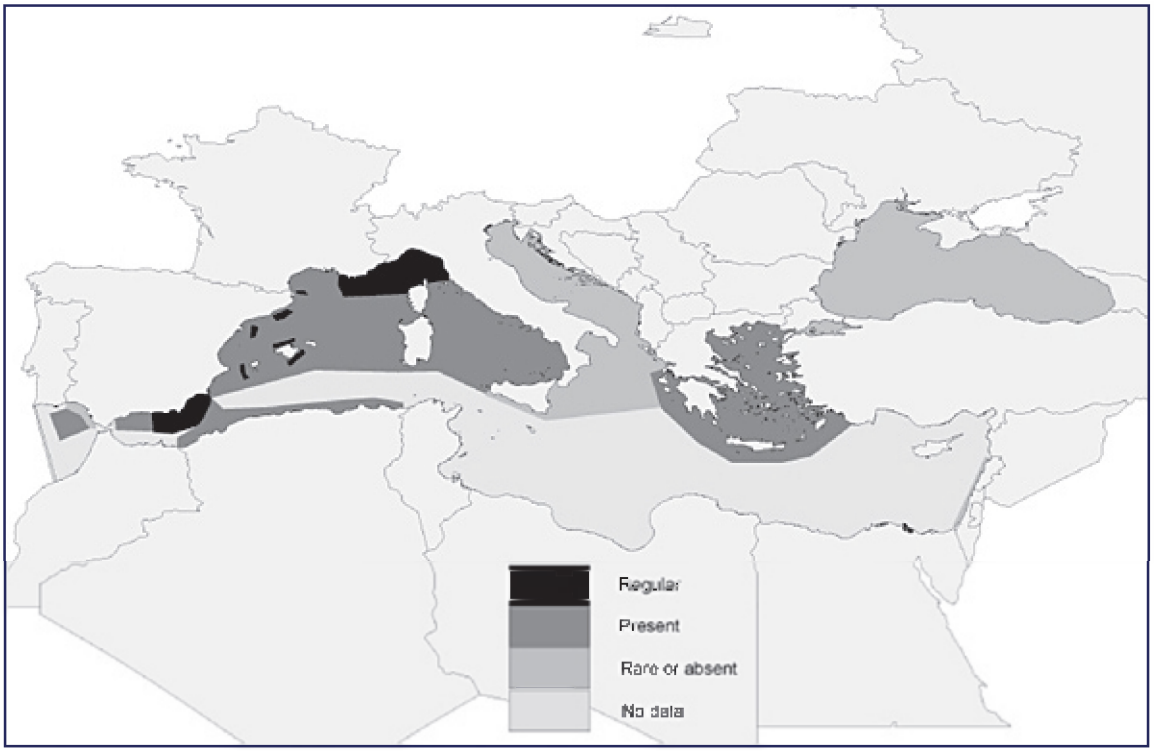
4- Preferred habitat is continental slope waters with steep relief.
5- Risso's dolphins are taken as a bycatch in gillnets and on longlines.

The following types of data are needed to support an assessment of the subpopulation:
1- Distribution and abundance, preferably in relation to habitat features and population substructure.
2- Genetic population structure, which requires more extensive sampling to cover a larger proportion of the species' range within the Mediterranean.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania		X					
Algeria	X						
Bosnia and Herzegovina				X			
Croatia			X				
Cyprus		X					
Egypt		X					
France	X						
Gibraltar (UK)		X					
Greece	X						
Israel	X						
Italy	X						
Lebanon		X					
Libya		X					
Malta							
Monaco	X						
Morocco	X	X					
Palestinian Territory		X					
Serbia and Montenegro				X			
Slovenia			X				
Spain	X						
Syria		X					
Tunisia		X					
Turkey		X					



Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea

Geographic Range

Risso's dolphins are found in much of the Mediterranean Sea although most reported sightings have been in the western basin. These dolphins appear to be scarce in the eastern Mediterranean although this may be at least partly due the relative lack of survey effort there.

Population

Although Risso's dolphins are regularly sighted in the western Mediterranean, no population estimates exist for the species in this region. They are generally considered scarce.

Population Trend

?

Detailed Documentation

Range and Population

Range and Distribution

Risso's dolphins occur in much of the Mediterranean Sea although most reported sightings have been in the western basin. The greatest concentration is in the Ligurian-Corso-Provençal basin, where the species is present all year-round. In general, Risso's dolphins prefer deep offshore waters and continental slope areas. The Ligurian-Corso-Provençal basin is one of the few areas in the Mediterranean Sea where the continental shelf is close to the coast, giving especially good opportunities to observe and study this species. Risso's dolphins also occur seasonally in the southern Tyrrhenian Sea off the west coast of Ischia and between the island of Ustica and the Aeolian islands. They are observed regularly in the Balearic Sea

and in the eastern half of the Alborán Sea (mainly from Seco de los Olivos to the Gulf of Vera) all year-round.

The apparent scarcity of Risso's dolphins in the eastern Mediterranean may be partly due to the paucity of observational effort there. A few sightings and strandings have been recorded along the coast of Israel and in the Aegean Sea. Risso's dolphins have been observed in the eastern Ionian Sea (Greece), around the western side of Crete and in the western Ionian Sea (Sicily). A few strandings have also been recorded in the northern Adriatic Sea.

No data are available for the southern Mediterranean Sea.

Population identity and structure
Risso's dolphins in the Mediterranean Sea are genetically differentiated from those in the eastern Atlantic. This implies that gene flow between the two areas is limited or negligible and that the Mediterranean animals constitute a distinct population (Gaspari et al 2006). There is also some evidence of structuring within the Mediterranean. Most of the samples analysed were from the Ligurian Sea, so it is possible that multiple populations use this area as a foraging ground (Gaspari *et al* 2006).

Abundance and Trend
Line-transect abundance estimates exist only for the western central Mediterranean, where aerial surveys from 2001-03 resulted in an estimate of 493 Risso's dolphins (95% C.I. 162-1,498) in an area of 32,270 km2 (Gómez de Segura *et al* in press).

In all surveyed areas, encounter rates have been low (i.e.: Ligurian-Corso-Provençal basin, 0.098 per km – Tethys Research Institute; southern Tyrrhenian Sea, 0.2 per nmi – B. Mussi, pers. comm.; Alborán Sea, 0.0032 per km - Cañadas *et al* 2005).

There is no baseline information on abundance and therefore it is not possible to assess trends for the Mediterranean population.

Habitat and Ecology

Habitat preferences
Risso's dolphins show a preference for deep pelagic waters, in particular over steep shelf slopes and submarine canyons (Azzellino *et al* 2006; Cañadas *et al* 2002).

Individual Associations and Kinship
Risso's dolphins in the Ligurian Sea (1990-2000) were encountered in groups of variable size, with mostly weak inter-individual associations but also some consistent relationships between individuals over periods of months and, in a few cases, years (Gaspari, 2004). Limited evidence on genetic similarity among individuals within and among groups (n = 30) in the northwestern Mediterranean suggests that Risso's dolphins have a fluid social structure (Gaspari, 2004).

Threats

Bycatch
In the Mediterranean Sea, Risso's dolphins are among the cetacean species frequently found entangled in fishing nets. Bycatches in longlines and gillnets have been reported in Spain (Valeiras *et al* 2001) and Italy (Notarbartolo di Sciara, 1990).

Noise
Sound pollution is a threat to deep-diving pelagic cetaceans, including Risso's dolphins. Although there are no records of Risso's dolphin strandings in the Mediterranean Sea directly attributable to noise, evidence consistent with a syndrome related to exposure to high-intensity sonar has been described in this species in the UK (Jepson et al 2005).

Contaminants
Like other odontocetes, Risso's dolphins in the Mediterranean carry substantial contaminant burdens (Kim *et al* 1996, Marsili & Focardi 1997, Shoham-Frider *et al* 2002, Fossi & Marsili 2003).

Conservation measures

To date, no specific conservation measures have been taken for Risso's dolphins in the Mediterranean Sea. The existence of a Marine Sanctuary for cetaceans in the Corso-Ligurian Basin, declared by the Governments of Italy, France and Monaco, has proved to be of great value for the study of Risso's dolphins. Most of the detailed studies of Risso's dolphins within the Mediterranean have taken place there. Research on Risso's dolphin within the Pelagos Sanctuary should be expanded, and additional areas in the region should be identified where protective measures would benefit the species. The first step toward this has taken place in southern Spanish waters, where habitat preference modelling has been undertaken to define *Areas of Special Interest for the Conservation of Cetaceans in the Spanish Mediterranean* (Cañadas *et al* 2005).

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Killer whale, or Orca (*Orcinus orca*)
Strait of Gibraltar subpopulation

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	killer whale, orca
FR	orque, épaulard
ES	orca, esparte
AR	أركة (arqa)
HR	orka, kit ubojica
EL	όρκα (orka)
HE	קטלן (katlan)
IT	orca
ML	orka
PT	orca
TR	katil balina

Assessment Information

Critically endangered (CR C2a(i,ii); D)

Year Assessed

2006

Assessor(s)

Ana Cañadas and Renaud de Stephanis

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

Every year the same population of whales, consisting of three cohesive pods, is present in the Strait of Gibraltar and there is no evidence that these whales move out of the strait or mix with any other groups of killer whales.

A total of 32 individuals has been photo-identified from regular observation since 1999 (de Stephanis et al. 2002, 2005a, 2005b). It is possible that a few more individuals are present in the population and have not been photo-identified, but it is very unlikely that the total number of animals using the area is greater than 50.

Several animals from the population were reportedly killed in Morocco in recent years (2 in July 2004, 6 in September 2005) although the reports are unconfirmed. Fewer live animals were observed in 2005 than in previous years since 1999, but the number of tuna (their main prey; de Stephanis 2005; de Stephanis et al 2005a; Guinet et al. in prep.) in the strait was also exceptionally low in 2005 so this could help explain the lower numbers of whales observed. The first surveys carried out in 2006 (up to May) have shown no presence of killer whales in the area, in months when they are usually seen. However, the presence of

tuna in the area this year is for the moment even lower than in 2005.

The subpopulation qualifies for Critically Endangered based on criteria C2a(i,ii) and D.

C2a(i,ii): There are far fewer than 250 mature individuals and a continuing decline in the number of mature individuals is projected based on the recent reports (albeit unverified) of direct killing by Moroccan fishermen and the growing resentment evoked by the whales' depredation on tuna longlines. Both subcriteria a(i) and a(ii) apply as all mature individuals, of which there are fewer than 50, belong to the same population.

D: There are fewer than 50 mature individuals in the subpopulation.

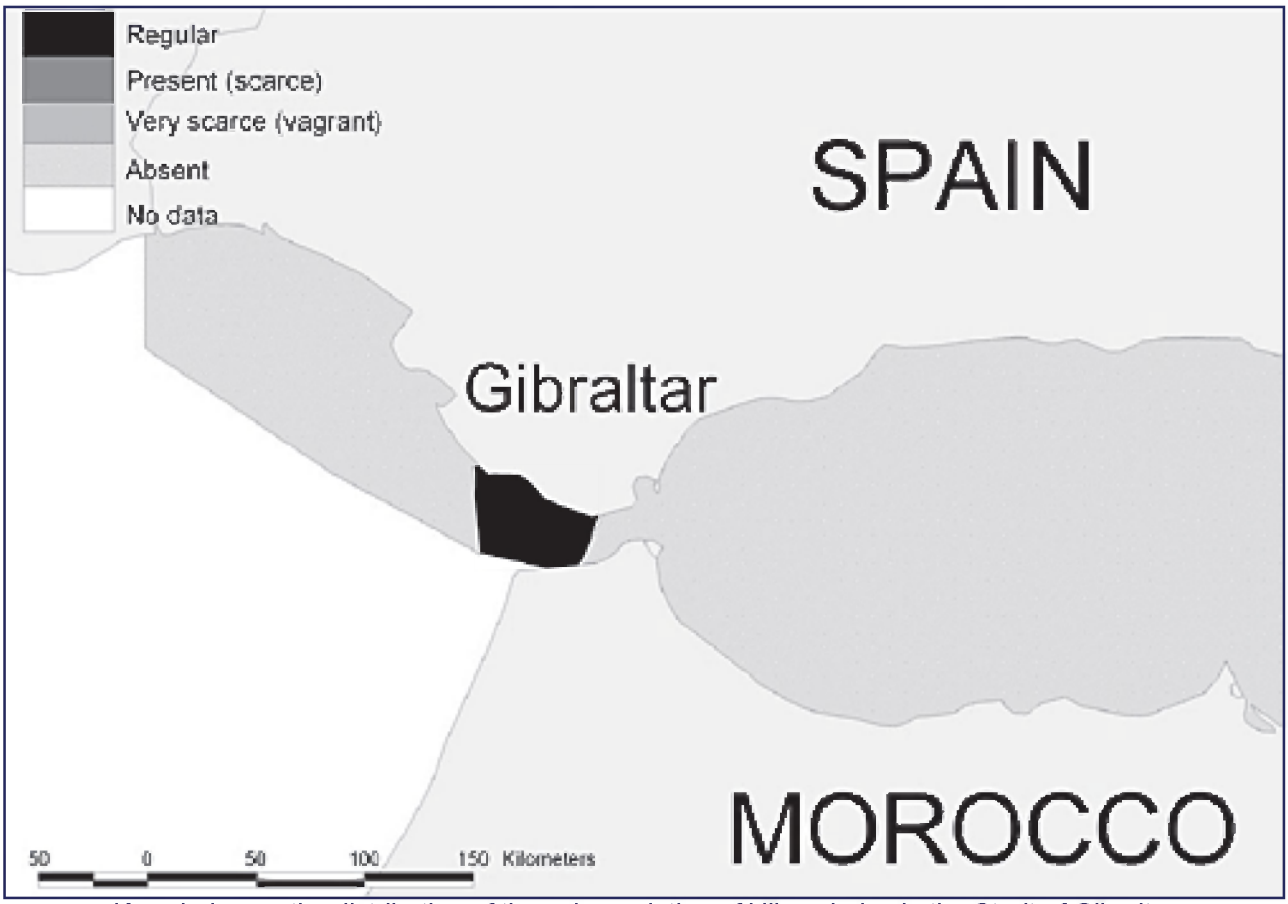
Identification of this group of whales as a designatable unit (subpopulation) is problematic and therefore research is needed to clarify its relationship to other groups of killer whales in the North Atlantic. Priority research tasks include:

1. Compiling and verifying any information on removals (direct or incidental).
2. Conducting genetic analyses with samples from biopsies in the Strait of Gibraltar, the museum specimen in Monaco, other NE Atlantic killer whales (e.g. Canary Islands) etc.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania							
Algeria							
Bosnia and Herzegovina							
Croatia							
Cyprus							
Egypt							
France							
Gibraltar (UK)							
Greece							
Israel							
Italy							
Lebanon							
Libya							
Malta							
Monaco							
Morocco	X						
Palestinian Territory							
Serbia and Montenegro							
Slovenia							
Spain	X						
Syria							
Tunisia							
Turkey							



Knowledge on the distribution of the subpopulation of killer whales in the Strait of Gibraltar (adapted from de Stephanis *et al*. 2005b).

Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea (suitable)
Shallow (moderately suitable)

Taxonomy

Taxonomy of the genus *Orcinus* is in flux but there is considerable support for recognizing multiple species and subspecies in the global context (Reeves *et al*. 2004). How the whales in the Strait of Gibraltar fit into any particular classification scheme is unclear.

Geographic Range

Regular in the Strait of Gibraltar and adjacent Atlantic waters.

Population

The size of the subpopulation has been estimated at about 32 animals, which is the number that has been photo-identified to date (de Stephanis et al. 2002, 2005a, 2005b). They occur in three social groups, called pods.

Population Trend

Probably declining due to reported kills in Morocco. Fewer photo-identified individuals observed in 2005

than in previous years. Declining availability of bluefin tuna caused by overfishing may be a contributing factor.

Detailed Documentation

Range and Population

Killer whales are regular and "resident" in the Strait of Gibraltar and contiguous Atlantic waters (de Stephanis et al. 2002, 2005a, 2005b). They are only sporadically present in the western Mediterranean (Gibraltar, Spain, Morocco, France, Italy, Malta) (Casinos 1981; Raga et al. 1985; Notarbartolo di Sciara 1987, 2002; Hammond and Lockyer 1988), although there is no evidence that they belong to the Strait of Gibraltar population. Only 32 individuals have been photo-identified in the Strait of Gibraltar subpopulation, of which 82% are mature. There are three social groups, or pods. When study of this population began in 1999, 2 calves were present. Since then only two more neonates have been observed (de Stephanis et al. 2005b).

The same animals have been identified in the Strait of Gibraltar between 1999 and 2005. They are consistently seen from March to October (research season), although they have also been seen during the winter months whenever a few surveys have been conducted. No connections with other populations or observations of identified individuals in other regions are known. Given the small size of this population, its high degree of residency, and the lack of observations of other 'transient' animals, the Gibraltar population is treated here as a geographical subpopulation. However, the possibility of gene flow and demographic interchange with other N Atlantic groups of killer whales cannot be ruled out.

Habitat and Ecology

This population lives in shallow waters of the Strait of Gibraltar (20-300 m) (de Stephanis 2005; de Stephanis *et al*. 2005b). The whales feed primarily on bluefin tuna (*Thunnus thynnus*) between February and November. Their diet in other months is completely unknown. Stable isotopes analyses, now underway, should help clarify year-round diet.

Threats

a) *Prey depletion*: Killer whales in the Strait of Gibraltar feed mainly on bluefin tuna. Two main fisheries operate in the area (and with which killer whales have strong direct interaction): the maze nets in the coasts of the Gulf of Cadiz and the northern coast of Morocco and longlines southwest of Tarifa in the Straits. Catches peaked at 39,000 tonnes in 1994 in the Mediterranean, but by 2002 had declined by nearly 50% to 22,000 tonnes (FAO 2005a; FAO 2005b). Currently bluefin tuna make up only around 3% of all catches in the Mediterranean (by weight); still, their economic importance remains high due to strong overseas demand for sushi and sashimi (FAO 2005a). Almost all of the tuna captured by the Spanish fleets is sold to Japan. In 2005, fishermen reported that the number of tuna in the area was extremely low. The number of killer whales was lower than previous years too (R. de Stephanis, pers. comm.). As bluefin tuna become more depleted, it is uncertain whether the killer whales specialised to feed on them in this area will be able to adapt by changing their foraging strategy or location.

b) *Culling by fishermen*: Spanish and Moroccan fishermen are annoyed by the intense interaction of killer whales with the bluefin tuna fishery – the whales steal about 17% of the catches (in number of fish) (de Stephanis *et al*. 2005a). In retaliation, two killer whales reportedly were killed in Morocco in July 2004 and 6 more in September 2005 (F. Thomere, pers. comm.), although this has not yet been confirmed. Those removals would represent 25% of the known population. If culling at this rate were to continue, the population would be exterminated within a very short time.

c) *Construction of wind farms*: Three large wind farms, each with more than 100 wind generators, are planned for construction in the habitat of the killer whales. The effects that these structures will have on the killer whale population, or the bluefin tuna migration, are unknown, but they are unlikely to be positive, mostly in the construction phase.

No analyses have been conducted on toxic pollutants in the animals of this population. Acoustic pollution is extremely intense in this area due to the heavy maritime traffic. A large whale-watching industry has developed in the Strait of Gibraltar. Because the whale-watching operators go to the feeding areas where

the whales are interacting with the bluefin tuna fishing, the fishermen complain that the presence of the whale-watching boats makes their work more difficult and this has the effect of increasing their animosity towards the killer whales. The small size of the population and its low rate of recruitment make it extremely vulnerable to anthropogenic activities and stochastic events.

Conservation measures

The Natural Park of the Strait of Gibraltar (SAC) does not apply to this species. There is a proposal of an SAC in the area (extension of the existing SAC) that would cover part of the range area of killer whales (Cañadas *et al*. 2005). In Morocco, no conservation measures are applied.

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Harbour porpoise (*Phocoena phocoena relicta*)
Black Sea subspecies

Taxonomy

Family

Phocoenidae Gray, 1825

Genus

Phocoena G. Cuvier, 1817

Species

Phocoena phocoena (Linnaeus, 1758)

Subspecies

Phocoena phocoena relicta Abel, 1905

Relevant Common Names

EN	[Black Sea] harbour porpoise
BG	morska svinya, mutkur
KA	azovka, zgvis gori
EL	φώκαινα (fókaina)
RO	marsuin, focena, porc de mare
RU	[chernomorskaya obyknovennaya] morskaya svinya, azovka ([черноморская] обыкновенная морская свинья, морская свинья, азовка)
TR	mutur
UK	[chornomors'ka zvychaina] mors'ka svynya, azovka, pykhtun ([чорноморська] звичайна морська свиня, азовка, пихтун)

Assessment Information

Endangered (EN A1d+4c,d,e)

Year Assessed

2006

Assessor(s)

Alexei Birkun, Jr. and Alexandros Frantzis

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

The Black Sea harbour porpoise, *P. p. relicta*, qualifies for listing as Endangered (EN) based on criteria A1d and A4c,d,e. The basis for inferences and suspicions leading to that assessment is summarised below.

The estimated generation time is around 9-10 years (see main text of workshop report), thus three generations for the Black Sea harbour porpoises would be 27-30 years.

There are no estimates of unexploited or present total population size, although the available information suggests that present abundance is at least several thousands.

The following information from the last three decades is relevant to the proposed classification. However, it is important to note that very high levels of direct and incidental mortality occurred for a long period before then (from the 1830s and throughout the 20th century) and this undoubtedly would have dramatically reduced the population prior to the 1970s (IWC, 2004).

(1) Large directed takes occurred during the years 1976-1983 before the ban on small cetacean hunting was declared in Turkey in 1983. Within that period, the total number of harbour porpoises killed was at least 163,000-211,000. Illegal direct killing of unknown numbers continued in some parts of the Black Sea until 1991.

(2) Regionally extensive incidental mortality of porpoises in bottom-set gillnets is roughly estimated to have been in the thousands annually through the 1980s. The scale of this mortality almost certainly increased in the 1990s-2000s owing to the rapid expansion of illegal, unreported and unregulated fishing in the Black Sea.

(3) A major mass stranding/mortality event occurred in the Azov Sea in August 1982 as a result of an explosion at a gas-extraction platform. More than 2,000 porpoises were found on shore following this event.

(4) Two other mass stranding/mortality events occurred in 1989 and 1990, attributed to the combined effects of parasitic and bacterial infections. Although difficult to quantify, the mortality of porpoises is believed to have been in the thousands.

(5) Periodically (most recently in November 1993), natural mass mortality events occur as a result of ice entrapment in the Azov Sea. Although no direct estimates are available, these can result in the deaths of several tens or more animals.

(6) There has been general and ongoing degradation of the Black Sea environment (including harbour porpoise habitat) and biodiversity during the 1970s-2000s, with perhaps the most serious period in the late 1980s–early 1990s due to a combination of overfishing, water pollution, eutrophication, demersal fish die-offs caused by hypoxia and the population explosion of harmful alien species. This degradation almost certainly has resulted in a decline in the abundance and quality of harbour porpoise prey.

(7) The harbour porpoise was considered extinct in the Mediterranean Sea until 1997, when a specimen stranded alive in the northern Aegean Sea; a few further strandings and sightings have occurred in that limited area since then.

EN: A1d. A reduction in population size of 70% over the past 30 years is inferred based on paragraphs (1) and (3) above, i.e. the directed takes and, to a lesser degree, the accident in 1992 (considered 'actual exploitation' in the context of IUCN criteria). These causes were clearly reversible and understood and they have ceased. Despite the absence of abundance estimates for the initial part of the 30-year period, the suspected decline of 70% is based on inferences from a crude extrapolation based on the annual removal levels in the Turkish fishery: a reduction of 70% implies that the population in 1976 must have been at least 233,000-302,000, whereas a reduction of 50% (threshold for Vulnerable) would require a population size of at least 326,000-422,000. The latter seems unrealistic given the duration and intensity of past exploitation.

EN: A4c,d,e. A reduction in population size of >50% over a 30-year period that includes both the past and the future is inferred based on the above paragraphs except (1) and (3). During this period, although direct killing has ceased, the other known or suspected causes of decline (bycatch, habitat degradation, prey depletion, epizootics and adverse climatic circumstances) have not ceased.

Distribution

Range of the Black Sea harbour porpoise, *P. p. relicta* Abel, 1905 (inset the North Aegean Sea). Note that there is no confirmed information from the Dardanelles Straits. There are rare reports from some coastal lagoons and estuaries.

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Bulgaria	X						
Georgia	X						
Greece	X*						
Romania	X						
Russia	X						
Turkey	X						
Ukraine	X						

* Possible separate subpopulation in the Aegean Sea.

Summary Documentation

Biome

Marine. On rare occasions Black Sea harbour porpoises occur in estuarine and fluvial environments.

Major Habitat(s)

Circumlittoral area over the continental shelf (usually more than 6 m but less than 200 m deep).
Open sea.
Shallow sea (usually less than 6 m deep; includes sea bays and straits).

Isolated instances are known of Black Sea harbour porpoises visiting estuaries of big rivers including their deltas, big rivers proper and their confluents, coastal brackish and saline lagoons, and freshwater lakes connected with the sea by rivers.

Taxonomy

The Black Sea harbour porpoise is recognized as a subspecies (*P. p. relicta*) with morphological (Tzalkin 1938) and genetic differences from *P. phocoena* populations elsewhere in the world (Rosel *et al*. 1995, 2003). Black Sea and Aegean harbour porpoises have identical mtDNA sequences in the hypervariable control region (Rosel *et al*. 2003) but it is possible that they represent separate subpopulations of the

subspecies.

Geographic Range

(a) The entire Black Sea area, including territorial waters and exclusive economic zones of Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine; (b) internal waters of Ukraine in the Black Sea, including the Dnieper-and-Boug Liman (firth) and Karkinitsky Bay; (c) internal waters of Russia and Ukraine, represented by the Kerch Strait and Azov Sea; (d) internal waters of Turkey, including the Bosphorus Strait, Marmara Sea and, possibly, Dardanelles Straits; (e) Greek and, probably, Turkish territorial waters in the northern Aegean Sea; and (f) lagoons, estuaries, rivers and lakes located mainly on the northwestern coast of the Black Sea and round the Azov Sea in Ukraine and Russia.

Population

The total population size is unknown. However, there are recent abundance estimates for parts of the range, including the Azov Sea, Kerch Strait, and Russian and Ukrainian territorial waters in the Black Sea (see Table 1). These estimates suggest that population size is at least several thousands or possibly even the low tens of thousands. Population structure within the Black Sea is likely, with three or more subpopulations including ones that spend the warm period of the year in geographically and ecologically different areas, *e.g.* Azov Sea, northwestern Black Sea, Sea of Marmara or Turkish Straits System (TSS) as a whole (including Sea of Marmara, Bosphorus and, possibly, the Dardanelles). Another subpopulation (most likely the smallest) is thought to be resident in the northern Aegean Sea of the Mediterranean.

Population Trend

↓ – until 1983 (massive directed killing reduced the population)
↓? – 1983–2006 and beyond (the population presumably is still declining as incidental mortality and habitat degradation worsen)

Detailed Documentation

Range and Population

Range: The subspecies' range includes the Black Sea proper, Azov Sea, Kerch Strait (*e.g.*, Tzalkin 1938), Marmara Sea, Bosphorus Strait (Öztürk and Öztürk, 1997), northern Aegean Sea (Frantzis *et al*. 2001) and also, very likely, the Dardanelles Straits (Harun Guclusoy, 2006, pers. comm. to Frantzis) connecting the Marmara and northern Aegean Seas. The Black Sea population is completely isolated from the nearest *P. phocoena* population in the northeastern Atlantic by a wide range hiatus in the Mediterranean Sea (Frantzis *et al*. 2001). Although there is no agreement on when it happened (Kleinenberg 1956; Frantzis *et al*. 2001), it is clear that the species came to the Black Sea via the Mediterranean which, therefore, must have had its own harbour porpoise population in the past.

The range of the Black Sea subspecies includes territorial waters and exclusive economic zones of Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine in the Black Sea; internal waters of Ukraine in the Black Sea (including the Dnieper-and-Boug Liman and Karkinitsky Bay); internal waters of Russia and Ukraine in the Azov Sea and Kerch Strait; internal waters of Turkey (TSS, including the Bosphorus Strait, Marmara Sea and, possibly, the Dardanelles); Greek territorial waters in the northern Aegean Sea (Thracian Sea, Kavala Gulf, Strymonikos Gulf, Agiou Orous Gulf, and Thermaikos Gulf); and possibly Turkish territorial waters of the northeastern Aegean Sea, at the exit of the Dardanelles Straits. Occasionally, harbour porpoises have been sighted in the Danube, Dnieper, Don and Kuban rivers, their estuaries, deltas and tributaries (*e.g.*, in the Danube in 1984-1989 and 2003 or in the Ingulets, a confluent of the Dnieper, in 1999), and coastal freshwater, brackish and saline lakes and lagoons including the Yalpug and Sivash lakes, Berezansky and Grigorievsky lagoons, Tendrovsky, Yagorlytsky and Jarylgachsky bays, and the Gulf of Taganrog (Tzalkin 1940a; Geptner *et al*. 1976; Birkun 2006). All of these sites are situated in Ukraine and Russia, on the northern and northwestern coasts of the Black Sea and round the Azov Sea.

The population of *P. p. relicta* may consist of three or more subpopulations including those that spend much of the year in geographically and ecologically different areas, e.g. the Azov Sea, northwestern Black Sea, Sea of Marmara and northern Aegean Sea. The Bosporus Straits, the Sea of Marmara and the Dardanelles

Straits serve as conduits between the Black and Aegean Seas. Water flow at the surface is into the Aegean, from the Black Sea (Poulos *et al.* 1997). If porpoises were to leave the Black Sea, the conditions in the northern Aegean Sea (as compared to other parts of the Mediterranean) would remain similar to those of the Black Sea. The period of greatest similarity would be February and March (Poulos *et al.* 1997) and five out of the nine records from the Aegean occurred from mid January to the end of March (3 were in summer and 1 in October; all age classes have been found in the small available sample). Further work is needed to determine whether the animals found in the northern Aegean Sea represent a separate resident subpopulation.

Abundance: Total population size is unknown and therefore a synoptic region-wide survey is essential. Past Black Sea region-wide estimates based on strip transect surveys carried out in the USSR (1967-1974; Zemsky and Yablokov 1974) and Turkey (1987; Çelikkale *et al.* 1989) have been shown to be fundamentally flawed for a number of methodological and analytical reasons, making their use as indicators of absolute abundance unwarranted (e.g. IWC, 1992; Buckland *et al.* 1992). Consideration needs to be given as to whether, despite the identified problems, any of the data from those earlier surveys can be used in comparisons with data from future well-designed surveys to infer population change. Other estimates also suffered from inadequacies of survey design, record keeping and statistical analysis. Nevertheless, it was generally recognized (e.g. Tzalkin 1940a; Kleinenberg 1956; Geptner *et al.* 1976; Yaskin and Yukhov 1997) that during most of the 20th century, the abundance of harbour porpoises in the Black Sea was higher than that of bottlenose dolphins (*Tursiops truncatus ponticus*) and lower than that of common dolphins (*Delphinus delphis ponticus*).

Line transect surveys have been conducted recently to estimate harbour porpoise abundance in different parts of the range. In particular, aerial surveys were conducted in the Azov Sea, Kerch Strait (2001, 2002) and northeastern shelf area of the Black Sea (2002); vessel-based surveys were performed in the Kerch Strait, the entire 12-mi-wide zone of the Ukrainian and Russian Black Sea (2003), Georgian territorial sea (2005), and central part of the Black Sea between the Crimea peninsula, Ukraine, and Sinop province of Turkey (September–October 2005). Results of those surveys (Table 1) suggest that present total population size is at least several thousands and perhaps as much as 10,000-12,000.

Table 1 – Line transect surveys and harbour porpoise abundance estimates in selected portions of the Black Sea

Surveyed area and observation effort	Observation platform	Year	Research period	Available uncorrected abundance estimates	References
Azov Sea in total, 40,280 Km^2/2,735 km	Aircraft	2001	July, 4 days	2,922 (1,333–6,403; 95% CI)	Birkun *et al.* (2002)
Southern Azov Sea (within above area), 7,560 km^2/413 km	Aircraft	2001	July, 2 days	871 (277–2,735; 95% CI)	Birkun *et al.* (2003)
Southern Azov Sea (the same area), 7,560 km^2/716 km	Aircraft	2002	August, 1 day	936 (436–2,009; 95% CI)	Birkun *et al.* (2003)
Kerch Strait in total, 890 km^2/353 km	Aircraft	2001	July, 1 day	not available (too small sample size: 5 sightings, 12 animals)	Birkun *et al.* (2002)
Kerch Strait in total, 890 km^2/353 km	Aircraft	2002	August, 1 day	not available (too small sample size: 4 sightings, 4 animals)	Birkun *et al.* (2003)
Kerch Strait, 862 km^2/310 km	Vessel	2003	August, 6 days	54 (12–245; 95% CI)	Birkun *et al.* (2004)
NE shelf area of the Black Sea, 7,960 km^2/791 km	Aircraft	2002	August, 3 days	not available (too small sample size: 8 sightings, 15 animals)	Birkun *et al.* (2003)
NW, N and NE Black Sea within Ukrainian and Russian territorial waters, 31,780 km^2/2,230 km	Vessel	2003	September-October, 18 days	1,215 (492–3,002; 95% CI)	Birkun *et al.* (2004)
SE Black Sea within Georgian territorial waters, 2,320 km^2/211 km	Vessel	2005	January, 3 days	3,565 (2,071–6,137; 95% CI)	Birkun *et al.* (2006)
Central Black Sea beyond territorial waters of Ukraine and Turkey, 31,200km^2/660 km	Vessel	2005	September-October, 8 days	8,240 (1,714–39,605; 95% CI)	Krivokhizhin *et al.* (2006)

Population Trend In the 20th century, the number of Black Sea harbour porpoises was dramatically reduced by massive direct killing for the cetacean-processing industry that continued until 1983 (e.g. IWC 2004). The numbers of animals taken were not recorded accurately; much of the catch data was recorded as numbers of animals undifferentiated to species (all three Black Sea small cetacean species were targeted) and by wet weight aggregates (e.g. pounds or tons of dolphin/porpoise landed). However, it can be inferred that the population size of *P. p. relicta* was reduced due to the direct kills (totalling

some hundreds of thousands) by the time the total ban on dolphin hunting was enforced in the Black Sea region (see section "Threats"). It is strongly suspected that during the subsequent period from 1983-2006, not only did the population not recover but it declined markedly, primarily due to large-scale mortality in bottom-set gillnets (Birkun 2002a). In addition, there are other ongoing threats including human-induced habitat degradation (see "Threats" below). These threats are poorly managed in most Black Sea countries and therefore further decline of the population seems likely.

Habitat and Ecology

Harbour porpoises inhabit mainly shallow waters (0–200 m deep) over the continental shelf around the entire perimeter of the Black Sea, although they also occur quite far offshore in deep water. For instance, in late September – early October 2005, sizeable groups were observed in the central Black Sea, beyond the shelf edge some 38–215 km from the nearest coast in waters 450–2,170 m deep (Krivokhizhin *et al*. 2006). During warm periods they occur in the Azov Sea and Kerch Strait (Tzalkin 1940a; Kleinenberg 1956; Birkun *et al*. 2002) and in the Marmara Sea and Bosphorus (Öztürk and Öztürk 1997). Both of these small seas (as well as the northwestern Black Sea shelf zone) may represent geographically disjunct breeding-calving-feeding areas while the straits (Kerch and Bosphorus) connecting the seas serve as migration corridors.

Harbour porpoises undertake annual migrations, leaving the Azov Sea (Tzalkin 1938) and northwestern Black Sea (Birkun 2006) before winter and returning in spring. Such movements also may occur between the Black Sea and Marmara Sea; in the latter (along with the Bosphorus) there are no records for January-March (Öztürk and Öztürk 1997). The primary wintering areas are in the southeastern Black Sea (Birkun *et al*. 2006) including southern Georgian territorial waters and (perhaps) eastern Turkish territorial waters. These are also the well-known wintering grounds of Black Sea and Azov Sea populations of the anchovy (*Engraulis encrasicolus ponticus*) – a principal prey species for harbour porpoises during the cold season (Kleinenberg 1956). Most of the Black Sea porpoise population may congregate there every year. In January 2005 the density estimated for Georgian waters was 1.5 porpoises per km^2 (Birkun *et al*. 2006), i.e. 6–39 times higher than densities reported for any other Black/Azov Sea area surveyed in summer or autumn.

The mean group size varies from 1.4 to 7.7 in different areas (Birkun *et al*. 2002, 2003, 2004; Krivokhizhin *et al*. 2006) although during their seasonal migration, animals may remain for a few days at different sites (usually bays with abundant fish) forming dense aggregations of some hundreds of individuals, e.g. off the southern coast of Crimea in December-January 1994 (Laspi Bay), March 1995 (near Cape Meganom) and April 2005 (between Cape Aya and Cape Fiolent) (Birkun and Krivokhizhin, unpubl. data). Sometimes, early and rapid ice formation, arising immediately after an "Indian summer", can prevent animals leaving the Azov Sea and cause mass mortality due to ice entrapment (Kleinenberg 1956). The last recorded die-off of this kind occurred in November 1993 (Birkun and Krivokhizhin 1997); the number of animals could not be estimated. Black Sea harbour porpoises do not avoid waters with low salinity and high turbidity; they may occur in brackish bays and lagoons, and visit rivers and estuaries (all records occurring at warm times of the year).

The ecology of Black Sea harbour porpoises may be considered unusual. It reflects the high degree of geographical isolation of their habitat, relatively low water salinity, significant seasonal fluctuations of water temperature, and large amount of anoxic waters saturated with hydrogen sulphide, H_2S, below 100-250 m. At least 14 fish species have been recorded in the stomach contents (Tzalkin 1940a,b; Kleinenberg 1956; Tomilin 1957; Tonay and Öz 1999; Krivokhizhin *et al*. 2000; Birkun 2006), of which four are considered as the most important prey: anchovy, sprat (*Sprattus sprattus phalaericus*), whiting (*Merlangius merlangus euxinus*) and gobies (Gobiidae).

Threats

Until 1983, unregulated hunting was the primary threat (IWC 1992, 2004). Very large numbers of harbour porpoises, as well as other cetaceans, were taken during the 20th century by all Black Sea countries for a variety of industrial uses (Kleinenberg 1956; Tomilin 1957). Although the total number killed is unknown, it may have been as many as 4 or 5 million for all species combined (e.g. see review in Smith 1982). It is widely accepted that all Black Sea cetacean populations, including the harbour porpoises, were badly reduced by the directed fishery (IWC 1983, 1992, 2004). Catches of harbour porpoises were numerically fewer than those of common dolphins until 1964 when harbour porpoises became predominant (Smith

1982). From 1976 to 1981, harbour porpoises were believed to account for 80% of the total catch of cetacean fisheries in Turkey, with 34,000 to 44,000 taken annually (IWC 1983). At least since 1991, there has been no evidence of illegal directed takes although such takes had been reported before that time (IWC 1992).

At present, incidental mortality in fishing nets is the most serious threat (*e.g.*, Birkun 2002a). Although all three Black Sea cetacean species are bycaught, the majority (95%) of recorded cetacean entanglements are of porpoises. Unfortunately, absolute numbers of removals cannot be estimated from the available data. However, there are indications that the annual level of harbour porpoise bycatch may be in the thousands. Almost all (>99%) of the porpoises are caught in bottom-set gillnets for turbot (*Psetta maeotica*), spiny dogfish (*Squalus acanthias*) and sturgeon (*Acipenser* spp.). The peak occurs from April–June during the turbot season in the Azov Sea and Kerch Strait and throughout the shelf area of the Black Sea, including territorial waters of all six riparian countries. Almost all (99.9%) recorded bycatches are lethal (BLASDOL 1999). Illegal, unreported or unregulated fishing is widespread in the Black and Azov Seas and a significant proportion of the bycatch may occur in such operations.

An explosion at a gas-drilling platform in the Azov Sea in August 1982 resulted in the deaths of over 2,000 porpoises (Birkun 2002b).

Large-scale pelagic and small-scale coastal fisheries may affect Black Sea harbour porpoises indirectly by reducing their prey populations and degrading their habitat. Primarily, this relates to anchovies and sprats in the Black Sea and gobies in the Azov Sea. In particular, overfishing, eutrophication and the population explosion of an introduced predator, the ctenophore *Mnemiopsis leidyi*, led to a dramatic (8 to 12-fold) decline of sprat and anchovy abundance in the early 1990s (Prodanov *et al.* 1997). This reduced prey availability coincided with two mass mortality events (in 1989 and 1990) that, although they affected all three cetacean species, primarily affected porpoises (Birkun 2002c). Severe pulmonary nematodosis, caused by *Halocercus* spp. and complicated by bacterial super-infection, was recognized as a primary cause of the deaths, which were mainly of young animals. For other species, it has been hypothesised that malnutrition along with immuno-suppression associated with PCB contamination provokes or intensifies the effects of epizootics (e.g. Mediterranean striped dolphins; Aguilar and Borrell, 1994). Reported levels of DDTs and HCHs in Black Sea harbour porpoises are higher than those in conspecifics elsewhere in the world (Tanabe *et al*. 1997). Chemical pollution is thus also a potential threat, particularly in the context of epizootics.

Black Sea harbour porpoises are also affected in some years by ice entrapment in the Azov Sea (see section “Habitat”).

Conservation measures

The Black Sea population of harbour porpoises has been listed as Vulnerable in the IUCN Red List of Threatened Animals since 1996.

Commercial hunting of Black Sea cetaceans, including harbour porpoises, was banned in 1966 in the former USSR (present Georgia, Russia and Ukraine), Bulgaria and Romania, and in 1983 in Turkey. The riparian states assumed international obligations to protect Black Sea cetaceans as contracting parties of the Convention on Biological Diversity (CBD), Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention), Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, Appendix II), and the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). The harbour porpoise, *P. phocoena*, is mentioned in Annex II of the EC Directive No.92/43/EEC on the conservation of natural habitats of wild fauna and flora. In 1996, the Ministers of Environment of Black Sea countries adopted cetacean conservation and research measures within the framework of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (paragraph 62). The harbour porpoise is included as Data Deficient in the regional Black Sea Red Data Book (1999). However, in 2002 it was listed as Endangered in the Provisional List of Species of the Black Sea Importance, an annex to the Black Sea Biodiversity and Landscape Conservation Protocol of the Bucharest Convention.

On a national level, Black Sea cetaceans, including harbour porpoises, are protected by environmental

laws, governmental decrees and national Red Data Book listings. The harbour porpoise is listed in the Red Data Books of Bulgaria, Russia and Ukraine, which do not use the IUCN categories and criteria. In Russia and Ukraine, inscription in national Red Data Books means that the species should be monitored and managed by appropriate state/national programmes. Such a programme has existed in Ukraine since 1999 (the Delfin-programme adopted by the Ministry of Environment). Action plans for the conservation of Black Sea cetaceans were produced in Ukraine (2001) and Romania (2003) but they have no legal effect. In 2003-05 nine coastal protected areas were joined to form the Ukrainian National Network for Cetacean Conservation, an informal network consisting of 19 institutions (operational units) situated in 17 localities along the seaboard of Ukraine. Those protected areas are (from west to east): the Dunaisky [Danube] Biosphere Reserve, Chernomorsky (Black Sea) Biosphere Reserve, Swan Islands Branch of the Crimean Nature Reserve, Cape Martyan Nature Reserve, Karadag Nature Reserve, Opuk Nature Reserve, Kazantip Nature Reserve, Azov and Sivash National Park, and Meotida Landscape Park. The inventory of cetacean habitats has been completed and a common methodology for cetacean monitoring has been introduced in these protected areas. The ACCOBAMS Implementation Priorities for 2002-06 (Notarbartolo di Sciara 2002) envisage the development of a pilot conservation and management project in the well-defined area between Cape Sarych and Cape Khersones, southern Crimea (Ukraine).

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Sperm whale (*Physeter macrocephalus*) Mediterranean subpopulation

Taxonomy

Family

Physeteridae

Relevant Common Names

EN	sperm whale
FR	cachalot
ES	cachalote
SQ	kashalot
AR	عنبر (anbar)
HR	ulješura
EL	φυσητήρας (fysitíras)
HE	ראשתן (roshtan)
IT	capodoglio
ML	gabdoll
PT	cachalote
TR	İspermeçet balinası, kaşalot

Assessment Information

Endangered (EN C2a(ii))

Year Assessed

2006

Assessor(s)

Giuseppe Notarbartolo di Sciara, Alexandros Frantzis, Giovanni Bearzi, Randall R. Reeves

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

The listing proposed is EN C2a(ii). As explained below, this listing is based on inference leading to the following assumptions:

1. The Mediterranean sub-population, which is genetically distinct, contains fewer than 2,500 mature individuals;
2. There is a continuing decline in numbers of mature individuals;
3. All mature individuals are in one undivided subpopulation.

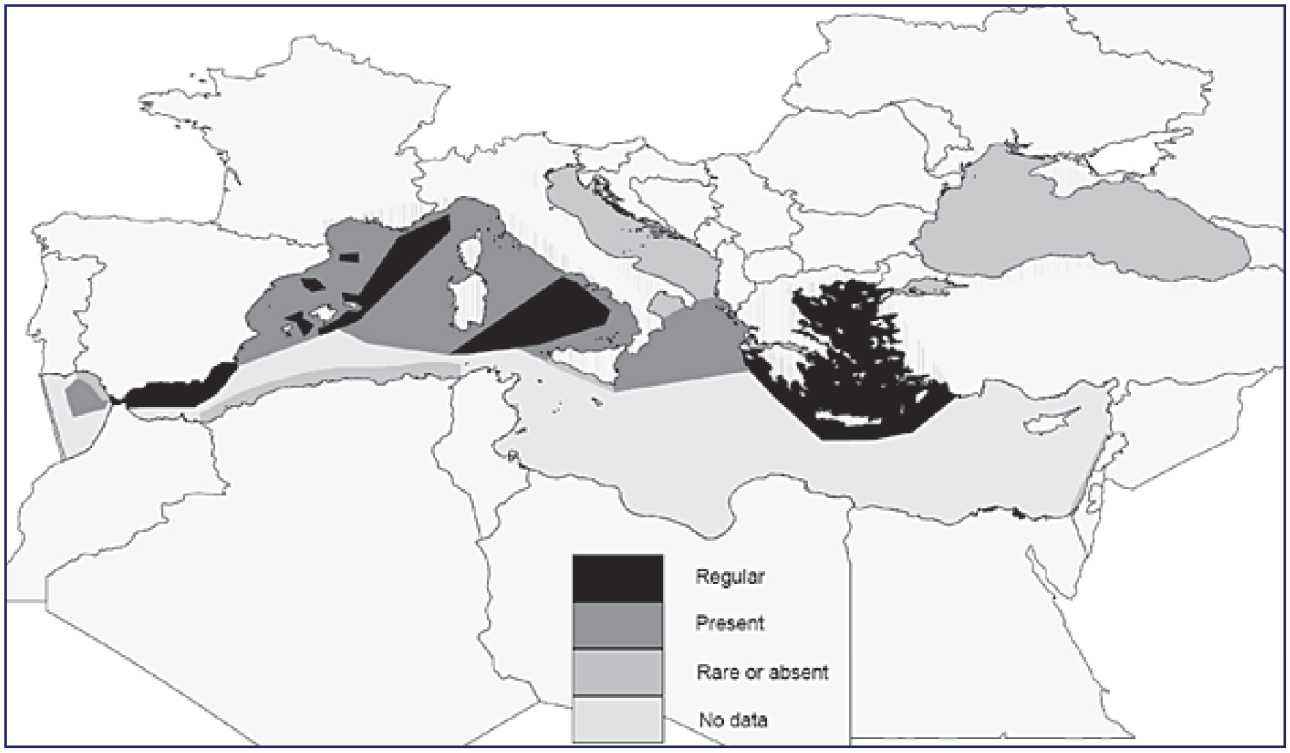
1. Although no past or present abundance estimate is available for the entire range of the sub-population, some data are available for limited areas within the region. If data from the Hellenic Trench can be extrapolated to the entire region, only 45% of the total present-day Mediterranean sub-population is mature. In other parts of the world this value can be as high as 85%. Those two extremes would require the total number of sperm whales to be either 2,950 (if 85% are mature) or 5,555 (if 45%) if there were to be 2,500 or more mature individuals. Given present knowledge, it is unlikely that there are enough sperm

whales in the region to infer a number of mature individuals anywhere near 2,500.

2. The Mediterranean subpopulation is subject to a number of threats that can result in direct mortality. These include bycatches in fishing gear (especially drift gillnets) and ship strikes. In addition, the subpopulation may be affected by disturbance, particularly related to intense maritime traffic. It is suspected that a combination of these factors has led to decline (of unknown magnitude) over the last half-century.

3. Genetic data from a sample of sperm whales across the Mediterranean have not provided evidence for within-region population structure (Drouot *et al.* 2004; Engelhaupt 2004). Sperm whales are thought to roam widely across the Mediterranean, and it is parsimonious to assume that they form a single subpopulation within the basin.

Distribution



Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania	X						
Algeria	X						
Bosnia and Herzegovina				X			
Croatia			X				
Cyprus	X						
Egypt	X						
France	X						
Gibraltar (UK)	X						
Greece	X						
Israel	X						
Italy	X						
Lebanon		X					
Libya		X					
Malta	X						
Monaco	X						
Morocco	X						
Palestinian Territory		X					
Serbia and Montenegro				X			
Slovenia				X			
Spain	X						
Syria		X					
Tunisia	X						
Turkey	X						

Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea

Taxonomy

Although *Physeter catodon* is still occasionally used in the literature, *P. macrocephalus* is recommended (Rice 1998). Both names are listed on the same page of the original description by Linnaeus (1758), and priority is unclear. However, *P. macrocephalus* is preferable because it is used much more frequently, and this will support nomenclatural stability.

Geographic Range

In the Mediterranean Sea, sperm whales are widely distributed from the Gibraltar Strait area in the west to the Levant Basin in the east. Known in the past to have been predictably present in parts of the Gibraltar Strait area, around the Balearic Islands, in the Algerian-Ligurian Basin, in the Tyrrhenian Sea, in the deep waters to the north, east and southeast of Sicily, in the Ionian Sea and in parts of the Aegean Sea; still fairly predictable in the Gibraltar Strait and along the Hellenic Trench from the NE Ionian Sea to the NW Levant Basin. Rare in the Sicilian Channel. Vagrant in the Adriatic Sea. Absent from the Black and Marmara Seas.

Population

No estimate of population size exists for the region. Gannier *et al.* (2002) reported the highest encounter rates in the northwestern portions of the Mediterranean, especially near the Gulf of Lions, and in eastern coastal areas of the Ionian Sea, especially off the Greek Islands. Estimated abundance for the Ionian Sea in 2003, based on surveys combining visual and acoustic techniques, was 66 individuals (with 95% lognormal confidence limits 28 – 156) (IFAW 2006). No sperm whales were observed on-transect during a survey of the Strait of Sicily (IFAW 2006). These results are consistent with the number of photo-identified sperm whales along the Hellenic Trench (see below). Preliminary results from a survey of a large portion of the western basin (from Gibraltar to Sicily and bounded on the north by a line from the Balearics east to Sardinia) in Summer 2003 indicate a sperm whale detection rate roughly eight times that in the Ionian Sea (T. Lewis, IFAW, pers. comm.). This suggests that sperm whale numbers are significantly higher in the western basin than in the Ionian Sea, but still are likely to be only in the low to mid hundreds. Gannier *et al.* (2002) provided sperm whale visual and acoustic encounter rates for a large portion of the Mediterranean sea, however no absolute abundance estimates can be derived from their data. About 150 individuals have been photo-identified in the Mediterranean Sea during the last decade (NAMSC 2004). Almost 100 of these (22 solitary males and 11 social units) were photo-identified along the Hellenic Trench during eight years of intense research effort. In this particular area the re-sighting rate expressed as the number of sightings of mature males or social units already photo-identified in previous years ("re-captures") divided by the total number of sperm whale sightings was roughly 0.5 for both solitary males and social units during the last two field seasons (Frantzis unpubl.). These estimates relate to the population that uses the Hellenic Trench study area, including animals that are regularly observed there and animals that are occasional visitors. The variable amount of time that individual whales spend in the area introduces heterogeneity of capture probabilities, which will result in an underestimate of the total number of animals using the area. Animals that never visit the Hellenic Trench obviously will not be included in these estimates. In the Ligurian Sea, known to contain one of the most productive pelagic areas in the Mediterranean, only 40 sperm whales have been photo-identified during 15 years of intensive research (Tethys Research Institute, unpublished), suggesting that density there is low. In the Strait of Gibraltar 21 individuals were identified during the last 8 years (de Stephanis *et al*. 2005). Based on all of the above information, the total number of sperm whales in the Mediterranean region is more likely in the hundreds than the thousands.

No evidence exists of population fragmentation across the region.

Population Trend

↓ (probably)

Detailed Documentation

Range and Population

Genetic data suggest that sperm whales in the Mediterranean constitute a separate population. Drouot *et al.* (2004), comparing eastern North Atlantic specimens with 13 individuals sampled in the Tyrrhenian Sea, Ionian Sea, northwestern Mediterranean basin and Balearic Sea, found significant differences in mitochondrial DNA (mtDNA) haplotype frequencies, suggesting that the sperm whales in the Atlantic and Mediterranean belong to separate matrilineal complexes. Engelhaupt (2004) compared a sample of 23 male sperm whales from the Mediterranean with a much larger sample from the North Atlantic using the mtDNA control region and 16 microsatellite DNA loci. The Mediterranean sample had only one mtDNA haplotype, compared to haplotypic diversity of 0.65 in the North Atlantic, and the Mediterranean sample also exhibited lower microsatellite diversity. The Mediterranean animals were significantly differentiated from the North Atlantic animals at both the mtDNA control region and the microsatellite DNA loci, although the effect was much stronger for mtDNA, suggesting greater female than male philopatry (also A.R. Hoelzel pers. comm.). This is consistent with the frequent observations of the same groups of sperm whales in the Gibraltar Strait (Fernandez-Casado *et al*. 2001, de Stephanis *et al.* 2005), which could be primarily mature males. Other types of observations are consistent with the hypothesis of a high degree of isolation. All age classes of sperm whales are found within the Mediterranean, and the occurrence of neonates (Gannier *et al*. 2002, Frantzis *et al*. 2003, Moulins & Würtz 2005) confirms that calving takes place there. In the eastern Mediterranean, both social units and large males are present year-round. In other regions of the basin social units with calves seem to be rather infrequent (with the exception

of the Balearic Islands and the Strait of Messina historically). Moreover, Mediterranean sperm whales seem to have a particular repertoire of codas, the stereotyped patterns of clicks that sperm whales use for communication. Repertoire differences among populations have been interpreted as indicative of cultural differences (Whitehead 2003). Although more than 25 coda types have been recorded in the Mediterranean (Drouot & Gannier 1999, Frantzis & Alexiadou submitted), the coda repertoire is dominated by a pattern (the "3+1" coda) that is not common in adjacent waters of the Atlantic (Borsani *et al*. 1997, J. Gordon pers. comm.). More than 50% of codas produced by Mediterranean solitary males are "3+1" codas (Frantzis & Alexiadou submitted). .

There is evidence that sperm whales were formerly common in portions of the Mediterranean, such as in the Strait of Messina and the waters adjacent to the Eolian Islands (e.g., Bolognari 1949, 1950, 1951, 1957), at least until the 1950s. Bolognari (1949, 1950, 1951, 1957) reported the frequent occurrence of large "aggregations" or "clusters" (*sensu* Whitehead 2003), consisting of as many as 30 individuals, in the area of the Strait of Messina during winter in the late 1940s and early 1950s. Such large groups have not been recorded in more recent times in that area or anywhere else in the Mediterranean. When data on sperm whale encounter rates started to become available in the mid-1990s (Notarbartolo di Sciara *et al*. 1993; Marini *et al*. 1996), they were very low compared to the impression given by the historical records (Bolognari 1949, 1950, 1951, 1957). For example, in the waters adjacent to the northern and eastern coasts of Sicily, an intensive (and ongoing) programme of dedicated surveys in the Strait of Messina and surrounding waters, based on a combination of visual and acoustic techniques (S. Panigada and G. Notarbartolo di Sciara, unpublished), produced eight sperm whale sightings (total of only 9 individuals), all of them in winter, during 108 days of survey spanning 9 months..

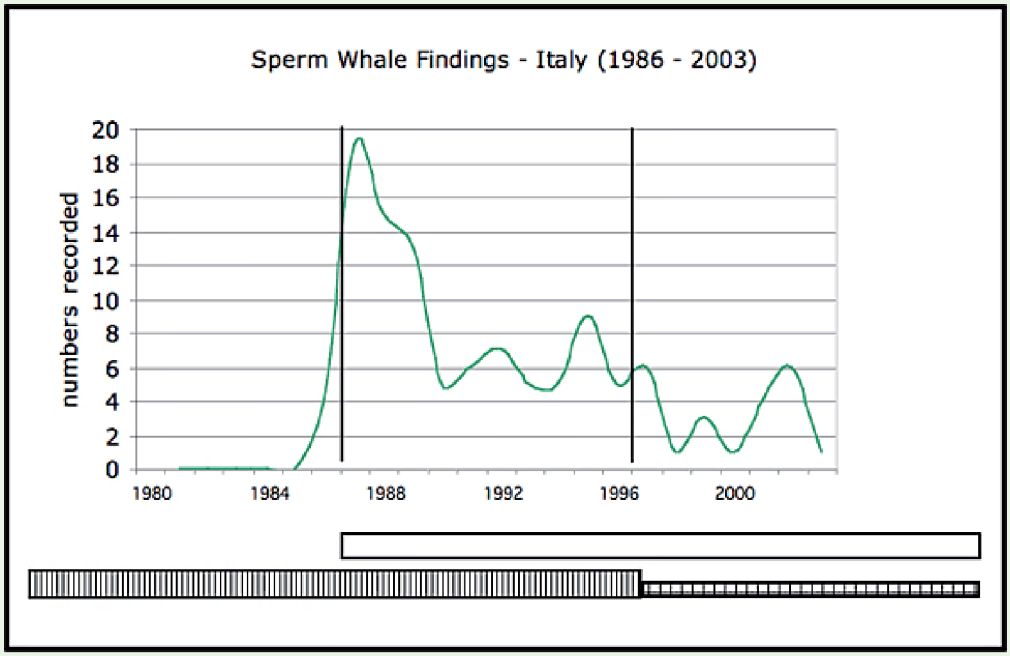


Fig. 1 – The term 'findings' is used here to cover stranded and floating carcasses as well as animals found entangled in fishing gear. The bars under the graph represent the time during which the Italian stranding network has been in operation (white bar), and the duration of driftnet activities by the Italian fleets (bar with vertical pattern and bar with small squares). The first full year of operation of the national stranding network (ongoing) was 1987. Bar with vertical pattern: driftnet operations in Italy were in full swing until 1996 (although around 1992 a few of the Italian vessels moved their operations to the Balearic Sea, most of the fleet continued to fish in the waters adjacent to Italy). Bar with small squares: after 1996 the fishery was phasing down, but illegal activities persist to the present day on a limited scale. The portion of the curve falling between the two vertical lines shows the decrease in sperm whale findings while the Italian driftnet fleet was fully operational (data in the graph are derived from the stranding reports by Centro Studi Cetacei). For a complete list of the reports see Notarbartolo di Sciara *et al.* (2004).

Sperm whales have declined considerably in the stranding records of France and Italy in the last decade, in stark contrast with the large numbers of individuals in the records in the 1987-1998 period (see also "Threats"), and in spite of the fact that efficiency of discovery and reporting of strandings has greatly

improved over time in the two countries (Notarbartolo di Sciara *et al.* 2004). This is best exemplified by the situation in Italy, the nation that in those years had the largest driftnet fleet (in excess of 700 vessels) operating throughout a significant portion of the central Mediterranean (Scovazzi 1998). In Italy the organised nation-wide recording of stranded, floating dead and entangled cetaceans began in mid-1986 (for a complete list of the annual stranding reports, see Notarbartolo di Sciara *et al.* 2004). The first full year in which such data were collected (1987) coincides with the highest value of sperm whale findings, 19 (Fig. 1), at least 13 of which involved capture in driftnets. Findings sharply decreased in the following years, stabilising at a mean of 4.6 animals/year between 1990 and 2003 (range: 1-9). This decrease did not coincide with a decrease in fishing effort, which started declining appreciably only after 1996 (Scovazzi 1998). Although a number of alternative explanations can be offered to account for the observed trend (such as movement of sperm whales out of the area, fluctuations in fishing effort, changes in area of fishing operations, etc.), the abrupt decline in the number of records, which corresponds with increased stranding detection and reporting, can also be interpreted as a possible sign of decreased availability of animals to become entangled in that area.

Mass strandings of sperm whales are extremely rare in the Mediterranean, and limited to ancient times: a stranding of 13 reported near Mazzara del Vallo, Sicily, by Antonino Mongitore in 1743, another stranding of 7 individuals reported from Marsala, Sicily, by Giuseppe Riggio in 1893 (Notarbartolo di Sciara & Bearzi 2004), and a stranding of 6 near Cittanova d'Istria, northern Adriatic Sea, in 1853 (Heckel, 1853).

Habitat and Ecology

Preferred sperm whale habitat in the Mediterranean consists mostly of continental slope waters where mesopelagic cephalopods, the species' preferred prey, are most abundant. Deeper offshore waters are also inhabited, but perhaps to a lesser degree.

Adult males of oceanic populations are known to segregate from social units of females and immatures as they reach sexual maturity. Males live separately from the social units in higher latitudes, some reaching as far as the ice edge. Some of the larger adult males migrate latitudinally to join social units, which remain in warmer waters year-round. These males rove between social groups, associating with a given social group for only a few hours at a time, presumably just long enough to breed (Whitehead 2003). A generally similar social system may occur in parts of the western and central Mediterranean, with males segregating during summer in the northern part (roughly north of 41° N), while social units remain in the south (Drouot *et al.* 2004), although the latter may be found occasionally in the north as well (Moulins & Würtz 2005). In some parts of the eastern basin, social units of females with immatures and solitary mature males are both found in the same area year-round (Frantzis *et al*. 1999, 2003), although in the northern part of the Hellenic Trench only social units are present and large males are rarely seen in a reproductive context among them. These social units typically consist of 10-12 individuals including at least 1-2 calves (Gannier *et al*. 2002). Social units seem to be stable, but members of one unit have been observed to associate with other units (Frantzis, unpubl.), as has been described for oceanic populations (Whitehead 2003).

It is unclear whether sperm whales have regular movement patterns within the Mediterranean, although a highly speculative scheme, yet to be confirmed, was proposed by Bolognari (1949). At least in the eastern Mediterranean, both solitary males and social units may remain in a limited area for more than a month, or may visit that area repeatedly during the same summer season, indicating that they stay in neighbouring waters (Frantzis unpubl.). Many solitary males and some social units have been re-sighted in the same area for up to four consecutive years during ongoing long-term studies (Frantzis *et al*. 2003; Frantzis unpubl.). Information on the reproductive behaviour and ecology of sperm whales in the Mediterranean remains sparse. There was no apparent distinction between feeding and breeding grounds along the Hellenic Trench, where sperm whales had been studied for nine years as of 2006 (Frantzis unpubl.). Both solitary males and social units of sperm whales are thought to feed throughout their range, and short, apparently reproductive associations of mature males with social units have been observed in the Ionian Sea (Frantzis unpubl.).

Threats

The most likely cause of recent decline of sperm whales in the Mediterranean is entanglement in high-seas swordfish driftnets, which has caused considerable mortality since the mid-1980s (Notarbartolo di Sciara 1990; International Whaling Commission 1994). Such mortality is ongoing (Tudela *et al.* 2003;

ACCOBAMS 2003; Pace *et al.* 2005). The recorded number of sperm whales found dead or entangled during the last three decades (from 1971 to 2004) in Spain, France and Italy (combined) was 229, and there is no reason to believe that documentation is anywhere near complete. The large majority of the strandings in Italy and Mediterranean Spain were caused by entanglement in driftnets, as evident from the reported presence of net fragments or characteristic marks on the whales' bodies (Podestà & Magnaghi 1989, Lazaro & Martin 1999). Cagnolaro & Notarbartolo di Sciara (1992) reported that for 83% of 347 cetaceans stranded in Italy from 1986 to 1990 (inclusive), which included 56 sperm whales, the likely cause of death was related to entanglement. Despite international and national regulations banning driftnets from the Mediterranean, illegal or quasi-legal driftnetting continues in sperm whale habitat, not only in the western Mediterranean (e.g., in France, Italy, and Morocco) but recently also in the eastern basin (e.g., Greece and Turkey), thereby continuing to threaten the species' survival in the region.

Although the continuation of driftnet fishing by non-EU Mediterranean fleets and illegal EU operations represent the most important ongoing threat to sperm whales in the Mediterranean Sea, the disturbance from intense marine traffic (development of 'highways of the sea') and collisions with vessels, especially hydrofoils and other passenger craft including high-speed ferries (e.g., see de Stephanis *et al.* 2003, 2005), may be serious as well. More than 6% (7) of 111 sperm whales stranded in Italy (1986-1999) and Greece (1982-2001) had died after being struck by a vessel, and 6% of 51 photo-identified individuals (39 in Greece and 22 in Italy) bore wounds or scars that were clearly caused by a collision (Pesante *et al.* 2002). Underwater noise from mineral prospecting (seismic airguns), military operations, and illegal dynamite fishing are other sources of concern (Notarbartolo di Sciara & Gordon 1997). Dynamite fishing is still a common activity in large portions of the eastern and southern Mediterranean, where feeding and socializing sperm whales are present year-round (Frantzis *et al*. 2003).

Conservation measures

An international sanctuary for the conservation of Mediterranean cetaceans was recently established, encompassing key cetacean habitat in portions of the Provençal, Corsican, Ligurian, Tyrrhenian and northern Sardinian Seas. However, large portions of what is likely critical habitat for sperm whales in the Mediterranean region fall outside any type of protective regime. Sperm whales are listed by the Bonn Convention - CMS (Appendix I), the Bern Convention (Appendix II), CITES (Appendix I), the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (a priority species for conservation action) and the Protocol on Specially Protected Areas and the Biological Diversity in the Mediterranean of the Barcelona Convention (Annex II). The International Convention for the Regulation of Whaling confers full protection from commercial whaling on sperm whales under the moratorium on commercial whaling that took effect from 1986.

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Striped dolphin (*Stenella coeruleoalba*)
Mediterranean subpopulation

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	striped dolphin
FR	dauphin bleu et blanc
ES	delfín listado
AR	دلفين أزرق وأبيض (delfin azraq wa abyad)
HR	prugasti dupin
EL	ζωνοδέλφινο (zonodélfino)
HE	סטנלה מפוספסת (stenella mefuspeset)
IT	stenella striata
ML	stenella
PT	golfinho riscado
TR	cizgili vunus

Assessment Information

Vulnerable (VU A4d,e)

Year Assessed

2006

Assessor(s)

Alex Aguilar

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

VU A4d,e: The species has been, and is currently, subject to a number of threats, the combined effects of which give cause to suspect a reduction in total population size of at least 30% over three generations (ca. 60 years) encompassing both the past and the future (A4). The principal causative factor is incidental mortality in fishing gear, particularly in pelagic driftnets, which is suspected to have been high (in the 1000s/year) during at least the last two decades and is continuing (A4d). In addition, a reduction in population size is suspected to have occurred in 1990-92 as a result of a large-scale die-off caused (proximally at least) by an epizootic (A4e). The incidental mortality has not ceased and the causal factors involved in the early 1990s die-off are neither well understood nor resolved.

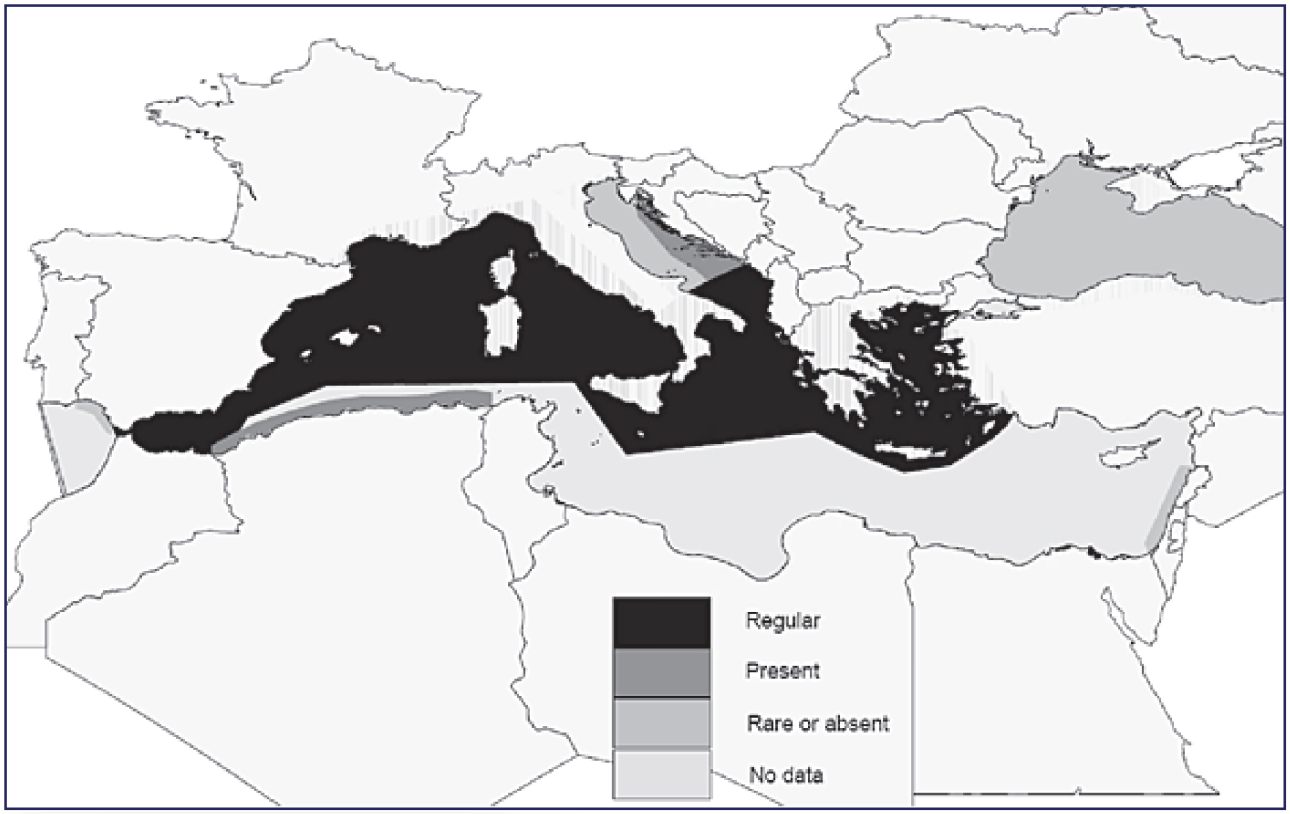
The 1990-92 epizootic devastated the whole Mediterranean population of striped dolphins, producing many 1000s of deaths (Bortolotto et al., 1992; Aguilar and Raga, 1993). The primary cause was a morbillivirus infection (Domingo et al., 1990) but PCBs and other organochlorine pollutants with potential for immunosuppressive effects may have triggered the event or enhanced its spread and lethality (Aguilar and Borrell, 1994). Organochlorine pollutants are found at levels in Mediterranean striped dolphins that greatly exceed thresholds of reproductive impairment in bottlenose dolphins elsewhere.

Moreover, unusual luteinized cysts, with the potential to impede ovulation, have been found in the ovaries of Mediterranean striped dolphins; these cysts have also been associated with the high levels of PCB exposure. The occurrence of the cysts and the reproductive impairment induced by PCBs may be depressing reproductive rates, hence inhibiting demographic recovery. Finally, decreased food availability caused by fishing overexploitation is an added potential limitation to recovery.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania		X					
Algeria	X						
Bosnia and Herzegovina				X			
Croatia			X				
Cyprus	X						
Egypt		X					
France	X						
Gibraltar (UK)	X						
Greece	X						
Israel	X						
Italy	X						
Lebanon		X					
Libya		X					
Malta	X						
Monaco	X						
Morocco	X						
Palestinian Territory		X					
Serbia and Montenegro				X			
Slovenia				X			
Spain	X						
Syria		X					
Tunisia	X						
Turkey	X						



Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea

Geographic Range

Temperate and subtropical waters of all oceans. Present throughout the Mediterranean Sea but has not been recorded in the Black Sea.

Population

The most abundant cetacean in the Mediterranean. Population in the western Mediterranean excluding the Tyrrhenian Sea (1991) estimated at: 117,880 (95%CI=68,379-214,800) (Forcada et al., 1994). There is no estimate for the eastern Mediterranean Sea.

Population Trend

Declined in the early 1990s, current trend uncertain.

Detailed Documentation

Range and Population

Mediterranean population as a designatable unit: Morphological and genetic studies strongly suggest that the Mediterranean and eastern North Atlantic populations are isolated from each other, with little or no gene flow across the Straits of Gibraltar. Maximum body length of eastern North Atlantic striped dolphins is 5-8 cm longer than that of Mediterranean individuals (Calzada and Aguilar, 1995). Skull size is also smaller in Mediterranean specimens than in their neighbouring Atlantic counterparts (Archer, 1997). Mitochondrial

DNA analysis yielded 27 haplotypes, none of which was shared between the two areas, thus supporting differentiation (García-Martínez et al. 1995).

Sub-population structure: Inside the Mediterranean there is some clinal variation in body size suggestive of population structure and/or restriction in gene flow between areas (Calzada and Aguilar, 1995); this appears to be confirmed by significant differences in tissue pollutant levels between Spain and Italy (Monaci et al., 1998). Gaspari (2004) considered dispersal range sufficiently limited between populations across the Mediterranean, and possibly between inshore and offshore populations within the Ligurian Sea, to make differentiation feasible.

Generation time: Generation time for this dolphin population has been estimated as 22 years for females (Calzada et al., 1996; Calzada et al., 1997) and 20 for males (Calzada et al., 1996). It is therefore appropriate to use the default value for small delphinids of 20 years (see main text of workshop report).

Range and population: Although overall the striped dolphin is the most abundant cetacean in the Mediterranean, both in the eastern and the western basins, it is not found at uniform densities. It typically shows a preference for highly productive, open waters beyond the continental shelf (Notarbartolo di Sciara et al., 1993; Forcada et al., 1994; Frantzis et al., 2003; Gannier, 2005). Two strandings were recorded in the Marmara Sea in 1990s (Öztürk *et al*., 1999).

Reliable abundance estimates are available only for the western basin and most of them refer to the period immediately or soon after the 1990-1992 die-off:

Western Mediterranean excluding the Tyrrhenian Sea (1991): 117,880 (95%CI=68,379-214,800) (Forcada et al., 1994)
Balearic Sea (1991): 5,826 (95%CI=2,193-15,476) (Forcada and Hammond, 1998)
Gulf of Lions (1991): 30,774 (95%CI=17,433-54,323) (Forcada and Hammond, 1998)
Ligurian Sea (1992): 14,003 (95%CI=6,305-31,101) (Forcada et al., 1995)
South Balearic area (1991): 18,810 (95%CI=8,825-35,940) (Forcada and Hammond, 1998)
Alboran Sea (1991): 17,728 (95%CI=9,507-33,059) (Forcada and Hammond, 1998)
Central coast of Spain (2000-2002): 15,778 (95%CI=10,940-22,756) (Gómez de Segura *et al.*, 2006)

Habitat and Ecology

Oceanic, with a preference for highly productive, open waters beyond the continental shelf. Particularly abundant in the Ligurian Sea, the Gulf of Lions, the waters between the Balearic Islands and the Iberian Peninsula, and the Alborán Sea.

Threats

In the past, striped dolphins were hunted for use as bait for shrimp traps and longlines. Despite being prohibited, catches with this aim continue in at least southern Spain and probably other areas.

Incidental captures in pelagic drift nets have been a major source of mortality all over the western Mediterranean in the past. These nets are still being used by at least Italian, Greek and Moroccan vessels, resulting in extensive dolphin mortality. The Spanish driftnet fishery in the Alborán Sea reportedly killed 145-183 striped dolphins per season in the early 1990s (Silvani et al., 1999); this fishery was halted in 1995 but the nets were transferred to Moroccan boats, which continue operating and have been estimated to kill more than 3,600 dolphins (striped and common, combined) in the Alborán Sea per year (Tudela et al. 2005). The Italian drift net (*spadare*) fishery is estimated to have killed thousands of striped dolphins per year through at least the early 1990s (Di Natale, 1992, 1995); although fishing effort has declined, mortality is still observed in Italian waters. The French *thonaille* drift net fishery has been estimated to take about 180-472 striped dolphins per season (Imbert et al., 2001). Reports from other fishing activities are sparse and collected non-systematically, but they indicate that striped dolphin mortality in at least pelagic purse-seines, longlines and gillnets is widespread and likely significant (Di Natale and Notarbartolo di Sciara, 1994). To this should be added a certain number of direct catches for human consumption or for use as bait, which continue in several Mediterranean countries (SGFEN, 2001).

In 1990-1992 a die-off devastated the whole Mediterranean population; > 1000 carcasses were examined

in Spain, Italy and France alone, but the toll was undoubtedly much higher because these countries represent only a fraction of the Mediterranean coastline known to have been affected (Bortolotto et al., 1992; Aguilar and Raga, 1993). The primary cause of the die-off was a morbillivirus infection (Domingo et al., 1990), but PCBs and other organochlorine pollutants with potential for causing immunosuppressive effects were suggested to have triggered the event and/or enhanced its spread and lethality (Aguilar and Borrell, 1994).

Tissue levels of organochlorine compounds, some heavy metals and selenium are high and exceed threshold levels above which detrimental effects commonly appear in mammals (Aguilar, 2000). Blubber concentrations of DDT (an agricultural pesticide) and PCB, the two main organochlorine pollutants, show a slowly declining trend in the last two decades (Aguilar and Borrell, 2005) but are still high. An association has been reported between high PCB levels and the presence of unusual luteinized cysts in the ovaries of Mediterranean striped dolphins (Munson et al., 1988).

The diet of striped dolphins includes commercial fish and cephalopod species (Pulcini et al., 1993; Blanco et al., 1995), so the widespread depletion of fishing resources in the Mediterranean has the potential to affect striped dolphin numbers by reducing the availability of food for them.

Conservation measures

No specific measures have been taken for the conservation of striped dolphins in the Mediterranean Sea, although generic protection laws for cetaceans exist in many range states.

One area where the species is relatively abundant is the Marine Sanctuary for Cetaceans in the Corso-Ligurian Basin, declared by the Governments of Italy, France and Monaco. Apart from this, because the striped dolphin is an oceanic species, most existing protected areas are of no use for its conservation. Establishment of offshore protected areas through international agreements similar to that for the Ligurian Sea should be encouraged. A governmental initiative in Spain to identify areas of special interest for the conservation of cetaceans led to recommendations but no implementation thus far. Better management and enforcement is needed in existing protected areas and additional initiatives should be undertaken in more Mediterranean countries, especially in the eastern portion of the basin.

Pelagic driftnets have been prohibited in Spain and their use has been limited by EU regulations since 2002. However, a reduced Italian fleet still fishes with such gear in an unregulated manner (Pace et al., 2005), as does a large Moroccan fleet and the French *tonnaille* vessels (Imbert et al., 2001, 2002; Tudela et al., 2005). All of these operations are known to cause substantial cetacean mortality. Driftnets should be eliminated from the region or, at a minimum, existing regulations on that gear need to be strictly enforced. Most Mediterranean countries have regulations prohibiting direct takes, and these too need to be enforced more rigorously.

Control of pollution, particularly that by organochlorine compounds, has begun to take hold in the last two decades and pollutant levels are decreasing. However, existing laws and control should be further enforced and striped dolphin populations should be monitored to assess trends and geographical variation in tissue levels. There is a particular need for sampling in the southern and eastern Mediterranean.

The population was quantified in the western Mediterranean immediately after the 1990 die-off. Abundance should be monitored to assess changes in abundance through time, particularly to assess recovery from the die-off.

Occurrence of ovarian cysts should be monitored in the population and their potential impact on reproduction should be investigated.

Diet should be studied through stomach content and isotopic analyses to assess overlap with commercial fisheries.

Stranded dolphins should be monitored for establishing prevalence of morbillivirus infection.

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Common bottlenose dolphin (*Tursiops truncatus*) Mediterranean subpopulation

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	common bottlenose dolphin, bottlenose dolphin
FR	grand dauphin, dauphin souffleur
ES	delfín mular
SQ	delfin i madh
AR	دلفين كبير (delfin kabir)
HR	dobri dupin
EL	ρινοδέλφινο (rinodélfino)
HE	דולפינן ים- התיכון (dolphinan yam hatichon)
IT	tursiope
ML	delfin geddumu qasir
TR	afalina

Assessment Information

Vulnerable (VU A2c,d,e)

Year Assessed

2006

Assessor(s)

Giovanni Bearzi and Caterina Maria Fortuna

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

This subpopulation qualifies for listing as Vulnerable based on criterion A2c,d,e.

Generation time for odontocete cetaceans has been estimated as 21-33 years under varying assumptions of population status (see main text of workshop report). The maximum age of 70 years and first-year survivorship of 0.84 used to obtain that estimate are likely too high for small odontocetes such as bottlenose dolphins. Therefore, a generation time near the lower end of this range, or about 20 years, was used for this species, making the 3-generation period go back to ca. 1946.

In northern portions of the Mediterranean basin, there is a well-known history of intentional killing, including extensive extermination campaigns conducted until at least the early 1960s, and there has been (and continues to be) substantial incidental mortality in fishing gear (A2d). It is not possible, however, to make robust estimates of either kind of mortality for other than short periods and limited areas within the total subpopulation range. There is strong evidence that overfishing of dolphin prey has resulted in a form of habitat loss and degradation and likely also in a decline in area of occupancy (A2c). Other factors, such as disturbance by marine traffic, may be contributing to those processes. High levels of contamination by

pollutants are another source of concern (A2e). Of the identified threats, only the extermination campaigns have ceased.

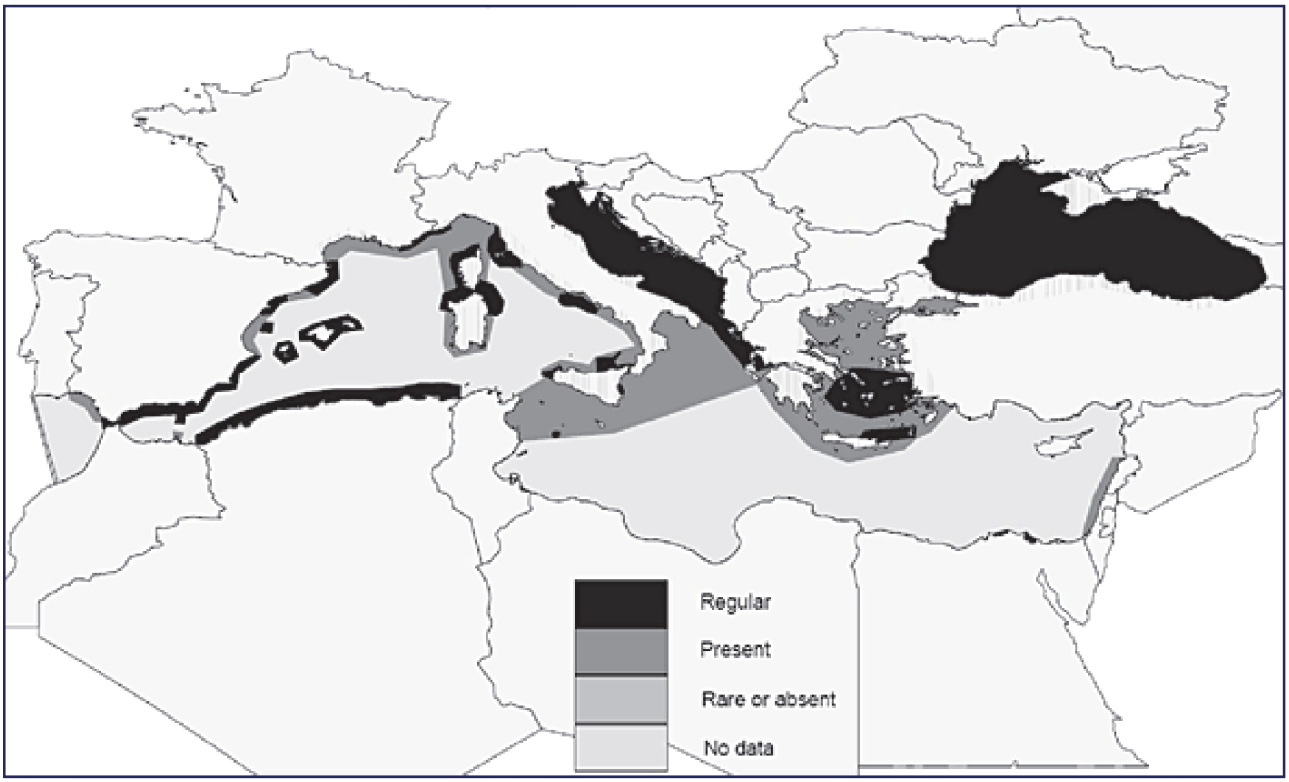
According to literature from the 19th century, "dolphins" were abundant throughout Mediterranean coastal waters. On the northern side of the basin, the animals were mostly seen as vermin, and one of the main concerns of fishery managers from the late 18th century onwards was to develop and deploy new means of killing the largest possible number of dolphins. Conflict with fisheries was reportedly acute in several areas of Spain (A. Aguilar, pers. comm.), France, Italy, and former Yugoslavia (today's Slovenia, Croatia, Serbia and Montenegro), where thousands of animals were killed for bounties (Bearzi *et al*. 2004). Bottlenose and common dolphins were the main targets of the extermination campaigns in Mediterranean coastal areas. Numbers of bottlenose dolphins in some areas where they were formerly high are now low, and this pattern can reasonably be extrapolated to other areas in the northern part of the basin. Given this, a reduction in population size of more than 30% since 1946 is suspected.

Although the listing proposed here treats the bottlenose dolphins throughout the entire Mediterranean Sea as a single unit, groups inhabiting smaller areas may represent separate subpopulations. In some of these areas, such as the Adriatic Sea, the species has declined dramatically (quite likely by at least 50%) over the past 50 years (Bearzi *et al*. 2004), and would therefore qualify as Endangered if assessed on their own. Other geographically isolated bottlenose dolphin subpopulations are known to reside within relatively small semi-closed basins such as the Amvrakikos Gulf in western Greece (400 km^2), where they exhibit specialized behaviour and feeding habits and face a high risk of local extinction. Therefore, the proposed listing for a single subpopulation should be seen as a step towards a definitive assessment of the species in the Mediterranean but not as a final resolution.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania		X					
Algeria	X						
Bosnia and Herzegovina		X					
Croatia	X						
Cyprus	X						
Egypt		X					
France	X						
Gibraltar (UK)	X						
Greece	X						
Israel	X						
Italy	X						
Lebanon		X					
Libya	X						
Malta	X						
Monaco		X					
Morocco	X						
Palestinian Territory		X					
Serbia and Montenegro	X						
Slovenia	X						
Spain	X						
Syria		X					
Tunisia	X						
Turkey	X						



Summary Documentation

Biome

Marine, estuarine

Major Habitat(s)

Primary habitat:
Open Sea
Shallow Sea
Subtidal Aquatic Sea Beds

Secondary habitat:
Estuarine Waters
Coastal Brackish/Saline Lagoons
Permanent Inland Deltas

Taxonomy

Of the two species presently recognized within the genus *Tursiops*, the common bottlenose dolphin *T. truncatus*, and the Indo-Pacific bottlenose dolphin *T. aduncus*, only the former is known to occur in the Mediterranean Sea and North Atlantic Ocean.

Geographic Range

Bottlenose dolphins are widely distributed throughout the Mediterranean Sea. Although historically their distribution may have been continuous, at least in coastal waters, it is now marked by gaps with low densities that may be either natural or the result of anthropogenic effects (e.g. intensive exploitation, whether deliberate or indirect; habitat degradation or loss). Range includes inshore, coastal and offshore waters to near the continental slope.

Population

Total population size unknown but may be in the low 10,000s based on observed densities in areas that have been surveyed (Table 1). Common. Further subpopulation structure exists and may require future

assessments at a finer geographical scale. Further genetic analyses with samples from areas not yet included are strongly recommended.

Population Trend

↓

Detailed Documentation

Range and Population

Anecdotal or opportunistic reports of the presence of bottlenose dolphins exist for most of the coastal waters of the Mediterranean basin. However, surprisingly little is known about their abundance, distribution and movements. Basin-wide surveys are lacking and reliable information comes only from local studies, e.g. in Israeli waters, the Tunisian plateau, portions of the Turkish and Greek seas, the northern Adriatic Sea, the Ligurian Sea, several small portions of the Italian, French and Spanish coasts, the Balearic Sea and the Alborán Sea. Little information exists for the eastern and southern portions of the basin, and virtually nothing is known for large portions of the south-eastern region.

Mediterranean bottlenose dolphins exhibit population structure based on toxicology and diet (Borrell *et al.* 2005) and genetics (Natoli *et al.* 2005). Comparison of 90 genetic samples indicated remarkable genetic differences among contiguous local populations from Gibraltar to the Black Sea. Four possible ecological boundaries have been proposed as follows: the Gibraltar strait, the Almerìa-Oran front, the Sicily Channel and the Turkish Straits system. Local subpopulations appear to be habitat-dependent, as biogeographic and hydrographic features influence their distribution and movement patterns (Natoli *et al.* 2005).

Absolute or relative abundance estimates are available for portions of the range (Table 1).

Table 1. Summary of abundance of bottlenose dolphins in the Mediterranean basin.

Geographic Area	Study area (km^2)	Sampled area	Years	Density (animals / km^2)	N	CV	95% CI	Estimation method	Source
Strait of Gibraltar	500	in- & off-shore	2005	0.51	258	0.08	226-316	Mark-recapture (closed population)	De Stephanis *et al.*, 2005
Alboran Sea (Spain)	11,821	in- & off-shore	2000-2003	0.049	584	0.28	278–744	Distance sampling & GAMs	Cañadas & Hammond, in press
Almeria (Spain)	4,232	in- & off-shore	2001-2003	0.066	279	0.28	146–461	Distance sampling & GAMs	Cañadas & Hammond, in press
Asinara island National Park (Italy)	480	inshore	2001	0.05	22	0.26	22–27	Mark-recapture (closed population)	Lauriano *et al.*, 2003
Balearic Islands & Catalonia (Spain)	86,000	in- & off-shore	2002	0.088	7,654	0.47	1,608-15,766	Distance sampling	Forcada *et al.*, 2004
Balearic Islands (Spain)	16,659	inshore	2002	0.085	1,030	0.35	415-1,849	Distance sampling	Forcada *et al.*, 2004
Alboran sea and Murcia	17,987	in- & off-shore	2004-2005	0.072	1288	-	-	Distance sampling & GAMs	Cañadas, unpublished
Gulf of Vera (Spain)	6,164	in- & off-shore	2003-2005	0.042	256	0.31	188–592	Distance sampling & GAMs	Cañadas, unpublished
Valencia (Spain)	32,270	in- & off-shore	2001-2003	0.041	1,333	0.31	739-2,407	Distance sampling	Gomez de Segura *et al.*, in press
Tunisian waters	~ 750	inshore	2001 & 2003	0.19	-	-	-	Distance sampling (uncorrected)	Ben Naceur *et al.*, 2004
Lampedusa island (Italy)	200	inshore	1996-2000	-	140				

Israeli Mediterranean coast (Israel)	-	inshore	1999-2004	- 85					-
Ionian Sea (Greece)	480	inshore	1993-2003	-	48				
Amvrakikos Gulf (Greece)	400	inshore	2001-2005	0.38	152	-	136-186		
Central Adriatic Sea (Kornati & Murtar Sea, Croatia)	300	inshore	2002	-	14				
North-eastern Adriatic Sea (Kvarneric, Croatia)	800	inshore	1990-2004	-	120				
North-eastern Adriatic Sea (Kvarneric, Croatia)	1,000	inshore	1997	113					0.06
North-eastern Adriatic Sea (Kvarneric, Croatia)	2,000	inshore	2003	102					0.05
North Adriatic Sea (Gulf of Trieste, Slovenia)	600	inshore	2002-2004	0.08	47				

Information on status and trends of the subpopulation is fragmentary because of the evident substructure and the diversity of the monitoring efforts and the fisheries with dolphin bycatch. The only Mediterranean area with quantitative historical information that can be used for direct calculation of trend and present status is the northern Adriatic Sea. There, bottlenose dolphin numbers likely declined by at least 50% over the past 50 years, largely as a consequence of historical killing, followed by habitat degradation and overfishing (Bearzi *et al*. 2004). For other parts of the northern Mediterranean, e.g. Spain, Italy and southern France, the available information on removals and trends in abundance is less precise and clear but suggests similar trends (Silvani *et al*. 1992; reports by workshop participants). A decline in abundance of about 39% was observed in a limited area of the north-eastern Adriatic between 1995 and 2003 (Fortuna submitted). The nature and extent of by-catch and other threats vary with region, but the overall pattern leads to the suspicion that the basin population has been reduced by at least 30% over the last 60 years. In recent years, as suggested by sightings and strandings, gaps have appeared in a formerly continuous distribution along the Mediterranean coast of Spain, indicating a reduction in the area of occupancy (reported by workshop participants).

Habitat and Ecology

Bottlenose dolphins in the Mediterranean are commonly regarded as coastal/inshore animals (Notarbartolo di Sciara and Demma 1997; Gannier 2005). However, they are regularly found in deep waters near the continental slope in the Alborán and Balearic seas (Forcada *et al.* 2004; Cañadas and Hammond in press) and in continental-shelf offshore waters of the Adriatic Sea and Tunisian plateau (Bearzi *et al*. 2004; Ben Naceur *et al.* 2004).

The mean size of bottlenose dolphin groups varies according to location, from typically small numbers in coastal waters (Bearzi *et al.* 1997; Ben Naceur *et al.* 2004) to larger numbers in pelagic waters (Forcada *et al.* 2004; Cañadas and Hammond in press). Coastal bottlenose dolphin groups average 7 individuals, whereas the mean size of offshore groups is about 35. Association with other cetacean species is uncommon, except in the Alborán Sea (Cañadas *et al*. 2002).

Mediterranean bottlenose dolphins are catholic feeders with a preference for demersal prey (Blanco *et al*. 2001). In coastal waters they can spend up to 5% of their time following trawlers (Bearzi *et al*. 1999). They also sometimes forage around fish-farm cages or take fish from gillnets (Lauriano *et al*. 2004; Diaz *et al*. 2006).

Threats

Owing to their occurrence in coastal waters, bottlenose dolphins are regularly exposed to a wide variety of human activities. Those in the Mediterranean were subjected to hunting until the 1960s (Bearzi *et al*. 2004). The main threats in recent times include: **1)** reduced availability of prey caused by overfishing and environmental degradation; **2)** incidental mortality in fishing gear; and **3)** toxic effects of xenobiotic

chemicals.

1) Excessive fishing pressure is a growing concern worldwide and is having profound direct and indirect impacts on Mediterranean ecosystems (Sala 2004). In the Mediterranean there is an acute lack of historical data and fisheries statistics are generally incomplete and unreliable (Briand 2000, 2003). Nonetheless, it is acknowledged that unsustainable fishing has led to dramatic ecological changes and caused the decline of many fish stocks, including key bottlenose dolphin prey (Caddy 1997; FAO 1997, 2000). Nutritional stress may be a factor in the low density of bottlenose dolphins in several Mediterranean areas (Bearzi *et al*. 1999, 2005b, 2006). Conversely, density is high where prey is abundant (*e.g.* in the Amvrakikòs Gulf, Greece, where dolphin density is an order of magnitude higher than in the overfished waters of the nearby island of Kalamos; Bearzi *et al*. 2005a, 2006).

2) Incidental mortality in fishing gear – particularly trammel and set gillnets, but also drift gillnets – is a frequent occurrence, and in some Mediterranean areas the rates have almost certainly been unsustainable (e.g. Silvani *et al*. 1992). Bycatch in trawl nets appears to be relatively uncommon in most Mediterranean areas. However, high mortality in bottom trawls has been reported from the coast of Israel (Goffman *et al.* 1995). Dolphins also die incidentally in purse seines and longlines (Bearzi 2002), but the relative importance of mortality from these gear types on *Tursiops* at the basin level is probably low. Interference with coastal fisheries ("depredation") can result in animals being shot, harpooned or harassed (Bearzi 2002; Gazo *et al.* 2004) although such retaliation probably occurs less frequently now than in the past when dolphins were regarded as vermin and systematically persecuted (Bearzi *et al.* 2004). Intentional killing may still be a serious problem in areas where acute conflict exists. However, depredation or damage to fishing gear by the dolphins does not necessarily always lead to open hostility towards them. Attitudes towards dolphins along the Mediterranean coasts vary greatly according to cultural, religious or other factors (e.g. see Bearzi 2005).

3) Contaminant levels, particularly of organochlorine compounds, in Mediterranean bottlenose dolphins are very high compared to levels reported from other areas (Corsolini *et al*. 1995; Aguilar *et al*. 2002; Fossi and Marsili 2003) and are a concern due to their potential effects on reproduction and health (Fossi and Marsili 2003). At concentrations similar to or lower than those detected in Mediterranean animals, compounds such as PCBs have been associated with reproductive disorders and immune-system suppression in bottlenose dolphins from other populations (Lahvis *et al*. 1995; Schwacke *et al*. 2002; Hall *et al*. 2005). Although organochlorine contamination is decreasing in some areas (Tolosa *et al*. 1997), levels in Mediterranean cetaceans remain exceptionally high (Aguilar and Borrell 2004).

In addition to the main threats listed above, mass mortality (die-offs), direct disturbance from boating activities, and noise represent potential threats at local scales. Die-offs appear to have affected bottlenose dolphins to a lesser extent than other Mediterranean species such as the striped dolphin (Aguilar and Raga 1993). However, bottlenose dolphins elsewhere have experienced mass mortality (Lipscomb *et al*. 1994; Duignan *et al*. 1996; Birkun *et al*. 1998). As mass mortality may be partly related to the animals' weakened immune systems induced by exposure to xenobiotics or by stress from poor nutrition (Aguilar and Borrell 1994; Calzada *et al*. 1996; O'Shea and Aguilar 2001), the risk to bottlenose dolphins in the Mediterranean is considered high. Direct disturbance by recreational boating is another potential threat (Lusseau 2003; Constantine *et al*. 2004) that has been poorly investigated in the Mediterranean. The number of recreational boats was correlated with avoidance of certain areas by dolphins in the north-eastern Adriatic during the summer (Fortuna submitted).

Conservation measures

National protection status

National protection status varies according to country. Bottlenose dolphins are legally protected as a species in some countries and as "cetaceans" or "marine mammals" in others. In some States, bottlenose dolphins are not given specific protection as a species or by virtue of their inclusion within an order or class of animals, but they may gain some protection through broad legislation that applies to the marine environment or nature in general.

Various kinds of marine protected areas exist or have been proposed throughout the Mediterranean. Although not always specifically intended for bottlenose dolphins, the following measures, once implemented, could contribute to their conservation:

- Pelagos Sanctuary, a 90,000 km^2 cetacean sanctuary in the Corsican-Ligurian Basin, created in

1999 by Italy, France and the Monaco Principality. Twenty-two other MPAs of variable size have been established in Italy, and 29 more are planned. If appropriately managed and coordinated, this network of MPAs may contribute to bottlenose dolphin conservation.
• In 1999, the Spanish Ministry for the Environment classified the bottlenose dolphin in its National Endangered Species Act as "vulnerable" in the Mediterranean. The following year, a programme was initiated to identify and promote cetacean-oriented MPAs in the Spanish Mediterranean. A EU-funded LIFE project (2002-2005) has developed the management schemes for cetacean conservation.
• In Croatia, a Dolphin Reserve around the islands of Cres and Losinj (north-eastern Adriatic Sea) was proposed in 1993. In 2002, an updated version proposing to designate the area as a Special Zoological Reserve was submitted to the Croatian Ministry of the Environment and Physical Planning. In 2005, a new phase began for approval, adoption and implementation of the proposal.
• The eastern Ionian area around the island of Kalamos, where bottlenose dolphins reside, was included by Greece in the Natura 2000 network ("Sites of Community Importance") under the 9243 EEC "Habitats" Directive. The area has been identified by ACCOBAMS (2002) as one where pilot conservation and management actions should be implemented immediately to preserve cetacean habitat. So far, no specific conservation actions have been taken.
• In the waters around Ischia, south-eastern Tyrrhenian Sea, the creation of a marine reserve dedicated to cetaceans was proposed recently by Italy, which, if finalised, may lead to mitigation of obvious threats such as boat disturbance and illegal fishing.
• Algeria has presented a proposal to include the Cap de Garde Marine Reserve and the Bancs des Kabyles (Jijel) Marine Reserve in the list of Specially Protected Areas of Mediterranean Interest (SPAMI). Both of these protected areas may include important habitat for bottlenose dolphins.

While these types of designations, and others not listed here, may benefit bottlenose dolphins at least indirectly, measures likely to provide direct benefits remain to be identified and implemented (e.g. area-, season-, or fishery-specific reductions in fishing effort; curtailment of inputs of particular pollutants).

International protection status

Action to protect Mediterranean cetaceans is surprisingly scant, if one considers the large number of existing legislative instruments. Although these provide an important framework for the conservation of bottlenose dolphins and the protection of their habitat, enforcement remains rare. These instruments include:

A) CMS and ACCOBAMS.
In the CMS, the Mediterranean bottlenose dolphin population is listed in Appendix II.
Under ACCOBAMS the species is listed in Appendix II and fully protected.

B) Wildlife treaties.

1) The Protocol of the Barcelona Convention concerning Specially Protected Areas and Biological Diversity in the Mediterranean, where the species is listed in Annex II (endangered or threatened species).
2) The Convention on the Conservation of European Wildlife and Natural Habitats, or "Bern Convention", where the species is registered in Appendix II (strictly protected fauna species).
3) The Agreement for the creation of a sanctuary for marine mammals in the Mediterranean Sea (Pelagos Sanctuary, 1999).
4) CITES, where the species is included in Annex II.
5) The EC regulation lists the species in its Appendix A, which prohibits trade for primarily commercial purposes.

C) International treaties pertinent for the conservation of Mediterranean bottlenose dolphins and/or their habitats, including:
1) The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (the Barcelona Convention) and its protocols;
2) The FAO Code of Conduct for Responsible Fisheries;
3) The "United Nations Straddling Stocks Agreement";
4) The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas;

5) The Agreement for the Establishment of the General Fisheries Commission for the Mediterranean (GFCM).

D) Two European Community instruments that are binding for EU Member States are worth mentioning here due to their relevance to bottlenose dolphin conservation: Council Regulation (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy, and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, or "Habitats Directive" whose annex IV protects all cetacean species.

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Common bottlenose dolphin (*Tursiops truncatus ponticus*) Black Sea subspecies

Taxonomy

Family

Delphinidae Gray, 1821

Genus

Tursiops Gervais, 1855

Species

Tursiops truncatus (Montagu, 1821)

Subspecies

Tursiops truncatus ponticus Barabasch, 1940

Relevant Common Names

EN	[Black Sea] bottlenose dolphin, common bottlenose dolphin
BG	afala, puchtun
KA	afalina
RO	afalin, delfinul cu bot de sticla, delfinul cu bot gros
RU	[chernomorskaya] afalina, butylkonosyi del'fin ([черноморская] афалина, бутылконосый дельфин)
TR	afalina
UK	[chornomors'ka] afalina ([чорноморська] афаліна)

Assessment Information

Endangered (EN A2c,d,e)

Year Assessed

2006

Assessor(s)

Alexei Birkun, Jr.

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

Justification

The Black Sea bottlenose dolphin, *T. t. ponticus*, qualifies for listing as Endangered based on criterion A2c,d,e.

Generation time was not estimated for this subspecies; it was assumed to be approximately 20 years, as for the Mediterranean bottlenose dolphin (see main text of this workshop report). Thus, 3 generations for Black Sea bottlenose dolphins would be about 60 years.

There is no estimate of total population size but information from incomplete surveys suggests that the current population size is not less than several 1000s of animals.

The past 60-year period (1946-2005; three generations) includes events, circumstances and trends that are relevant to Criterion A, as follows:

(1) Large directed takes occurred before the ban on small cetacean hunting was declared in Turkey in 1983. Within the 38-year period from 1946-1983, the total number of bottlenose dolphins killed was at least 24,000-28,000 but certainly much greater (probably by tens of 1000s) because those figures do not incorporate any catch statistics from Romania, or for Turkey before 1976 and after 1981, or for Bulgaria before 1958 (see "Threats"). There are indications of some recent intentional killing and harassment in Ukraine;

(2) Regionally dispersed incidental mortality in bottom-set gillnets from 1946 through the 1980s is roughly estimated at some 100s per year. The scale of this mortality almost certainly increased in the 1990s-2000s owing to the rapid expansion of illegal, unreported and unregulated fishing in the Black Sea;

(3) Live-capture of bottlenose dolphins for captivity, including the attendant mortality during capture operations, is roughly estimated at 1,000-2,000, all told, since the early 1960s. Live-captures continue in the Russian Federation, with 10-20 animals taken annually from a small area;

(4) A mass stranding/mortality event of unknown cause occurred in 1990, believed to have involved at least 100s of bottlenose dolphins;

(5) There has been ongoing degradation of the Black Sea environment overall (including bottlenose dolphin habitat) and declines in many of its indigenous animal populations (including bottlenose dolphin prey) from the 1970s to the present, with a likely peak in the devastation caused by overfishing and habitat deterioration (including pollution and explosive growth of populations of invasive species) in the late 1980s–early 1990s. These processes, taken together, have led to severe declines in prey populations.

The inference of a reduction in population size of 50% was supported by a simple simulation in which the population was assumed to increase at a constant rate of 4% per year and the direct and incidental removals (as indicated by paragraphs (1), (2) and (3) above) were estimated realistically. This simulation showed that a decline of more than 50% in the last three generations would be required for the current population size to be about 15,000 bottlenose dolphins.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Bulgaria	X						
Georgia	X						
Romania	X						
Russia	X						
Turkey	X						
Ukraine	X						

Range of the Black Sea bottlenose dolphin (*T. t. ponticus* Barabasch, 1940). Red dots (direct observations) and query mark (eyewitness's testimony) indicate locations of strandings on the Azov Sea coast.

Summary Documentation

Biome

Marine. Black Sea bottlenose dolphins occur occasionally in estuarine and fluvial environments.

Major Habitat(s)

Circumlittoral area over the continental shelf (usually more than 6 m but less than 200 m deep)
Open sea
Shallow sea (usually less than 6 m deep; includes sea bays and straits)

A few instances of Black Sea bottlenose dolphins visiting big rivers are known. Sightings in some estuaries and coastal saline lagoons are not rare.

Taxonomy

Bottlenose dolphins in the Black Sea are recognized as a subspecies possessing morphological differences from Atlantic and Pacific populations (Barabasch-Nikiforov 1960; Geptner *et al.* 1976). The Black Sea population is also differentiated genetically from other bottlenose dolphin populations in the eastern and western Mediterranean and the northeastern Atlantic (Natoli *et al.* 2005), and this evidence supports recognition of *T. t. ponticus* (Ada Natoli, 2006, pers. comm.).

Geographic Range

(a) The entire Black Sea area, including territorial waters and exclusive economic zones of Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine; (b) internal waters of Ukraine in the Black Sea, including the Dnieper-and-Boug Liman (firth) and Karkinitsky Bay; (c) internal waters of Russia and Ukraine, represented by the Kerch Strait along with the southern Azov Sea; (d) internal waters of Turkey, represented by the Turkish Straits System (TSS) including the Bosphorus Strait, Marmara Sea and Dardanelles Straits; (e) lagoons, estuaries and rivers located on the northwestern coast of the Black Sea in Ukraine and Romania.

Population

The total population size is unknown. However, there are recent abundance estimates for parts of the range, including the TSS, Kerch Strait, and Russian and Ukrainian territorial waters in the Black Sea (see Table 1). These estimates suggest that population size is at least several 1000s. Population structure within the Black Sea is likely, with several subpopulations ("semi-resident" communities), including those that spend most of the year in geographically and ecologically different areas, *e.g.* northwestern Black Sea; coastal waters off southern Crimea; Kerch Strait and adjoining portions of the Black Sea and Azov Sea; shelf waters off the Caucasian coast; Turkish Black Sea; and TSS.

Population Trend

↓ – until 1983 (directed killing reduced the population)
↑ ? – 1983–2005
↓ ? – 2006 and beyond

Detailed Documentation

Range and Population

Range: The range of Black Sea bottlenose dolphins includes the Black Sea proper; Kerch Strait along with the adjoining part of the Azov Sea (Tzalkin 1940; Birkun *et al.* 1997; Sokolov 1997); and the Turkish Straits System (TSS) (Kleinenberg 1956; Beaubrun 1995; Öztürk and Öztürk 1997). The genetic data suggest that the TSS constitutes an ecological barrier between the Black Sea dolphins and those in the Mediterranean, although limited gene flow between the two seas is probable. A possible vagrant from the Black Sea population was identified genetically in the western Mediterranean (Natoli *et al.* 2005).

The range of the Black Sea subspecies includes the territorial waters and exclusive economic zones of Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine in the Black Sea; internal waters of Ukraine in the Black Sea (including the Dnieper-and-Boug Liman, Karkinitsky Bay and Donuzlav Lake); internal waters of Russia and Ukraine in the Kerch Strait and Azov Sea; and internal waters of Turkey including the Bosphorus Strait, Marmara Sea and Dardanelles. There are a few records of bottlenose dolphins entering rivers, *e.g.* the Danube in Romania (Police 1930, *fide* Tomilin 1957) and the Dnieper in Ukraine (Birkun 2006).

Population structure within the Black Sea is likely (Bel'kovich 1996), with several subpopulations or "semi-resident" communities, including those that spend most of the year in geographically and ecologically different areas, *e.g.* northwestern Black Sea; coastal waters off the southern Crimea; Kerch Strait and adjoining portions of the Black Sea and Azov Sea; shelf waters off the Caucasian coast; Turkish Black Sea; and TSS.

Abundance: The total population size is unknown. Region-wide estimates of absolute abundance, based on strip transect surveys carried out in the USSR (1967-1974) and Turkey (1987), have been discredited by the IWC Scientific Committee due to irremediable methodological and interpretive problems (Smith 1982; Buckland *et al.* 1992). During most of the 20th century, the bottlenose dolphin was considered the least abundant of the three cetacean species in the Black Sea (Zalkin 1940; Kleinenberg 1956; Geptner *et al.* 1976; Yaskin and Yukhov 1997). During the last decade, bottlenose dolphins have become prevalent in coastal waters of the northern Black Sea (Birkun *et al.* 2004b). The estimated sighting rate increased by a factor of five between 1995 and 1997-1998. There is an annual autumn accumulation of bottlenose dolphins in waters close to the southern extremity of the Crimea (Cape Fiolent – Cape Sarych). Groups of hundreds of animals migrate every autumn to this relatively small area from the eastern and, probably, other parts of the Black Sea (Birkun *et al.* 2004b; Birkun 2006). Estimates of abundance from recent line transect surveys in different parts of the range (Table 1) suggest that present population size is not less than several 1000s.

Table 1 – Bottlenose dolphin abundance estimates in the selected Black Sea areas

Surveyed area and observation effort	Observation platform	Research period	Uncorrected abundance estimates	References
Turkish Straits System (Bosphorus, Marmara Sea and Dardanelles)	Vessel	October 1997	495 (203–1,197; 95% CI)	Dede (1999), cited after: IWC (2004)
Turkish Straits System (Bosphorus, Marmara Sea and Dardanelles)	Vessel	August 1998	468 (184–1,186; 95% CI)	Dede (1999), cited after: IWC (2004)
Kerch Strait, 890 km²/353 km	Aircraft	July 2001	76 (30–192; 95% CI)	Birkun *et al*. (2002)
Kerch Strait, 890 km²/353 km	Aircraft	August 2002	88 (31–243; 95% CI)	Birkun *et al*. (2003)
Kerch Strait, 862 km²/310 km	Vessel	August 2003	127 (67–238; 95% CI)	Birkun *et al*. (2004a)
NE shelf area of the Black Sea, 7,960 km²/791 km	Aircraft	August 2002	823 (329–2,057; 95% CI)	Birkun *et al*. (2003)
NW, N and NE Black Sea within Ukrainian and Russian territorial waters, 31,780 km²/2,230 km	Vessel	September-October 2003	4,193 (2,527–6,956; 95% CI)	Birkun *et al*. (2004a)
SE Black Sea within Georgian waters, 2,320 km²/211 km	Vessel	January 2005	0	Birkun *et al*. (2006)
SE Black Sea within Georgian waters, 2,320 km²/211 km	Vessel	May 2005	0	Komakhidze and Goradze (2005)
SE Black Sea within Georgian waters, 2,320 km²/211 km	Vessel	August 2005	0	Komakhidze and Goradze (2005)
SE Black Sea within Georgian waters, 2,320 km²/211 km	Vessel	November 2005	0	Irakli Goradze, 2006, pers. comm.
Central Black Sea beyond territorial waters of Ukraine and Turkey, 31,200km²/660 km	Vessel	September-October 2005	0	Krivokhizhin *et al*. (2006)

Population Trend: In the 20th century, the number of Black Sea bottlenose dolphins was reduced by direct killing for the cetacean-processing industry, which continued until 1983. The numbers of animals taken were not recorded accurately; much of the catch data was recorded as numbers of animals undifferentiated to species (all three Black Sea cetacean species were targeted) and by wet weight aggregates (*e.g.* tons of small cetaceans landed). Nevertheless, it can be inferred that the population size of *T. t. ponticus* had been reduced by many thousands as a result of these direct kills by the time of the total ban on the Black Sea dolphin fishery (see "Threats" section). It is suspected that during the period from 1983-2005, the population had a tendency to increase. However, it is also suspected that recovery has been compromised by a mass mortality event and by the persistent and probably increasing anthropogenic influences listed below under "Threats".

Generation Time: It was assumed that Black Sea bottlenose dolphins have a similar life history to *T. truncatus* elsewhere and therefore that the generation time is approximately 20 years. The interval between births is from two or three to six years (Tomilin 1957), but in captive females the reproductive cycle can be as short as two years (Ozharovskaya 1997). It was assumed that one female is unlikely to produce more than eight calves in her lifetime (Tomilin 1984, cited after: Ozharovskaya 1997). Sexual behaviour can be observed during the whole year with a peak in spring and early summer. The reproductive season (maximum five spontaneous ovulations) extends from March to October with a peak in June; the highest concentrations of testosterone in males were recorded in July and the lowest in January (Ozharovskaya 1997). Gestation lasts 12 months. Lactation can last from 4 months to more than 1.5 years.

Habitat and Ecology

Bottlenose dolphins are distributed across the Black Sea shelf; they sometimes occur far offshore (Beaubrun 1995; Yaskin and Yukhov 1997). In the northern Black Sea they form scattered communities of some tens to approximately 150 animals in different places around Crimea, including the Kerch Strait and coastal waters off the western and southern extremities of the peninsula (Zatevakhin and Bel'kovich 1996; Birkun *et al*. 2004a; Birkun 2006). Accumulations also are known to form off the Russian Caucasus (Olga Shpak, 2005, pers. comm.) and close to the Turkish coast (Sergey Krivokhizhin, 2005, pers. comm.). Bottlenose dolphins typically aggregate during autumn, winter and spring in a relatively small

area off southern Crimea between Cape Sarych and Cape Khersones (Birkun *et al*. 2006). According to a 2-year photo-identification study, this "winter" accumulation consists of animals from other "summer" concentrations. Mean group sizes varied from 2.0 to 2.9 in different surveyed areas (Birkun *et al*. 2002, 2003, 2004a).

The peculiarities of cetacean ecology in the Black Sea are conditioned mainly by the high degree of geographical isolation of the sea, its relatively low salinity, significant seasonal fluctuations of water temperature, and the presence of anoxic water saturated with hydrogen sulphide below 100-250 m depth. Bottlenose dolphins are primarily piscivorous in the Black Sea, taking both benthic and pelagic fishes, large and small. A total of 16 fish species have been reported as prey off the Crimean and Caucasian coasts (Tzalkin 1940; Kleinenberg 1956; Tomilin 1957; Krivokhizhin *et al*. 2000) including four species of mullet (*Lisa aurata*, *L. saliens*, *Mugil cephalus* and *M. so-iuy*).

Threats

In the past, the population was subject to extensive commercial killing. Bottlenose dolphins were taken by all Black Sea countries for manufacturing oils, paint, glue, varnish, foodstuffs, medicine, soap, cosmetics, leather, "fish" meal and bone fertilizer (Kleinenberg 1956; Tomilin 1957; Buckland *et al*. 1992). The total number of animals killed is unknown; however, it is generally acknowledged that all Black Sea cetacean populations, including bottlenose dolphins, were greatly reduced by the dolphin fishery (IWC 1983, 1992, 2004). It has been roughly estimated that between the early 1930s and mid 1950s bottlenose dolphins constituted only 0.5% of the aggregate numbers of Black Sea cetaceans killed and processed in the USSR (Tzalkin 1940; Kleinenberg 1956) including present-day Russia, Ukraine and Georgia. The statistics of the fishery were commonly expressed as total weight or total numbers of animals in the catch without species differentiation. Using the value of 0.5%, Zemsky (1996) estimated that a total of only 4,279 bottlenose dolphins were taken in the USSR (1946-1966) and Bulgaria (1958-1966), with yearly variation from 30 (in 1966) to 656 (in 1959). These figures are very likely underestimated to a great extent for the following reasons: (a) in spring 1946, more than 3,000 bottlenose dolphins were caught during a single day in one location close to the southern Crimea (Kleinenberg 1956); (b) in 1961, the Bulgarian cetacean fishery concentrated almost exclusively on bottlenose dolphins and about 13,000 of them were taken (Nikolov 1963 *fide* Sal'nikov 1967); (c) in April 1966, a single dolphin-processing factory in Novorossiysk, Russia, processed 53 bottlenose dolphins (Danilevsky and Tyutyunnikov 1968).

Thus, taking into consideration the unknown but presumably significant size of the Turkish and Romanian catches, it can be inferred that the number of bottlenose dolphins killed before the mid 1960s was sometimes very high. From 1976 to 1981, bottlenose dolphins were believed to account for 2-3% of the total catch in the Turkish cetacean fishery, which took an estimated 34,000-44,000 small cetaceans annually (IWC 1983; Klinowska 1991). This would imply 680-1,320 bottlenose dolphins per year, or 4,080-7,920 for the six years all told. No reliable information is available on illegal commercial killing of Black Sea bottlenose dolphins since the ban on cetacean fisheries in 1983. Isolated cases of deliberate killing and harassment (with pyrotechnic devices and firearms) have been reported in coastal fisheries. For instance, at least two bottlenose dolphins were reportedly shot in Balaklava, Ukraine (Sergey Popov, 2004, pers. comm.).

Since the mid 1960s, hundreds of bottlenose dolphins (probably > 1000) have been live-captured in the former USSR, Russia, Ukraine and Romania for military, commercial and scientific purposes (Birkun 2002a). The capture operations sometimes caused accidental (but usually unreported) deaths. In recent years, 10-20 animals have been taken annually in May–June from a small area in the Kerch Strait, Russia. During the 1980s–early 2000s the number of facilities for dolphin shows and "swim with dolphins" programmes greatly increased in Black Sea countries. The export of bottlenose dolphins from Russia and Ukraine for permanent and seasonal shows also expanded, for example, to Argentina, Bahrain, Byelorus, Chile, Cyprus, Egypt, Hungary, Iran, Israel, Kuwait, Lithuania, Romania, Saudi Arabia, Syria, Turkey, United Arab Emirates, Vietnam, and former Yugoslavia countries. A few captive animals were exported from Georgia to Yugoslavia and then re-exported to Malta. According to CITES statistics, at least 92 individuals were removed from the Black Sea region during 1990-1999 (Reeves *et al*. 2003) and Russia reportedly has exported at least 66 for traveling shows since 1997 (Fisher and Reeves 2005).

At present, incidental mortality in fishing gear is probably one of the main threats to *T. t. ponticus*, although these animals have never been the predominant species in national cetacean bycatch statistics. They constituted no more than 3% of the totals in the reports from Black Sea countries during the 1990s (Birkun 2002b). At least 200-300 bottlenose dolphins were estimated as being taken incidentally in Turkish

fisheries each year (Öztürk 1999). They are known to be susceptible to capture in a variety of fishing nets, including bottom-set gillnets for turbot (*Psetta maeotica*), spiny dogfish (*Squalus acanthias*), sturgeon (*Acipenser* spp.) and sole (*Solea* spp.), purse seines for mullet (*Mugil* spp. and *Lisa* spp.) and anchovy (*Engraulis encrasicolus ponticus*), trammel nets and trap nets. However, only bottom-set gillnets are thought to take significant numbers, especially during the turbot fishing season between April and June.

Small-scale coastal fisheries also affect Black Sea bottenose dolphins indirectly by depleting their prey populations.
Declining trends have been observed in the abundance of indigenous mullets (*M. cephalus* and *Lisa* spp.) (Zaitsev and Mamaev 1997). At the same time, the effects of a suspected decrease in cetacean forage resources (Bushuyev 2000) might be offset at least to some extent by the introduced far-east mullet, *M. so-iuy*, which has become abundant in the northern Black Sea since the 1990s (Zaitsev and Mamaev 1997). In fact, it may be responsible for the relocation of bottlenose dolphin groups and the recent marked increases in density along the Crimean coast (see “Abundance”).

According to annual compilations of cetacean stranding records in Crimea (Krivokhizhin and Birkun 1999), there was a prominent peak in *T. t. ponticus* strandings in 1990 (20 dead animals, representing 44% of all bottlenose dolphin strandings reported from 1989-1996). The primary cause and magnitude of that spike in bottlenose dolphin mortality remains unclear, although severe purulent pneumonia was revealed in many cases. The multi-microbial pollution from untreated sewage in coastal waters poses a chronic risk of opportunistic bacterial infections to bottlenose dolphins, and there is evidence that they (as well as other Black Sea cetaceans) are exposed to morbillivirus infection (Birkun 2002c). Another ongoing problem (as a potential source of exotic infections and genetic “pollution”) is the poorly managed intentional releases and spontaneous escapes of captive bottlenose dolphins and other marine mammals from dolphinaria or oceanaria (e.g. Veit *et al.* 1997; ACCOBAMS/SC 2005).

Conservation measures

The species *T. truncatus* is listed as Data Deficient by IUCN, although the Black Sea population is highlighted as a concern in the IUCN/SSC/CSG 2002-2010 Conservation Action Plan (Reeves *et al.* 2003).

Commercial hunting of Black Sea cetaceans including bottlenose dolphins was banned in 1966 in the former USSR, Bulgaria and Romania, and in 1983 in Turkey. The riparian states assumed international obligations to protect Black Sea cetaceans as contracting parties to the Convention on Biological Diversity (CBD), Convention on the Conservation of Migratory Species of Wild Animals (CMS), Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention), Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, Appendix II), and the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). The 1st Session of the Meeting of the Parties to ACCOBAMS (2002) adopted a resolution to strengthen measures for restricting the deliberate catching, keeping and trade of Black Sea bottlenose dolphins. At the 12th Conference of the Parties to CITES (2002), a quota of zero was established for commercial export of live dolphins wild-captured in the Black Sea. In 2003 the IWC Scientific Committee’s Sub-Committee on Small Cetaceans reviewed the status of Black Sea bottlenose dolphins and concluded that this population should be managed for conservation as a distinct entity (IWC 2004).

The bottlenose dolphin is included in Annex II of the EC Directive No.92/43/EEC on the conservation of natural habitats of wild fauna and flora. In 1996 the Ministers of Environment of Black Sea countries adopted cetacean conservation and research measures in the framework of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (paragraph 62). The bottlenose dolphin is included as Data Deficient in the regional Black Sea Red Data Book (1999). However, in 2002 it was listed as Endangered in the Provisional List of Species of Black Sea Importance, an annex to the Black Sea Biodiversity and Landscape Conservation Protocol of the Bucharest Convention. The regional Conservation Plan for Cetaceans in the Black Sea has been drafted in accordance with the ACCOBAMS International Implementation Priorities for 2002-2006 (Notarbartolo di Sciara 2002).

On a national level, Black Sea cetaceans, including bottlenose dolphins, are protected by environmental laws, governmental decrees and national Red Data Books. The bottlenose dolphin is listed in the Red Data Books of Bulgaria, Georgia, Russia and Ukraine (which do not use the IUCN categories and criteria). In Russia and Ukraine, Red Book inscription means that a species should be monitored and managed by appropriate state/national programmes. Such a programme has existed in Ukraine since

1999 (the Delfin-programme adopted by the Ministry of Environment). Action Plans for the conservation of Black Sea cetaceans were produced in Ukraine (2001) and Romania (2003) but they have no legal effect. The ACCOBAMS Implementation Priorities for 2002-2006 (Notarbartolo di Sciara 2002) envisage the development of a pilot conservation and management project to benefit bottlenose dolphins and harbour porpoises in the well-defined area between Cape Sarych and Cape Khersones, southern Crimea (Ukraine).

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Cuvier's beaked whale (*Ziphius cavirostris*) Mediterranean subpopulation

Taxonomy

Family

Ziphiidae

Relevant Common Names

EN	Cuvier's beaked whale
FR	baleine de Cuvier, ziphius
ES	zifio de Cuvier
SQ	balene me sqep
AR	زيفيوس (zifius)
HR	Cuvierov kit
EL	ζιφιός (zifiós)
HE	זיפיוס חלול-חרטום (zifyus chalul chartom)
IT	zifio
ML	baliena ta' Kuvjer
PT	zifio
TR	Kuvier balinasi

Assessment Information

Data Deficient (DD)

Year Assessed

2006

Assessor(s)

Ana Cañadas

Evaluator(s)

IUCN/ACCOBAMS Workshop on the Red List Assessment of Cetaceans in the ACCOBAMS Area (Monaco, 5-7 March 2006)

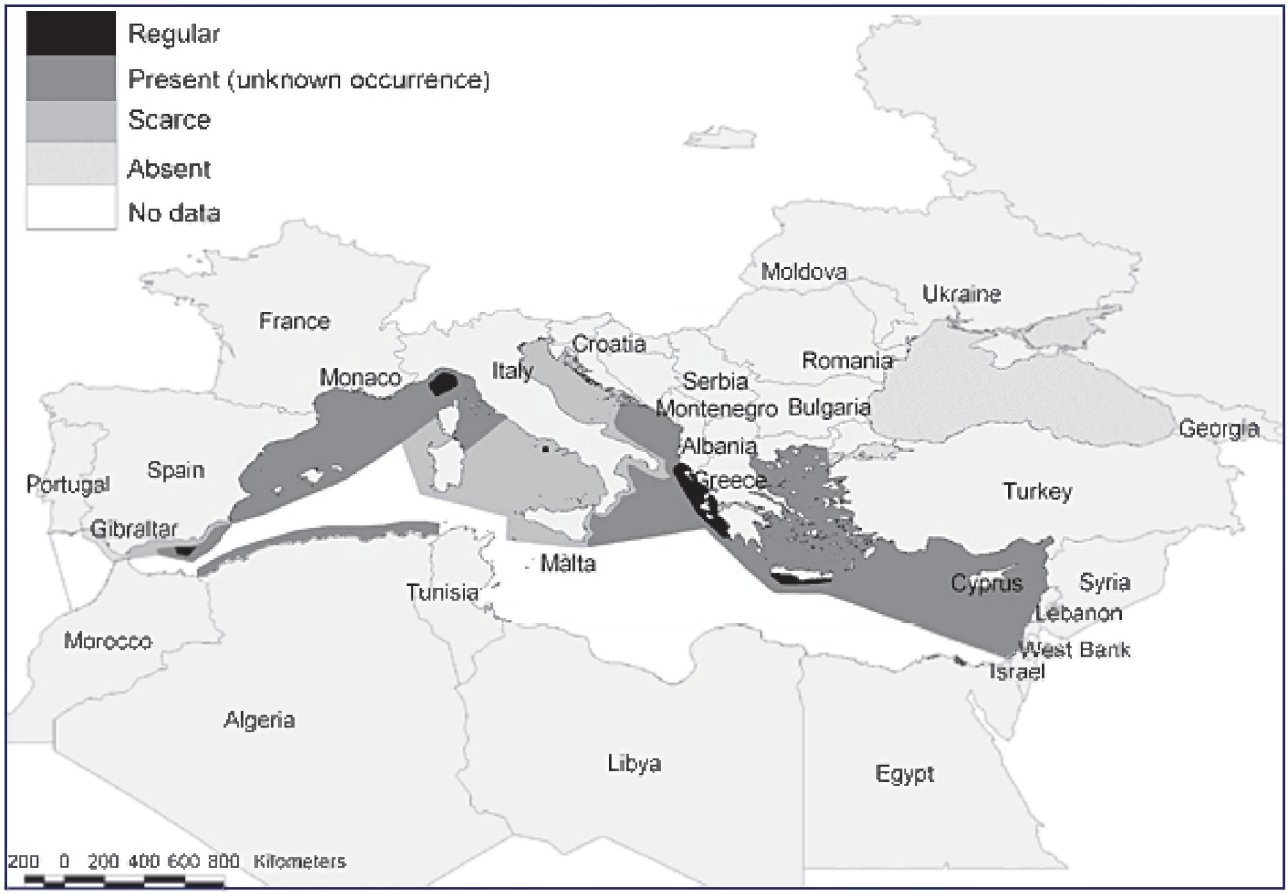
Justification

Appropriate data on distribution, population structure and abundance in the Mediterranean basin are lacking. Also, the species' biology is very poorly known. The status of Cuvier's beaked whale in the Mediterranean is therefore impossible to assess on available evidence.

Distribution

Country Names

Territorial waters of	Native - presence confirmed	Native – possibly present	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania	X						
Algeria	X						
Bosnia and Herzegovina		X					
Croatia	X						
Cyprus		X					
Egypt		X					
France	X						
Gibraltar (UK)	X						
Greece	X						
Israel	X						
Italy	X						
Lebanon		X					
Libya		X					
Malta		X					
Monaco	X						
Morocco		X					
Palestinian Territory		X					
Serbia and Montenegro		X					
Slovenia				X			
Spain	X						
Syria		X					
Tunisia		X					
Turkey	X						



Knowledge on the distribution of Cuvier's beaked whales in the Mediterranean and Black Seas.

Summary Documentation

Biome

Marine

Major Habitat(s)

Open sea

Geographic Range

Deep waters of the whole Mediterranean Sea (referring to surveyed areas; large portions of the southern Mediterranean unknown) (see 'Range and Population' below)

Population

Population size and structure unknown. Relatively common, at least in the Ligurian Sea, the eastern part of the Alborán Sea, the Hellenic Trench and the northwestern Aegean Sea, but even relative density is unknown for most areas.

Population Trend

?

Detailed Documentation

Range and Population

Cuvier's beaked whales inhabit both the western and eastern basins of the Mediterranean (Notarbartolo di Sciara 2002). Much of the current knowledge of this species in the Mediterranean has come from stranding data. Strandings have been reported in Albania, Algeria, Croatia, Egypt, France, Greece, Israel,

Italy, Malta, Spain and Turkey, totalling 316 animals (Podestà *et al*. 2006). Twenty-six percent of the total animals recorded stranded in the Mediterranean have been in mass strandings involving 3 or more animals (Podestà *et al*. 2006). Strandings have been particularly numerous along the Ligurian and Ionian coasts, but it is important not to infer too much about species distribution or relative abundance from strandings data alone. Strandings data are subject to a variety of types of bias.

Cuvier's beaked whales seem to be relatively abundant in the eastern Ligurian Sea and off southwestern Crete, especially over and around canyons (D'Amico *et al*. 2003; Frantzis *et al*. 2003; Ballardini *et al*. 2005; Scalise *et al*. 2005). They appear not to be very abundant in the western Ligurian Sea (only 41 sightings in 16 years; Tethys Research Institute, unpublished data). Cuvier's beaked whales have been described as regular inhabitants of the Hellenic Trench (Frantzis *et al*. 2003), the southern Adriatic Sea based on frequency of strandings (Holcer *et al*. 2003) and the eastern section of the Alborán Sea (Cañadas *et al*. 2005). They also occur in the central Tyrrhenian Sea (Marini *et al*. 1992) and in Spanish Mediterranean waters (Gannier 1999; Raga and Pantoja 2004). No information is available for the remaining areas of the Mediterranean.

There are no data on abundance or trend for this species in the Mediterranean.

There are areas, especially in the southern portions of the basin, where Cuvier's beaked whales have not been recorded from either strandings or sightings. However, it must be borne in mind that their long dive times, usually inconspicuous appearance at the surface and typical avoidance of vessels make them difficult to spot (Heyning 1989). In addition, sighting effort and the efficiency of stranding networks vary throughout the Mediterranean: many areas have little or no effort to make and record sightings or to detect strandings. Therefore, a comprehensive basin-wide survey and an efficient basin-wide stranding network are needed before reaching firm conclusions about presence and absence. It is nevertheless possible, based on available data, to identify at least some areas as good habitat, and probably hot-spots, for Cuvier's beaked whales, such as the eastern Ligurian Sea, the eastern Alborán Sea and the Hellenic Trench. The species is probably also common in several other unexplored areas.

The Mediterranean population is genetically distinct from neighbouring populations in the eastern North Atlantic and therefore it has been considered an evolutionarily significant unit (Dalebout *et al*. 2005). Furthermore, surveys conducted in the Strait of Gibraltar and the western section of the Alborán Sea since 1998 (22,649 km of effort all year-round) and 2000 (7,471 km of effort in summer), respectively (de Stephanis *et al*. 2005; Cañadas unpublished data), have not recorded a single sighting of this species, supporting the hypothesis of no or very little occurrence in or movement through the Strait. Thus, Cuvier's beaked whales in the Mediterranean are here considered a geographical subpopulation.

Habitat and Ecology

Cuvier's beaked whale is a predominantly oceanic species often associated with deep slope habitat and a marked preference for submarine canyons and escarpments (D'Amico *et al*. 2003; MacLeod 2005; Podestá *et al*. 2006). In the Alborán Sea, Cuvier's beaked whales are encountered in areas of >600 m depth and >40 m km^{-1} of slope, especially around the 1000 m isobath in an area of steep canyons off southern Almería, SE Spain (Cañadas *et al*. 2002; Cañadas *et al*. 2005). In the Hellenic Trench, Cuvier's beaked whales are sighted in areas of between 500 and 1500 m depth; it is not known if they are also present further offshore over the abyssal plain (Frantzis et al. 2003). They seem to be present over all steep depressions of the Aegean Plateau (Frantzis *et al*. 2003). In the eastern Ligurian Sea (Gulf of Genoa) they are especially abundant around canyons (D'Amico *et al*. 2003). In this area, Scalise *et al*. (2005) reported a mean depth at encounters of 1358 m (range=641-2545, se=514) and a mean slope of 77.1 m km^{-1} (range=3-256.5, se=57). In the same area, cruises organised by SACLANTCEN encountered Cuvier's beaked whales in waters 500-2600 m deep, with a peak encounter rate in waters 1000-1500 m deep over steep slopes (M. Carron, pers. comm.). In the western Ligurian Sea, most sightings have been in waters 1500-2300 m deep (S. Airoldi, pers. comm.).

Mean group size is fairly constant across the whole basin where data have been collected, ranging from 2.2 to 2.6 individuals (Cañadas *et al*. 2005, Ballardini *et al*. 2005, Scalise *et al*. 2005). Social organization is unknown, although the intermediate levels of mtDNA diversity observed in Cuvier's beaked whales suggest that social groups are unlikely to be strongly matrifocal (Dalebout *et al*. 2005).

Cuvier's beaked whale is mainly teuthophagic. The most common prey species in the Mediterranean are

from the family Histioteuthidae (MacLeod 2005 and references therein), which are oceanic and meso- or bathypelagic, inhabiting depths of around 1000 m, with a preference for escarpments. Fish may also be an important component of their diet (MacLeod 2005).

Threats

Owing to their offshore occurrence and tendency to feed on deep-sea squid, Cuvier's beaked whales are probably little exposed to human activities that occur in coastal waters (tourism, many types of fisheries, etc.). However, the few studies carried out on this species highlight one main threat: certain forms of man-made underwater noise. This threat affects the species world-wide and it has been responsible for some of the observed mortality in the Mediterranean. Military sonars and possibly high-energy sounds from other anthropogenic sources have repeatedly resulted in the stranding and death of Cuvier's beaked whales. The implications of this mortality at the population level are uncertain. Two other concerns are bycatch in drift gillnets and the ingestion of plastic debris.

Recent atypical mass strandings of beaked whales have been linked to high-powered navy sonar and seismic exploration (e.g. Frantzis 1998; Jepson *et al*. 2003; Fernández et al. 2005). Deployment of military sonar has led to strandings of beaked whales suffering from chronic and acute tissue damage due to the *in vivo* formation of gas bubbles, possibly the result of decompression sickness (Jepson *et al*. 2003; Fernández et al. 2005). Cuvier's beaked whale is the species most commonly involved in these atypical mass strandings (Brownell *et al*. 2005). Of 224 recorded stranding events of Cuvier's beaked whales in the Mediterranean, 15 involved 2 animals (9.8% of the total) and 12 involved 3 or more animals (totalling 80 animals; 26.1% of the total) (Podestà *et al*. 2006). Only one of these mass strandings was definitely associated with naval activity (Frantzis 1998). In the other cases, either no appropriate data were collected or the analyses were inadequate for assessing the potential association (Podestà et al. 2006). An atypical mass stranding of 4 Cuvier's beaked whales occurred in SE Spain in January 2006. This event was still being investigated at the time of writing. The Mediterranean Sea is a militarily strategic area, and is also of increasing interest for hydrocarbon exploration and exploitation. All military or geological or oceanographic activities involving high-intensity noise carried out in the proximity of Cuvier's beaked whales are of concern.

Although the population-level implications of the use of military sonar are uncertain, there is evidence suggesting that they could be at least locally significant. A photo-identification study that preceded and followed the Bahamas mass stranding showed that previously photo-identified, resident beaked whales either left the area or died, since they were never re-captured (photographically) after the event (Balcomb and Claridge 2001). In the Mediterranean Sea, no surveys had been conducted in the Kyparissiakos Gulf before the mass stranding following a naval military sonar exercise (Frantzis 1998). However, strandings of Cuvier´s beaked whales had been common in that area (average rate of one per semester) and have become extremely rare (none or only one) in the 9 years since the event. Two international surveys that covered the Kyparissiakos Gulf (IFAW 2003 and MVO in 2004) as well as a survey that has crossed the same area twice yearly since 2002 have failed to record any sightings of Cuvier´s beaked whales.

Cuvier's beaked whales are occasionally taken incidentally in driftnets in the Mediterranean Sea. In a study of cetacean by-catch by the Spanish Mediterranean longlining fleet, only one unidentified beaked whale was found entangled (released alive) out of 798 sets (CPUE<0.001 ind/1000 hooks; Valeiras and Camiñas 2001). In Italy 13 animals were reported as having been by-caught between 1986 and 1997 (Podestá and Bortolotto 1997; Centro Studi Cetacei 1998).

Fourteen Cuvier's beaked whales were reported as having been captured intentionally between 1972 and 1982 – 11 in French and 3 in Spanish waters, all shot and 1 also harpooned (Northridge 1994).

With regard to plastic debris, two stranded animals in Greece had stomachs full of pieces of plastic bags (A. Frantzis, pers. comm.), as did a stranded animal in Croatia (Holcer *et al*. 2003). Poncelet *et al*. (1999) described a considerable amount of plastic debris in the stomach of a Cuvier's beaked whale washed ashore on the French Atlantic coast. Together with pilot whales (and some other teuthophagous species), Cuvier's beaked whale seems to be attracted by plastic debris that may be mistaken for squid.

Conservation measures

One probable hot-spot for Cuvier's beaked whales in the Mediterranean, the eastern section of the

Ligurian Sea, is included within the Pelagos Sanctuary created by the Governments of Italy, France and Monaco . However, no management or conservation measures have been taken as yet specifically for this species.

A SPAMI (Specially Protected Area of Mediterranean Importance) under the Barcelona Convention has been proposed for the northern half of the Alborán Sea and Gulf of Vera in southern Spain (Cañadas *et al.* 2005), but it has not yet been designated or even evaluated by the Spanish administration. This proposed area includes another of the probable hot-spots for Cuvier's beaked whales: the deep waters off southern Almería. The Hydrographic Office of the Spanish Navy has agreed not to use active sonar in that area (C. Gamundi, Subdirector of the Hydrographic Office of the Spanish Navy, pers. comm.).

The Second Meeting of the Parties to ACCOBAMS adopted Resolution 2.16 on 'Assessment and Impact Assessment of Man-made Noise' (ACCOBAMS 2004). In this Resolution, and by recommendation of the Scientific Committee of ACCOBAMS, Parties are urged to 'to take a special care and, if appropriate, to avoid any use of man made noise in habitat of vulnerable species and in areas where marine mammals or endangered species may be concentrated, and undertake only with special caution and transparency any use of man made noise in or nearby areas believed to contain habitat of Cuvier's beaked whales (*Ziphius cavirostris*), within the ACCOBAMS area'. Parties are also urged to facilitate national and international research on this subject, to provide protocols/guidelines developed by military authorities with respect to use of sonar in the context of threats to cetaceans, and to consult with any profession conducting activities known to produce underwater sound with the potential to cause adverse effects on cetaceans, recommending that extreme caution be exercised in the ACCOBAMS area. Resolution 2.16 also encourages 'the development of alternative technologies and require the use of best available control technologies and other mitigation measures in order to reduce the impacts of man-made noise sources in the Agreement area'. The Scientific Committee of ACCOBAMS therefore has been charged to develop a common set of guidelines for conducting activities known to produce underwater sound with the potential to cause adverse effects on cetaceans. These guidelines are expected to be presented to the Third Meeting of the Parties in 2007.

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Annex 4

Visitor Species

Species	Common name	Sub-region
Balaenoptera acutorostrata	Common minke whale	Mediterranean Sea
Megaptera novaeangliae	Humpback whale	Mediterranean Sea
Pseudorca crassidens	False killer whale	Mediterranean Sea
Steno bredanensis	Rough-toothed dolphin	Mediterranean Sea
Orcinus orca	Killer whale	Mediterranean Sea

Common minke whale *(Balaenoptera acutorostrata)*

Taxonomy

Family

Balaenopteridae

Relevant Common Names

EN	common minke whale
FR	petit rorqual, rorqual à museau pointu
ES	rorcual aliblanco
AR	هركول صغير (harcul saghir)
HR	kljunasti kit
EL	βόρεια ρυγχοφάλαινα (voreia rynchofálaina)
HE	לויתן גוץ (livyatan gutz)
IT	balenottera minore
ML	baliena ta' geddumha ppuntat
PT	baleia-anã
TR	mink balinası

Assessment Information

NOT ASSESSED

Status: VISITOR in the Mediterranean, VAGRANT in the Black Sea

Year compiled

2006

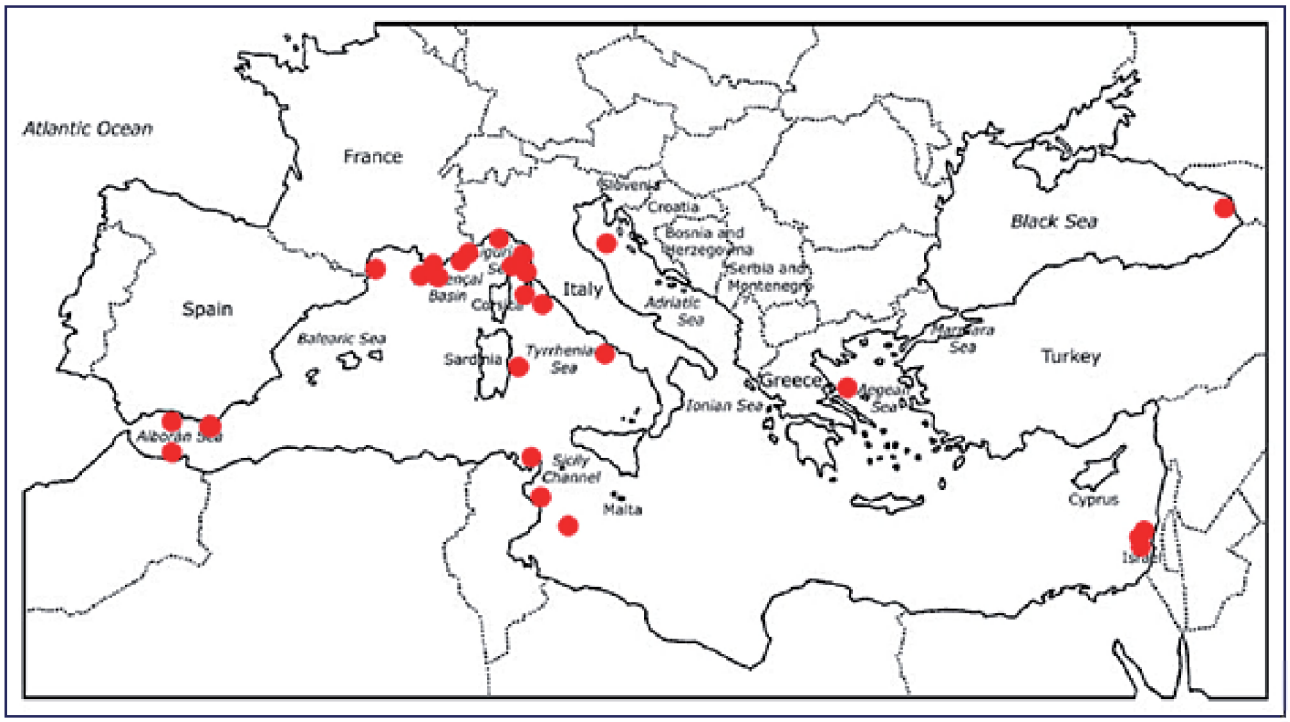
Compiled by:

Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
France	X				
Greece	X				
Israel	X				
Italy	X				
Morocco	X				
Spain	X				
Tunisia	X				
Georgia			X		



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1771	Adriatic Sea (likely location)		Possibly shorter than 4 m	Juvenile, acquired from the fish market in Bologna	Capellini 1877
1840 (Oct.)	Collioure, Pyrénées Orientales, France		5.40 m	Stranded. Skeleton conserved at Nat. Hist. Mus. Of Perpignan	Companyo 1841
1878 (18 Feb.)	Villefranche-sur-Mer, France		300 cm	Captured	Giglioli 1880
1880 (18 Apr.)	Batumi, Georgia		Possibly 9 m	Stranded	Tomilin 1967
1898 (Jun.)	Gulf of Baratti, Livorno, Italy	F	5.55 m		Parona 1908
1899 (6 Oct.)	Porto Santo Stefano, Grosseto, Italy		4.75 m	By-caught	Carruccio 1899, 1900
1911 (14 Nov.)	Marciana Marina, Elba Island, Italy		7-8 m	Found dead	Damiani 1911
1916 (26 Apr.)	Camogli, Italy			Juvenile (cranium and mounted skin) in Genoa Museum, possibly bycaught	Arbocco 1969
1925 (11 May)	Lacco Ameno, Ischia, Italy		6 m	By-caught in fixed tuna trap	Monticelli 1926
1975 (May)	Mahdia, Tunisia		head only (40 cm-long)		Ktari-Chakroun 1980
1976 (May)	Sidi Daoud, Tunisia		4.70 m	By-caught in fixed tuna trap	Ktari-Chakroun 1980
1977 (9 Jun.)	Bandol, France	F	375 cm	Captured	Van Waerebeek et al. 1999
1978 - 1981	Italian seas (unspecified)			2 different records of incidental capture in driftnets, involving 4 specimens	Di Natale and Mangano 1981
1978 - 1981	Italian coasts (unspecified)			One specimen stranded	Di Natale and Mangano 1981
1982 (20 Apr.)	St. Rapahel, France	F	360 cm	Stillborn, umbilical cord and placenta still attached	Bompar 2000
1991 (11 Mar.)	Lampedusa, Italy			Sighted off cliff, filmed	Notarbartolo di Sciara and Demma, 1997
1991 (17 May)	Turas, east coast of Sardinia (Italy)		3.5 m	Stranded	Centro Studi Cetacei 1994
1993 (16 May)	Viareggio, Lucca, Italy	M	7.65 m	Stranded alive	Centro Studi Cetacei 1996
1996 (October)	Beach of Casares, Malaga, Spain		4.5 m	Stranded	Van Waerebeek et al. 1999

1997 (31 Jul.)	Varazze, Savona, Italy	F	4.35 m	Stranded	Centro Studi Cetacei 1998
1997 (11 Aug.)	Porquerolles, France			Sighting (specific characters clearly described)	Van Waerebeek et al. 1999
1998 (12 Apr.)	Antignano, Livorno, Italy		3.4 m	Stranded	Centro Studi Cetacei 2000
1998 (24 Apr.)	Near Giens peninsula, France	M	340 cm	Stranded after having been caught in a net	Van Waerebeek et al. 1999, Robineau 2005
1998 (May)	Toulon region, France	M	365 cm	Bycaught (apparently a different individual from the previous one)	Macé et al. 1999
2000 (8 May)	Akko, Israel			Calf found entangled in a gillnet	Scheinin et al. 2004
2000 (23 May)	Skiathos Island, Greece	M	416 cm	Found dead	Verriopoulou et al. 2001
2002-2003	Al Hoceima, Morocco			Adult specimen by-caught in pelagic driftnet	Tudela et al. 2003
2004 (8 Feb.)	Haifa, Israel	F	5 m	Calf found entangled in a net	Scheinin et al. 2004
2006 (2 Feb.)	Kishon Port, Haifa, Israel		8 m	Sighted for several minutes at mouth of port	Goffman et al. 2006
2006 (18 Jul.)	Bay of Almerìa, Spain			Adult specimen sighted; documentation available	Ana Cañadas, pers. comm.

Note: Some references in the literature to minke whales in the region are not included in the table. These include: (a) unverifiable cases of “big whales”, possibly minke whales, observed in the Black Sea near the Georgian coasts between 1880 and 1926 (Kleinenberg 1956 in Van Waerebeek et al. 1999); (b) the stranding on 17 Aug. 1839 of a “balenòptero picudo” in Barcelona, reported by Yàñez in 1842 (Casinos and Vericad 1976), considered unverifiable by those authors; (c) a specimen 5.5-6 m long stranded near Castel Fusano, Ostia (Italy), on 15 Dec. 1911, reported by Carruccio (1913) as a minke whale, but later identified as a young fin whale (Lepri 1914); (d) undocumented sighting reports from the Ligurian and Tyrrhenian seas (e.g., Di Natale 1983, Giordano 1988), and from the western Mediterranean (Beaubrun 1995).

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Humpback whale *(Megaptera novaeangliae)*

Taxonomy

Family

Balaenopteridae

Relevant Common Names

EN	humpback whale
FR	mégaptère
ES	yubarta
AR	حوت أحدب (hout ahdab)
HR	grbavi kit
EL	μεγάπτερη φάλαινα (megápteri fálaina)
HE	לויתן - גדול - סנפיר (livyatan gadol snapir)
IT	megattera
ML	baliena tal-íwienah kbar
PT	megaptera, baleia-corcunda
TR	kambur balina

Assessment Information

NOT ASSESSED

Status: VISITOR in the Mediterranean Sea

Year compiled

2006

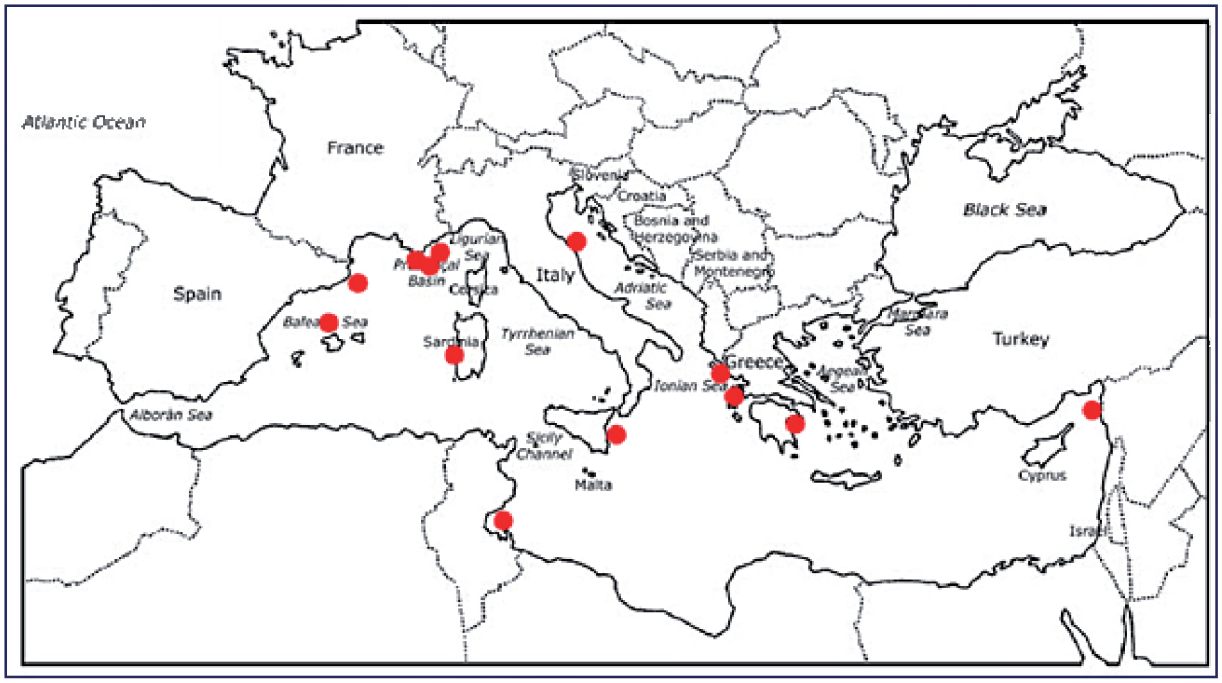
Compiled by:

Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
France	X				
Greece	X				
Italy	X				
Spain	X				
Syria	X				
Tunisia	X				



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1885 (Nov.)	Toulon, France		6.8 m	By-caught	Aguilar 1989
1986 (14 Mar.)	Majorca, Baleares, Spain			Sighting of two individuals, possibly a female with calf	Aguilar 1989
1990 (Mar.)	Bay of Aiguablava, Catalonia, Spain			Sighting of one possible adult	Personal comm. from A. Aguilar to Frantzis et al. 2004
1992 (2 Oct.)	Gulf of Gabés, Tunisia		8 m	By-caught	Chakroun 1994
1993 (21 May)	Cavalaire, France	F	7 m	By-caught	Bompar 2000
1993 (Aug.)	Toulon, France			Sighting of two individuals	Personal comm. from R. Sears to Frantzis et al. 2004
1998 (24 Jan.)	Gulf of Oristano, W. Sardinia, Italy		7-8 m	Sighting	Frantzis et al. 2004
2001 (17 Apr.)	Bay of Tolo, Myrtoon Sea, Greece		8-11 m	Sighting	Frantzis et al. 2004
2002 (19 Jul.)	Lefkada Island, Greece			Sighting	Frantzis et al. 2004
2002 (4 Aug.)	Senigallia, Italy			Sighting	Affronte et al. 2003
2003 (5 Apr.)	Tartous, Syria	M	785 cm	Stranded dead	Saad 2004
2004 (17 Feb.)	Corfu Island, Greece	F	7.2 m	By-caught	Frantzis et al. 2004
2004 (2 Apr.)	Siracusa, Sicily, Italy		About 10 m	By-caught alive and released	Centro Studi Cetacei 2006

Data Sources

Affronte M., Stanzani L.A., Stanzani G. 2003. First record of a humpback whale, *Megaptera novaeangliae* (Borowski, 1781) in the Adriatic Sea. Annals of Istrian and Mediterranean Studies 13(1):51-54.

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Killer whale or Orca *(Orcinus orca)*

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	killer whale, orca
FR	orque, épaulard
ES	orca, esparte
AR	أركة (arqa)
HR	orka, kit ubojica
EL	όρκα (orka)
HE	קטלן (katlan)
IT	orca
ML	orka
PT	orca
TR	katil balina

Assessment Information

NOT ASSESSED

Status: VISITOR in the Mediterranean Sea

Year compiled

2006

Compiled by:

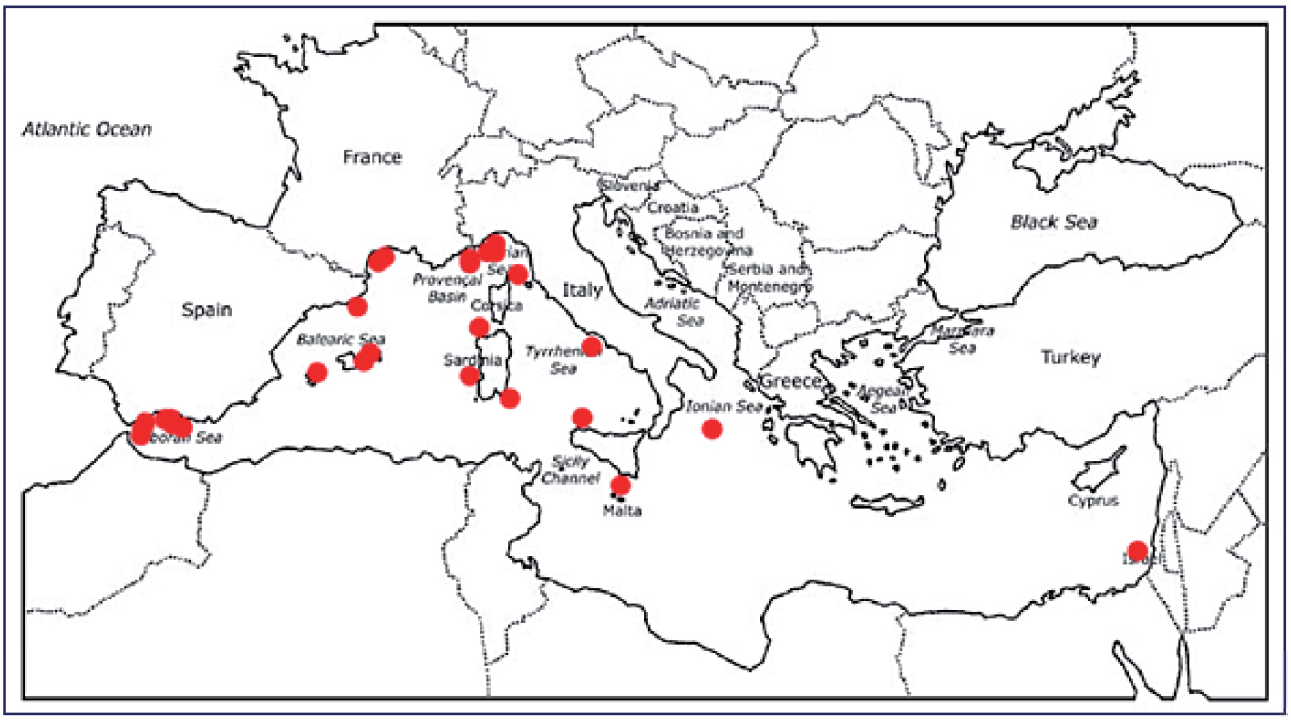
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France	X				
Gibraltar (UK)	X				
Greece					
Israel	X				
Italy	X				
Lebanon					
Libya					

Malta		X			
Monaco	X				
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain	X				
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
No date	Near Sète, France			Cranium of a captured specimen, reportedly in the Museum of Paris	Van Beneden 1889
No date	Unknown, but supposedly Mediterranean			Cranium in the Museum of Marseille	Duguy and Cyrus 1976
No date	Mediterranean			Two crania in the museum of Palermo, Sicily	Giglioli 1880
No date	Asinara Island, Sardinia, Italy			Cranium in the museum of Florence	Notarbartolo di Sciara 1987
No date	Between Sicily and Malta			One specimen reportedly captured	Cornalia 1870
No date	"coast of Israel"				Marchessaux 1980 quoting Bodenheimer 1960
Mid-XIX cent.	Palavas, France			Cranium of a stranded juvenile, reportedly in the Museum of Paris	Van Beneden 1889, Bompar 2000
1896 (27 May)	Off Monaco	F	4.10-5.9 m	Two females captured from a pod of three	Albert, Prince of Monaco 1898, Richard and Neuville 1936
1897 (17 Jun.)	Mediterranean waters near Gibraltar, Spain			Sighting of an adult and two young	Casinos and Vericad 1976 citing Richard 1936
1902 (22 Jul.)	Mediterranean waters near Gibraltar, Spain	F	4.7 m	Captured	Casinos and Vericad 1976 citing Richard 1936
1914 (?)	Mediterranean waters near Gibraltar, Spain		Adult		Casinos and Vericad 1976 citing Cabrera 1914
1926 (15 May)	El Prat de Llobregat, Barcelona, Spain		5.3 m	Captured	Anon. 1926

1941 (26 Dec.)	Cap de Tera, Majorca, Spain		5.3 m	Stranded when pursuing a school of dolphins	Casinos and Vericad 1976 citing Navarro 1943
About 1966	Sa Torreta, Minorca, Spain		A little longer than 6 m	Stranded	Casinos 1981
1970s	Ionian Sea			Pod sighted from Italian research vessel "Bannock", description unambiguous	Pers. comm.. from Gilberto Gandolfi in Notarbartolo di Sciara 1981
1972 (Jun.)	Scopello, Palermo, Italy			Bycaught in traditional fixed tuna trap	Di Natale and Mangano 1983
1974 (15 Feb.)	Off Cap Feno, Corsica, France			Floating carcass reported	Duguy 1975, Hammond and Lockyer 1988
1984 (27 Jun.)	E of Capo Carbonara, Sardinia, Italy			Pod of 3 sighted	Raga et al. 1985, Hammond and Lockyer 1988
1985 (14 Aug.)	75 km SE of San Remo, Italy		About 5 m	Individual sighted and photographed	Notarbartolo di Sciara 1987
1985 (16 Aug.)	30 km S of San Remo, Italy			Pod of two sighted and filmed, one recognised as specimen of 14 Aug. 1986	Notarbartolo di Sciara 1987
1985 (1 Oct.)	30 km S of Finale Ligure, Italy			Same specimen as the one sighted on 14 and 16 Aug. 1985, photographed feeding on a *Ziphius* carcass	Notarbartolo di Sciara 1987
1987 (Jul.)	Between the islands of Ponza and Ventotene, Italy			Pod of about 12 sighted, filmed	Bompar 2000
1990 (7 Aug.)	Maro, Malaga, Spain		5.3 m	Stranded	Aguilar et al. 1997
1990 (9 Dec)	Salobreña, Granada,Spain		5.5 m	Stranded	Aguilar et al. 1997
1991 (8 May)	Marbella, Malaga, Spain	F	5.25 m	Stranded	Gil-de-Sola Simarro 1992
1991 (5 Jul.)	Marbella, Málaga, Spain		5.6 m	Stranded	Aguilar et al. 1997
1991 (15 Sep.)	Fuengirola, Malaga, Spain	F	3.5 m	Stranded	Gil-de-Sola Simarro 1992
1991 (Sep.)	NE of Corsica			Pod of 4 sighted	Bompar 2000
1982 (15 Mar.)	2 n.m. of Cape Sicié, Var, France			Pod of 6 sighted	Bompar 2000

Note: The following events and reports were not listed in the table above: (a) an account given by Pliny the Elder of a killer whale captured by the emperor Claudius in the harbour of Ostia in the first century A.D (Pliny the Elder 1983); (b) a doubtful capture reported by L. Companyo during the XIX cent. near Canet, Pyrénés-Orientales (Bompar 2000); (c) an occurrence in Malta mentioned without further detail by Tomilin (1967); (d) undocumented sightings reported by amateurs or causal observers to Di Natale and Mangano (1983), McBrearty et al. (1986) and Beaubrun (1995); (e) mentions of killer whale occurrences by Duguy et al. (1983a, b), with no detail provided; (f) undocumented sightings by Folco Quilici, pers. comm. to Notarbartolo di Sciara (1987).

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False killer whale *(Pseudorca crassidens)*

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	false killer whale
FR	faux-orque
ES	falsa orca
AR	أركة مزيفة (arqa mouzaïfa)
HR	crni dupin
EL	ψευδόρκα (psevdórka)
HE	עבשן קטלני (av-shen katlan)
IT	pseudorca
PT	falsa orca
TR	yalanci katil balina

Assessment Information

NOT ASSESSED

Status: VISITOR in the Mediterranean Sea

Year compiled

2006

Compiled by:

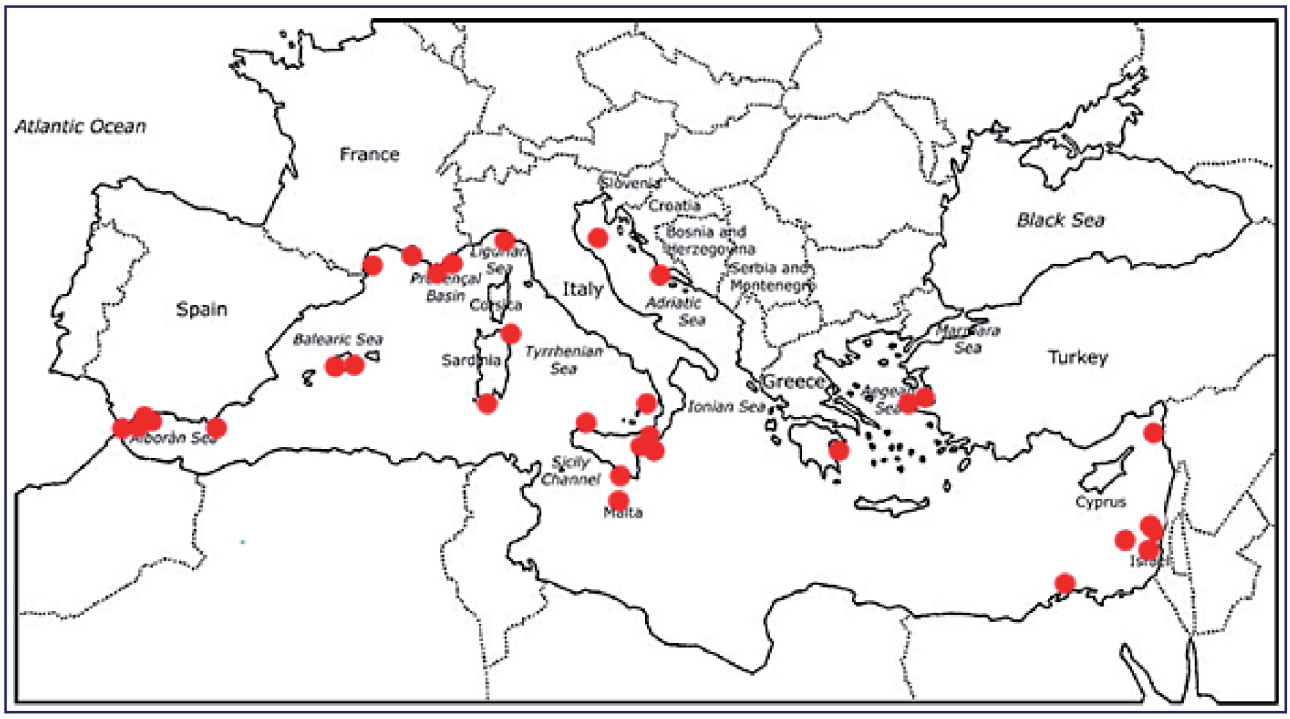
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia	X				
Cyprus					
Egypt	X				
France	X				
Gibraltar (UK)	X				
Greece	X				
Israel	X				
Italy	X				
Lebanon					
Libya					
Malta	X				

Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain	X				
Syria	X				
Tunisia					
Turkey	X				



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1787 (22 Jun.)	Gulf of Saint-Tropez, France			Several specimens captured from a large pod. Specimen material destroyed during French Revolution, but crania described in Bonnaterre 1789.	Paulus 1963
1857 (Jun.)	Elne, Pyrénées Orientales, France			Young specimen stranded	Paulus 1963 quoting van Beneden and Gervais
1877	Palermo, Sicily, Italy			Skull collected; possibly same as4 m-long specimen stranded in Jun. 1876 near Trabia, Sicily, quoted by Giglioli 1882	Riggio 1882 in Cagnolaro et al. 1989; Giglioli 1882
1893 (8 Feb.)	Camogli, Genoa, Italy	F	4 m	Stranded. Complete skeleton in Genoa museum	Vinciguerra 1926, Paulus 1963, Arbocco 1969
1900	Sicilian waters			Two specimens captured; skulls preserved at Calci (Pisa) museum	Vinciguerra 1926
1926 (Apr.)	Catona, Calabria, Italy			Stranded	Vinciguerra 1926, Paulus 1963
1930 (Jul.)	Marbella, Spain			Stranded	Paulus 1963, Castells and Mayo 1994
1933 (Feb.)	Strait of Messina, Sicily, Italy			About 30 preying on bluefin tuna; two captured.	Beltrame 1933, Scordìa 1939, Orsi Relini and Cagnolaro 1996
1936 (27 Oct.)	Korčula, Croatia		180 cm	Bycaught	Hirtz 1937
1939 (Feb.)	Strait of Messina, Sicily, Italy			Pod of about 100 sighted, preying on bluefin tuna	Scordìa 1939
1943 (16 Mar.)	Majorca, Spain		4.41 m	Captured specimen	Casinos and Vericad 1976 citing Massuti 1943,Castells and Mayo 1994

1948 (Nov.). Due to an inconsistency in the report, year could also be 1928	Off Port-de-Bouc, near Marseille, France		4.8 m	Captured in tuna net	Paulus 1963
1951 (Aug.)	Ile du Levant, France			Stranded	Paulus 1963
1955 (31 Jul.)	Malta fish market			Taken and sold as bait for £1	Lanfranco 1969
1955 (year of report; no actual date specified)	2 miles North of Baltim, Nile's Delta, Egypt			Fragment of skull found on beach	Wassif 1956, Marchessaux 1980
Between 1959 and 1961	Northern Adriatic Sea, Italian shores			From a pod of 30-40 a group of 7 captured; 4 escaped, and 2 were killed.	Stanzani and Piermarocchi 1992
1966 (3 Sep.)	20 nm East of Marbella, Spain			Pod of about 20 sighted	Pilleri 1967, Busnel and Dziedzic 1968, Castells and Mayo 1994
Sometime between 1978 and 1982	Off the Tyrrhenian coast of Calabria, Italy			Two specimens captured in drifting longline	Di Natale and Mangano 1983
1988 (Mar.)	Colonia de San Pedro, Majorca, Spain			Adult stranded	Castells and Mayo 1994
1988 (20 May)	Gela, Sicily, Italy	M	460 cm	Found stranded in advanced decomposition	Cagnolaro et al. 1989, Centro Studi Cetacei 1990
1989 (22 Nov.)	Santa Margherita di Pula, Sardinia, Italy	F	4 m	Stranded	Centro Studi Cetacei 1991
1989	Strait of Gibraltar			Pod of about 15 sighted	Castells and Mayo 1994
1991 (1 May)	Capriccioli, Sardinia, Italy		About 6 m	Stranded in advanced decomposition	Centro Studi Cetacei 1994
1991 (22 Jun.)	Few km South of Lattakia, Syria			Skull found on beach	Kasparek 1997
1992	Between Chios Island, Greece, and Chesme (Turkey)			7+ individuals sighted and photographed	Frantzis et al. 2003
1993	Argolikos Gulf, Aegean Sea, Greece			Stranded	Frantzis et al. 2003
1995	Izmir Bay, Turkey			Stranded alive and died afterwards	Ozturk and Ozturk 1998, Frantzis et al. 2003, Güçlüsoy et al. 2004, Güçlüsoy 2005
1995 (3 Sep.)	Carboneras, Andalusia, Spain			Pod of 8 sighted	Sagarminaga and Cañadas 1997
2003 (28 Mar.)	70 nm West of the Israeli coastline (33° 18'N, 0033° 44'E)			Pod of about 20 sighted and photographed	Scheinin et al. 2004
2004 (30 Jun.)	Nature reserve of Habonim, Israel			Stranded in advanced decomposition	Dani Kerem, Aviad Scheinin, in litt.
2005 (24 Apr.)	50 nm West of Haifa			Pod sighted and filmed	Aviad Scheinin, in litt.
2006 (26 May)	20 nm West of Northern Israel			Two sighted.	Aviad Scheinin, in litt.

Note: Seven sightings by non-specialists reported by McBrearty et al. 1986 are not listed above because they are not sufficiently documented.

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Rough-toothed dolphin *(Steno bredanensis)*

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	rough-toothed dolphin
FR	steno, dauphin à bec étroit
ES	delfin de dientes rugosos
AR	ستينو (steno)
HR	grubozubi dupin
EL	στενόρυγχο δελφίνι (stenóryncho delfíni)
HE	דולפין תלום-שינים (dolphin tlum-shinaim)
IT	steno
ML	delfin tat-tikki
PT	caldeirão
TR	kaba dişli yunus

Assessment Information

NOT ASSESSED

Status: VISITOR in the Mediterranean Sea

Year compiled

2006

Compiled by:

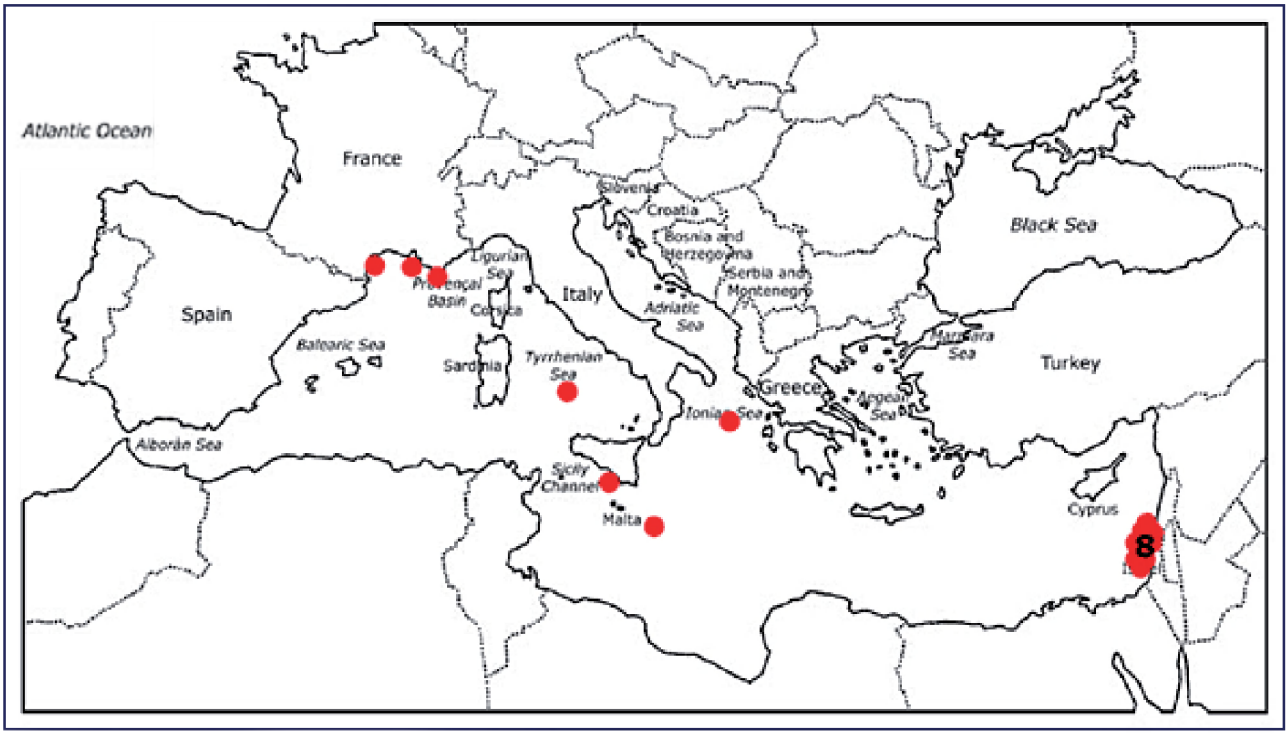
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France	X				
Gibraltar (UK)					
Greece	X				
Israel	X				
Italy	X				
Lebanon					
Libya					

Malta					
Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain					
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
unknown	Tyrrhenian Sea, Italy			Cranium in the collections of the museum of Florence	Giglioli 1880
unknown	Gulf of Marseille, France			Cranium in the collections of the museum of Marseille	Robineau 1975
1926	Near Embiez islands, Toulon, France			By-caught, not preserved, but identification certain	Robineau 1975 citing Neuville 1927
1949 (?)	Haifa, Israel			Cranium in the collections of the British Museum	Marchessaux and Duguy 1978
1970 (Sep.)	Gulf of Aigues-Mortes, France	F	2.35 m	Captured in tuna net	Granier 1970-1972
1985 (4 Sep.)	Ionian Sea, 170 km South of Sicily			Aggregation of about 160 sighted, photographed and acoustically recorded	Watkins et al. 1987
1997 (16 Mar.)	3 km North of the Gaza Strip border, Israel	M		Stranded calf	Dani Kerem, in litt.
1998 (1 Mar.)	Between Jaffa and Tel Aviv, Israel	M		Stranded calf	Dani Kerem, in litt.
1998 (13 Apr.)	25 km South of Haifa, Israel	F		Stranded sub-adult	Dani Kerem, in litt.
2002 (16 Feb.)	Atlit shore, Israel	M		Juvenile stranded dead, after having been bycaught	Oz Goffman, in litt.
2002 (5 Apr.)	Donnalucata, Ragusa, Italy	4 M 2 F	1.99-2.42 m	6 stranded alive; 3 died, 3 released alive	Centro Studi Cetacei 2004
2003 (9 Mar.)	Carmel Beach, Haifa, Israel	F	160 cm	Calf entangled in gill-net, still nursing but starting to take solids (fish, cephalopods)	Goffman et al. 2006
2003 (20 Mar.)	Nahariyya beach, Israel	M	191 cm	Stranded, partly decomposed	Goffman et al. 2006

2003 (Sep.)	Ionian Sea, about 150 km W of Kefalonia Is., Greece			Pod of 8 sighted, photographic documentation available	Lacey et al. 2005
2005 (22 Mar.)	Port of Haifa, Israel			Pod of about 30, remaining in the harbour and feeding on mullet all day (copious documentation available)	Kerem 2005
2006 (14 Mar.)	Nahariyya beach, Israel	F	187 cm	Stranded, partly decomposed	Goffman et al. 2006

Note. The following records were not included: (a) an unsubstantiated personal communication by R. Busnel to Collet (1984) of "about 10" rough-toothed dolphins taken in the Mediterranean Sea in the 1950s, on behalf of the Laboratoire de Physiologie Acoustique in France; (b) questionable sighting reported by non-specialists in the Gulf of Taranto (Ionian Sea) and Strait of Sicily (Di Natale 1983); and (c) questionable sightings in the Strait of Gibraltar (Hashmi and Adloff 1991).

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Annex 5

Vagrant Species

Species	Common name	Sub-region
Balaenoptera acutorostrata	Common minke whale	Black Sea*
Balaenoptera borealis	Sei whale	Mediterranean Sea
Eubalaena glacialis	North Atlantic right whale	Mediterranean Sea
Hyperoodon ampullatus	Northern bottlenose whale	Mediterranean Sea
Kogia sima	Dwarf sperm whale	Mediterranean Sea
Mesoplodon bidens	Sowerby's beaked whale	Mediterranean Sea
Mesoplodon densirostris	Blainville's beaked whale	Mediterranean Sea
Mesoplodon europaeus	Gervais' beaked whale	Mediterranean Sea
Phocoena phocoena	Harbour porpoise	Mediterranean Sea
Sousa chinensis	Indo-Pacific humpback dolphin	Mediterranean Sea

* see pages 92 - 95

Sei whale *(Balaenoptera borealis)*

Taxonomy

Family

Balaenopteridae

Relevant Common Names

EN	sei whale
FR	rorqual de Rudolphi
ES	rorqual boreal
AR	هركول رودلفي (harcul Rudolphi)
HR	sjeverni kit
EL	βορειοφάλαινα (voreiofálaina)
HE	לויתן צפוני (livyatan tzefoni)
IT	balenottera boreale
ML	baliena tan-nofsinhar
PT	baleia sardinheira
TR	kuzey balinasi

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean Sea

Year compiled

2006

Compiled by:

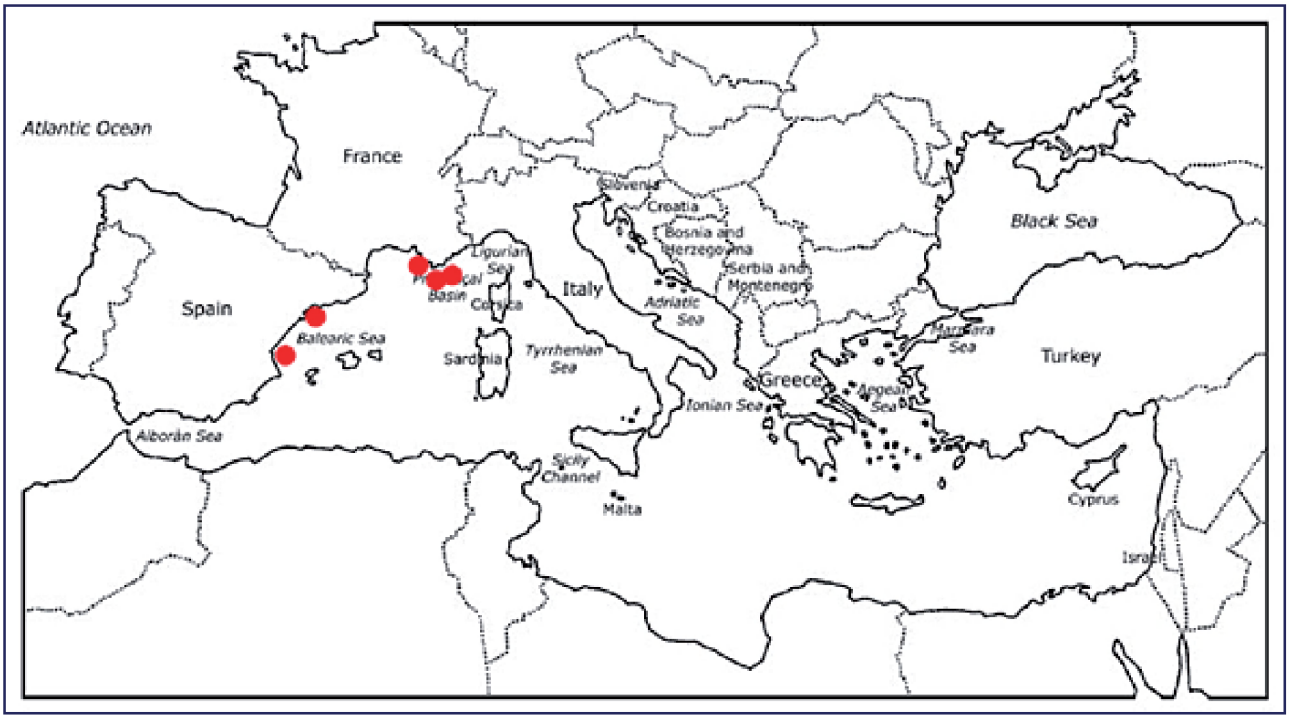
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France			X		
Gibraltar (UK)					
Greece					
Israel					
Italy					
Lebanon					
Libya					

Malta					
Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain			X		
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1921 (5 Jun.)	Valréas, Hérault, France		15.2 m	Stranded, photographic documentation available	Beaubrun 1995, Bompar 2000
1952 (1 Jun.)	Off Valencia, Spain			Albino specimen sighted and filmed by Alain Bombard	Bompar 2000
1973 (25 Sep.)	Punta del Fangar, Ebro Delta, Spain	F	7.30 m	Stranded alive,	Casinos and Vericad 1976
1987 (Aug.)	Off Port Cros, Var, France			Group of 2 sighted	Bompar 2000
1987 (30 Sep.)	25 n.m. offshore, Var, France			Group of 2 sighted, identification considered certain	Bompar 2000

Note: The following reports of sei whales in the Mediterranean were omitted from the list above: (a) an undocumented sighting of 10 sei whales in the Gulf of Genoa mentioned by Horwood (1987), quoting Kirpichnikov (1950); (b) a young rorqual captured near Tunis on 21 Oct. 1949, identified as *B. borealis* by Heldt (1949), considered doubtful by Ktari-Chakroun (1980); (c) unsubstantiated occurrences in the Adriatic in 1880 and in the Gulf of Taranto (Ionian Sea) in the late 1940s (Bompar 2000). For a summary of occurrences and catches of sei whales in the Strait of Gibraltar and in the Atlantic waters west of Gibraltar, see Horwood (1987).

Data Sources

Beaubrun P.C. 1995. Atlas préliminaire de distribution des cétacés de Méditerranée. CIESM, Monaco. 87 pp.

Bompar J.M. 2000. Les cétacés de Méditerranée. Edisud, La Calade, Aix-en-Provence. 188 pp.
Casinos A., Vericad J.R.. 1976. The cetaceans of the Spanish coasts: a survey. Mammalia 40:267-289.
Heldt H. 1949. Incursions de baleinoptères sur les cotes tunisiennes. Annales Biologiques (Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark) 6:80.
Horwood J. 1987. The sei whale: population biology, ecology & management. Croom Helm. 375 pp.
Ktari-Chakroun F. 1980. Les cétacés des côtes tunisiennes. Bulletin de l'Institut d'Océanographie et Pêche Salammbo 7:139-149.

North Atlantic right whale *(Eubalaena glacialis)*

Taxonomy

Family

Balaenidae

Relevant Common Names

EN	North Atlantic right whale
FR	baleine franche
ES	ballena franca
AR	حوت بيسكاي (hout biscai)
HR	ledni kit
EL	σωστή φάλαινα (sostí fálaina)
HE	בלנה שחורה (balena shechora)
IT	balena franca boreale
ML	baliena tan-nofsinhar
PT	baleia franca
TR	gerçek kukei balinasi

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean Sea

Year compiled

2006

Compiled by:

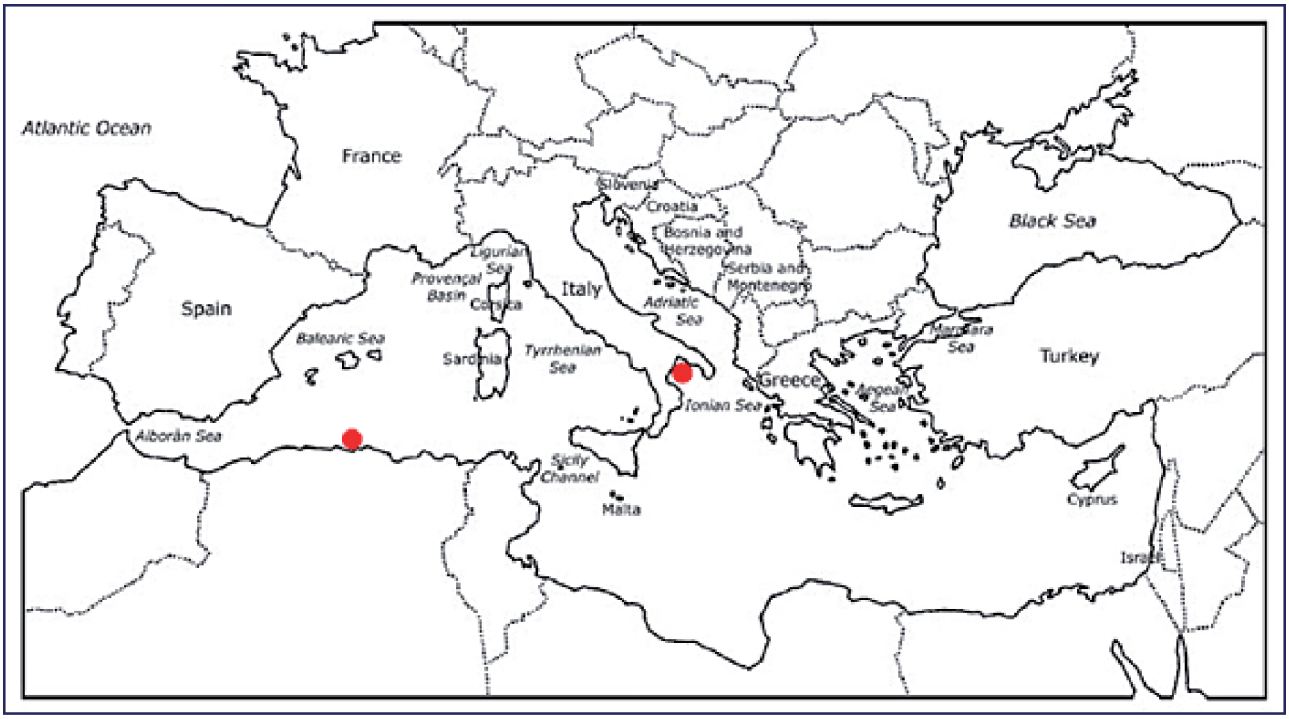
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria			X		
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France					
Gibraltar (UK)					
Greece					
Israel					
Italy			X		
Lebanon					
Libya					

Malta					
Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain					
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1877 (9 Feb.)	Taranto, Italy	F	12 m	Captured. Skeleton mounted in the Naples museum.	Capellini 1877, Gasco 1878
1888 (20 Jan.)	Bay of Castiglione near Algiers, Algeria		11 m	One of two sighted, captured and killed. Skeleton in the Paris museum.	Pouchet and Beauregard 1888, Bompar 2000

Note: A reported sighting in May 1991 of a right whale off S. Antioco, SW Sardinia, Italy (Rossi 1996, Bompar 2000), is not listed above. Although underwater photographic documentation of the sighting exists, unambiguously depicting a right whale, repeated attempts always failed to contact the photographer, Fiorenzo Mogno, to obtain detailed information on such an extraordinary occurrence. The sighting is therefore considered doubtful, pending confirmation.

Data Sources

Bompar J.M. 2000. Les cétacés de Méditerranée. Edisud, La Calade, Aix-en-Provence. 188 pp.

Capellini G. 1877. Della balena di Taranto, confrontata con quelle della Nuova Zelanda, e con talune fossili del Belgio e della Toscana. Tipi Gamberini e Parmeggiani, Bologna. 34 pp.

Gasco F. 1878. Intorno alla balena presa in Taranto nel febbraio 1877. Napoli, Tipografia dell'Accademia Reale delle Scienze. 47 pp.

Pouchet G., Beauregard H. 1888. Sur la présence de deux baleines franches dans les eaux d'Alger. Comptes-Rendus de l'Académie des Sciences, Paris 106:875-876.

Rossi D.M. 1996. La terza volta della balena franca. Airone 184(8):18.

Northern bottlenose whale *(Hyperoodon ampullatus)*

Taxonomy

Family

Ziphiidae

Relevant Common Names

EN	northern bottlenose whale
FR	hyperoodon boréal
ES	ballena nariz de botella del norte
AR	
HR	
EL	βόρειος υπερώόδοντας (vóreios yperoódontas)
HE	
IT	iperodonte boreale
ML	
PT	
TR	

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean Sea

Year compiled

2006

Compiled by:

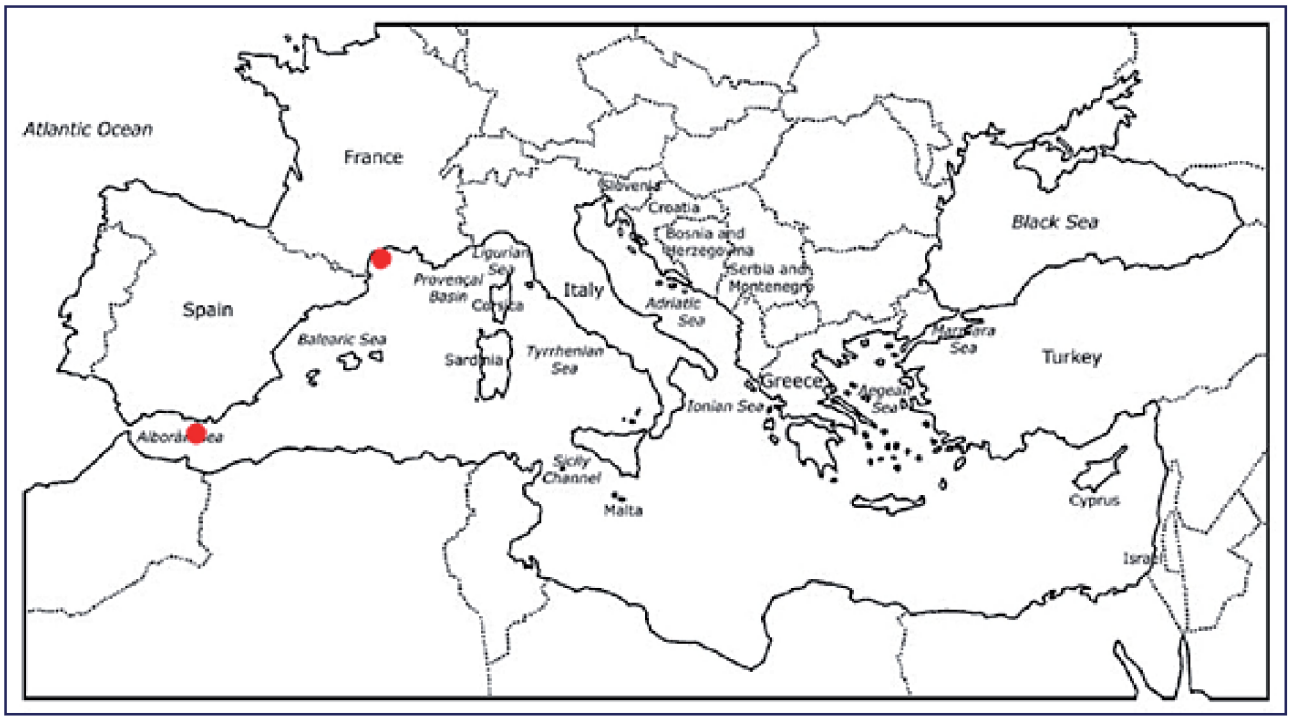
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France			X		
Gibraltar (UK)					
Greece					
Israel					
Italy					
Lebanon					
Libya					

Malta					
Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain			X		
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1880 (26 Sep.)	Gulf of Aigues-Mortes, Languedoc-Roussillon, France	F, ?	9 m, 5 m	Mother and calf stranded alive and captured. Accurate drawings, descriptions and measurements.	Clément 1881, Bompar 2000
None provided	Alborán Sea off Spain			Sighting mentioned. Reliable description given by A. Cañadas, pers. comm.	Cañadas and Sagarminaga 2000

Note: Several reports of *Hyperoodon ampullatus* from the Mediterranean turned out to be misidentified *Ziphius cavirostris* or remain doubtful, and were therefore not listed. These include: (a) the capture of a Cuvier's beaked whale in Liguria reported by Mezzana in 1900; (b) doubtful occurrences off Tuscany in 1835, off Languedoc, near Fontignan in 1850, and off Corsica, all mentioned by Bompar (2000); (c) an undocumented sighting reported by casual observers to McBrearty et al. (1986); (d) two Cuvier's beaked whales misidentified as *H. ampullatus* off Croatia: one specimen captured near Cavtat in 1939, reported by Hirtz in 1940, and a second specimen that remained for a while in Župski Bay, near Cavtat, in March 2001, before dying (Holčer et al. 2003).

Data Sources

Bompar J.M. 2000. Les cétacés de Méditerranée. Edisud, La Calade, Aix-en-Provence. 188 pp.

Cañadas A., Sagarminaga R. 2000. The northeastern Alborán Sea, an important breeding and feeding ground for the long-finned pilot whale (*Globicephala melas*) in the Mediterranean Sea. Marine Mammal Science 16(3):513-529.

Clément S. 1881. L'hyperoodon de Baussard ou de Rutskoff (de Lacépède) (*Hyperoodon rostratus*,

Duvernoy). Bulletin de la Socété d'Études des Sciences Naturelles de Nîmes, Jan. 1881:14-16.
Hirtz M. 1940. Kljunata uljarka (*Hyperoodon ampullatus* Forst.) u vodama Jadrana. Priroda 23:21-24.
Holčer D., Notarbartolo di Sciara G., Fortuna C.M., Onofri V., Lazar B., Tvrtkovic N. 2003. The occurrence of Cuvier's beaked whale (Ziphius cavirostris) in Croatian Adriatic waters: historical and recent findings. Pp. 255-256 in: V. Besendorfer, N. Kopjar (eds.), Proceedings of the 8th Croatian Biological Congress, Zagreb.
McBrearty,D.A. M.A.Message G.A.King 1986. Observations on small cetaceans in the north-east Atlantic Ocean and the Mediterranean Sea: 1978-1982. Pp. 225-249 in: M.M. Bryden and R. Harrison (eds.). Research on dolphins. Clarendon Press, Oxford. 478 pp.
Mezzana N. 1900. Sulla cattura di un *Hyperoodon bidens* Flem. nel Mare Ligustico. Bollettino del Naturalista 20(11):121-122.

Dwarf sperm whale *(Kogia sima)*

Taxonomy

Family

Kogiidae

Relevant Common Names

EN	dwarf sperm whale
FR	cachalot nain
ES	cachalote enano
AR	عنبر قزم (ambar kism)
HR	patuljasta ulješura
EL	νάνος φυσητήρας (nános fysitíras)
IT	cogia di Owen
ML	baliena mmnieóra ðatt
PT	cachalote anão
TR	cüce kaşalot

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean Sea

Year compiled

2006

Compiled by:

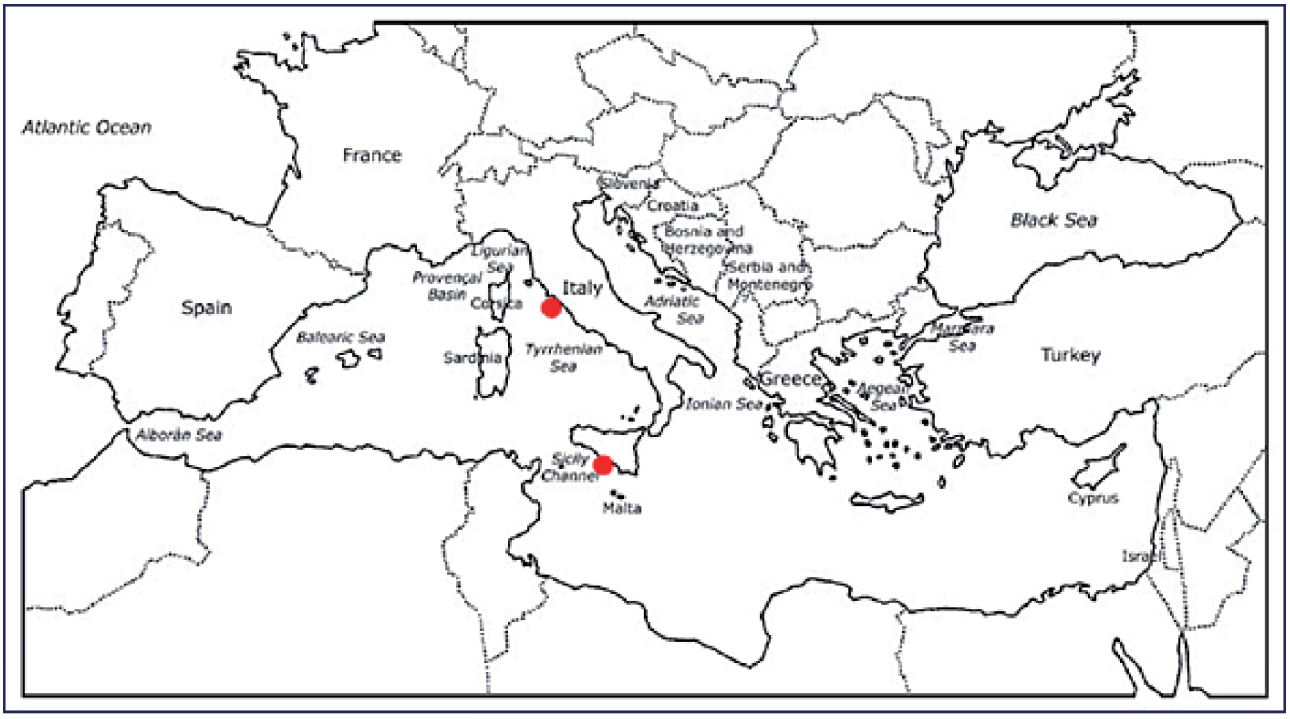
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France					
Gibraltar (UK)					
Greece					
Israel					
Italy			X		
Lebanon					
Libya					
Malta					

Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain					
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1988 (24 May)	Foce del Charone, Grosseto, Italy		2.20 m	Stranded. Skeleton in museum in Siena.	Centro Studi Cetacei 1990, Baccetti et al. 1991
2002 (8 Sep.)	Eraclea Minoa, Agrigento, Italy	M	2.07 m	Stranded alive, and later died. Skeleton in museum in Comiso.	Centro Studi Cetacei 2004

Data Sources

Baccetti N., Cancelli F., Renieri T. 1991. First record of *Kogia simus* (Cetacea, Physeteridae) from the Mediterranean Sea. Mammalia 55(1):152-154.

Centro Studi Cetacei. 1990. Cetacei spiaggiati lungo le coste italiane. III. Rendiconto 1988. Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano 130(21):269-287.

Centro Studi Cetacei. 2004. Cetacei spiaggiati lungo le coste italiane. XVII. Rendiconto 2002 (Mammalia). Atti della Società Italiana di Scienze Naturali, Museo Civico di Storia Naturale di Milano 145(1):155-169.

Beaked whales belonging to the genus *Mesoplodon*

Taxonomy

Family

Ziphiidae

Relevant Common Names

	Mesoplodon densirostris	*Mesoplodon europeaus*	*Mesoplodon bidens*
EN	Blainville's beaked whale	Gervais' beaked whale	Sowerby's beaked whale
FR	mésoplodon de Blainville	mésoplodon de Gervais	mésoplodon de Sowerby
ES	ballenato de hocico de Blainville	ballenato de hocico de Gervais	ballenato de hocico de Sowerby
AR	حوت بلانفيل ذات المنقار		
	(hout Blainville that alminkar)		
HR	Blainvilleov kit		
EL	πυκνόρυγχος μεσοπλόδοντας		διδοντος μεσοπλόδοντας
	(pyknórynchos mesoplódontas)		(didontos mesoplódontas)
IT	mesoplodonte di Blainville	mesoplodonte di Gervais	mesoplodonte di Sowerby
ML	baliena ta' Blainville	baliena ta' Gervais	baliena ta' Sowerby
PT	baleia de bico de Blainville	baleia de bico de Gervais	baleia de bico de Sowerby
TR	gagali balina		

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean Sea

Year compiled

2006

Compiled by:

Giuseppe Notarbartolo di Sciara

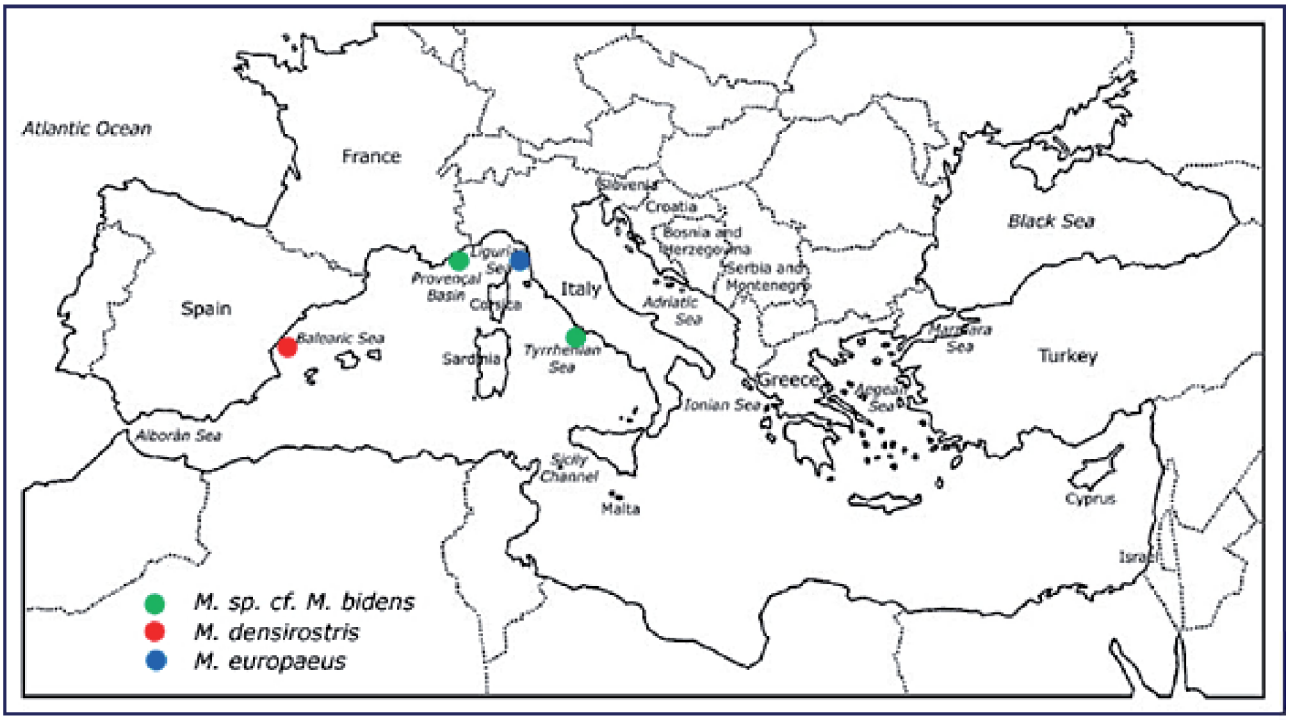
Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France			●		
Gibraltar (UK)					
Greece					

Israel					
Italy			◆ ●		
Lebanon					
Libya					
Malta					
Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain			X		
Syria					
Tunisia					
Turkey					

Mesoplodon densirostris = **X**
Mesoplodon europaeus = ◆
Mesoplodon sp. cf. *M. bidens* = ●



Known occurrences of *M. densirostris* in the region

Date	Location	Sex	Size	Notes	Reference
1980 (17 Feb.)	Beach of Alcossebre, Castellò de la Plana, Spain	F	4.21 m	Stranded.	Casinos and Filella 1981

Known occurrences of *M. europaeus* in the region

Date	Location	Sex	Size	Notes	Reference
2001 (9 Aug.)	Castiglioncello, Livorno, Italy	F	4.5 m	Stranded. Specimen preserved in Milan museum.	Podestà et al. 2005

Known occurrences of *Mesoplodon sp. cf. M. bidens* in the region

Date	Location	Sex	Size	Notes	Reference
1927 (9 Nov.)	Foce Verde, Latina, Italy	F		Stranded. Genus identified from position of teeth in the mandible. Specific identification tentative.	Brunelli and Fasella 1928

1996 (15 Aug.)	Iles de Lérins, Alpes-Maritimes, France			Two stranded alive, released without collecting tissue samples or other evidence to confirm identity. Species identification likely.	Bompar 2000; also J. Mead, pers. comm.

Notes: (a) van Bree (1975) argued convincingly that several records of *M. bidens* in the Mediterranean had been based on the description of the mythical cetacean *Epiodon urganantus* by Rafinesque in 1814. (b) Frantzis et al. (2003) reported the finding of a ziphiid specimen in the Peloponnesus in March 1989, which they identified as *M. bidens* based on the position of a mandibular tooth apparent in the only poor-quality photograph available at the time of their publication. However, once the cranium of the specimen subsequently became available, it was possible to identify it as *Z. cavirostris* based on the apical position of the teeth (A. Frantzis, pers. comm.).

Data Sources

Bompar J.M. 2000. Les cétacés de Méditerranée. Edisud, La Calade, Aix-en-Provence. 188 pp.

Brunelli G., Fasella G. 1928. Su di un rarissimo cetaceo spiaggiato sul litorale di Nettuno. Atti dell'Accademia Nazionale dei Lincei, Rendiconti Classe di Scienze Fisiche matematiche e Naturali 6(7):85-87.

Casinos A., Filella S. 1981. Notes on cetaceans of the Iberian coasts: IV. A specimen of *Mesoplodon densirostris* (Cetacea, Hyperoodontidae) stranded on the Spanish littoral. Säugetierkundliche Mitteilungen 29(4):61-67.

Frantzis A., Alexiadou P., Paximadis G., Politi E., Gannier A., Corsini-Foka M. 2003. Current knowledge of the cetacean fauna of the Greek Seas. Journal of Cetacean Research and Management 5(3):219-232.

Podestà, Cagnolaro L., Cozzi B. 2005. First record of a stranded Gervais' beaked whale, *Mesoplodon europaeus* (Gervais, 1855), in the Mediterranean waters. Atti della Società Italiana di Scienze Naturali del Museo Civico di Storia Naturale di Milano 146(I):109-116.

van Bree P.J.H. 1975. On the alleged occurrence of *Mesoplodon bidens* (Sowerby, 1804)(Cetacea, Ziphioidea) in the Mediterranean. Annali del Museo Civico di Storia Naturale "Giacomo Doria" 80:226-228.

Harbour porpoise *(Phocoena phocoena)*
Mediterranean Sea (Northern Aegean Sea excepted)

Taxonomy

Family

Phocoenidae

Relevant Common Names

EN	harbour porpoise
FR	marsouin
ES	marsopa común
AR	خنزير البحر الشائع (khinzir albahr achaii)
HR	obalni dupin
EL	φώκαινα (fókaina)
HE	סוסא (pokena)
IT	focena comune
ML	denfil iswed
PT	bôto
TR	mutur

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean (except in the Northern Aegean Sea)

Year compiled

2006

Compiled by:

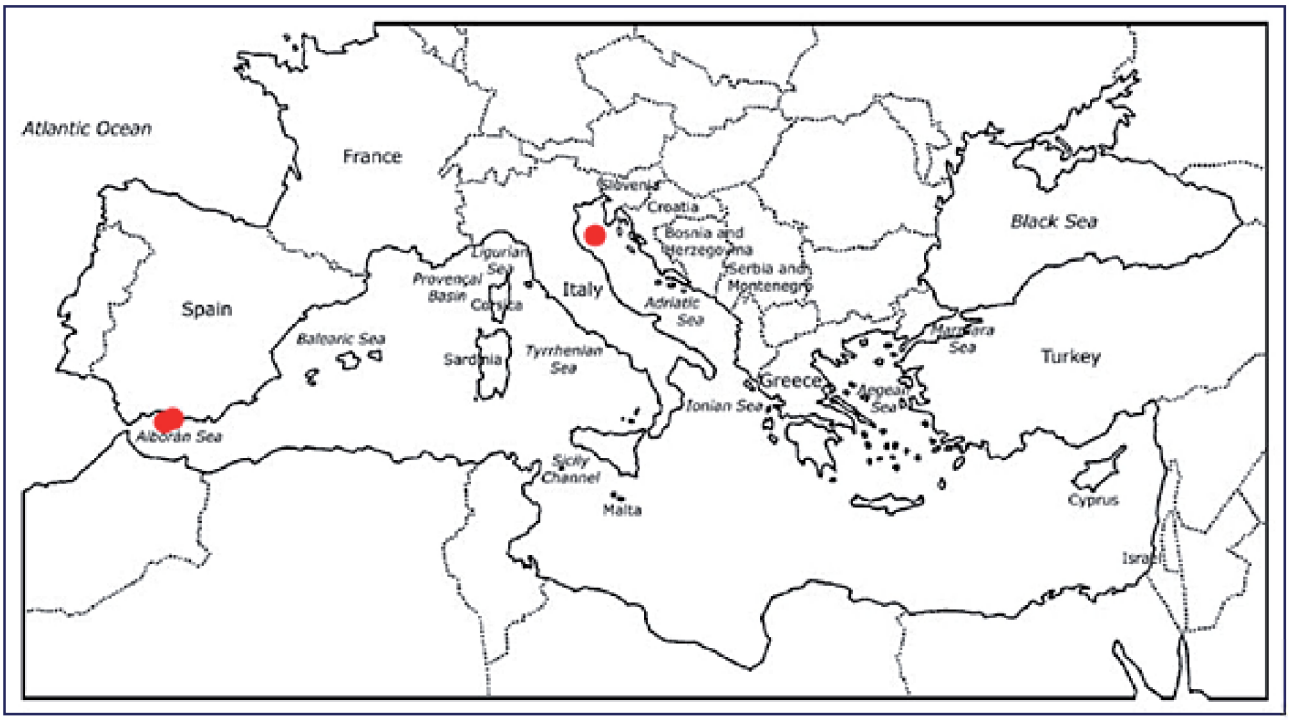
Giuseppe Notarbartolo di Sciara

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania					
Algeria					
Bosnia and Herzegovina					
Croatia					
Cyprus					
Egypt					
France					
Gibraltar (UK)					
Greece					
Israel					
Italy			X		
Lebanon					
Libya					

Malta					
Monaco					
Morocco					
Palestinian Territory					
Serbia and Montenegro					
Slovenia					
Spain			X		
Syria					
Tunisia					
Turkey					



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1822	Adriatic Sea			Cranium in the Museum of comparative anatomy of Bologna, from specimen reportedly caught in the Adriatic Sea	Cagnolaro (1996), citing Alessandrini (1852) concerning the origin of the specimen.
1981 (Oct.)	Playa de Malagueta, Spain	F		Stranding	Frantzis *et al.* 2001 citing Rey and Cendrero 1982
2006 (6 Jul.)	Malaga, Spain	M	165 cm	Stranded alive and died afterwards	Ana Cañadas, pers. comm.

Note: reports from the Mediterranean of harbour porpoises considered doubtful in the review by Frantzis *et al.* (2001) are not listed in the table above, nor marked in the map.

Data Sources

Alessandrini A. 1852. Catalogo del Gabinetto di Anatomia comparata della Pontificia Università di Bologna dalla sua fondazione all'ottobre 1852. Privately published.

Cagnolaro L. 1996. Profilo sistematico e tipologico delle raccolte di cetacei attuali nei musei italiani. Museologia Scientifica 13(Suppl.):193-212.

Frantzis A., Gordon J., Hassidis G., Komnenou A. 2001. The enigma of harbor porpoise presence in the Mediterranean Sea. Marine Mammal Science 17(4):937-944.

Rey J.C., Cendrero O. 1982. Les mammifères marins trouvés sur les côtes espagnoles en 1981. Conseil Intérnational pour l'Exploration de la Mer. ICES Council Meeting 1982/N. 6. 4 pp.

Indo-Pacific humpback dolphin *(Sousa chinensis)*

Taxonomy

Family

Delphinidae

Relevant Common Names

EN	Indo-Pacific humpback dolphin
FR	dauphin à bosse indien
ES	delfin de joroba indopacifico
EL	υβοδέλφινο του Ειρηνικού (yvodélfino tou Eirinikoú)
HE	סוסא (soosa)
IT	susa indopacifica
TR	kambur yunus

Assessment Information

NOT ASSESSED

Status: VAGRANT in the Mediterranean Sea

Year compiled

2006

Compiled by:

Giuseppe Notarbartolo di Sciara

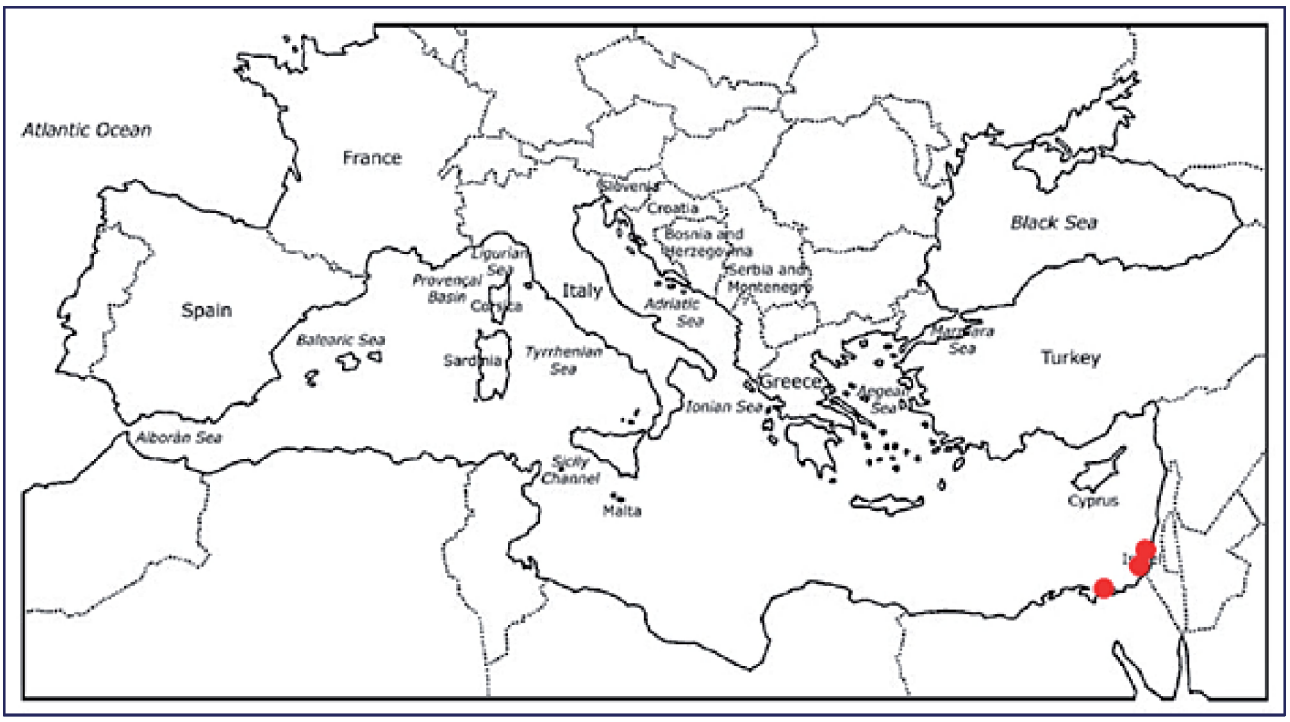
Occurrence

Country Names

Territorial waters of	Regular	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Other
Albania						
Algeria						
Bosnia and Herzegovina						
Croatia						
Cyprus						
Egypt (*)	X	X		X		
France						
Gibraltar (UK)						
Greece						
Israel				X		
Italy						
Lebanon						
Libya						

Malta						
Monaco						
Morocco						
Palestinian Territory						
Serbia and Montenegro						
Slovenia						
Spain				X		
Syria						
Tunisia						
Turkey						

(*) Regular in Egypt in the Red Sea. Visitor in the Suez Canal. Vagrant in Egyptian waters of the Mediterranean Sea.



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
None provided	At entrance of Port Said harbour, Egypt			Sighting	Marchessaux 1980, quoting Mörzer-Bruyns, pers. comm.
2000 (10 Jan.)	Bay of Atlit, Israel			Sighting of one individual	Scheinin et al. 2004
2000 (18 Jan.)	Inside Jaffa harbour, Israel			Sighting of one individual, possibly the same as previous sighting	Scheinin et al. 2004
2000 (20 Jan.)	Inside Ashdod harbour, Israel			Sighting of same individual as previous sighting	Scheinin et al. 2004

Data Sources

Marchessaux D. 1980. A review of the current knowledge of the cetaceans in the Eastern Mediterranean Sea. Vie Marine 2:59-65.

Scheinin A., Kerem D., Goffman O., Spanier E. 2004. Rare occurrences of cetaceans along the Israeli Mediterranean coast. FINS 1(1):19.

Annex 6

Introduced Species

Species	Common name	Sub-region
Delphinapterus leucas	Beluga Whale	Black Sea

Beluga whale *(Delphinapterus leucas)*

Taxonomy

Family

Monodontidae

Relevant Common Names

EN	white whale, beluga
RO	balenă albă
RU	belukha (белуха)
UK	bilukha (білуха)

Assessment Information

NOT ASSESSED

Status: INTRODUCED

Year Compiled

2006

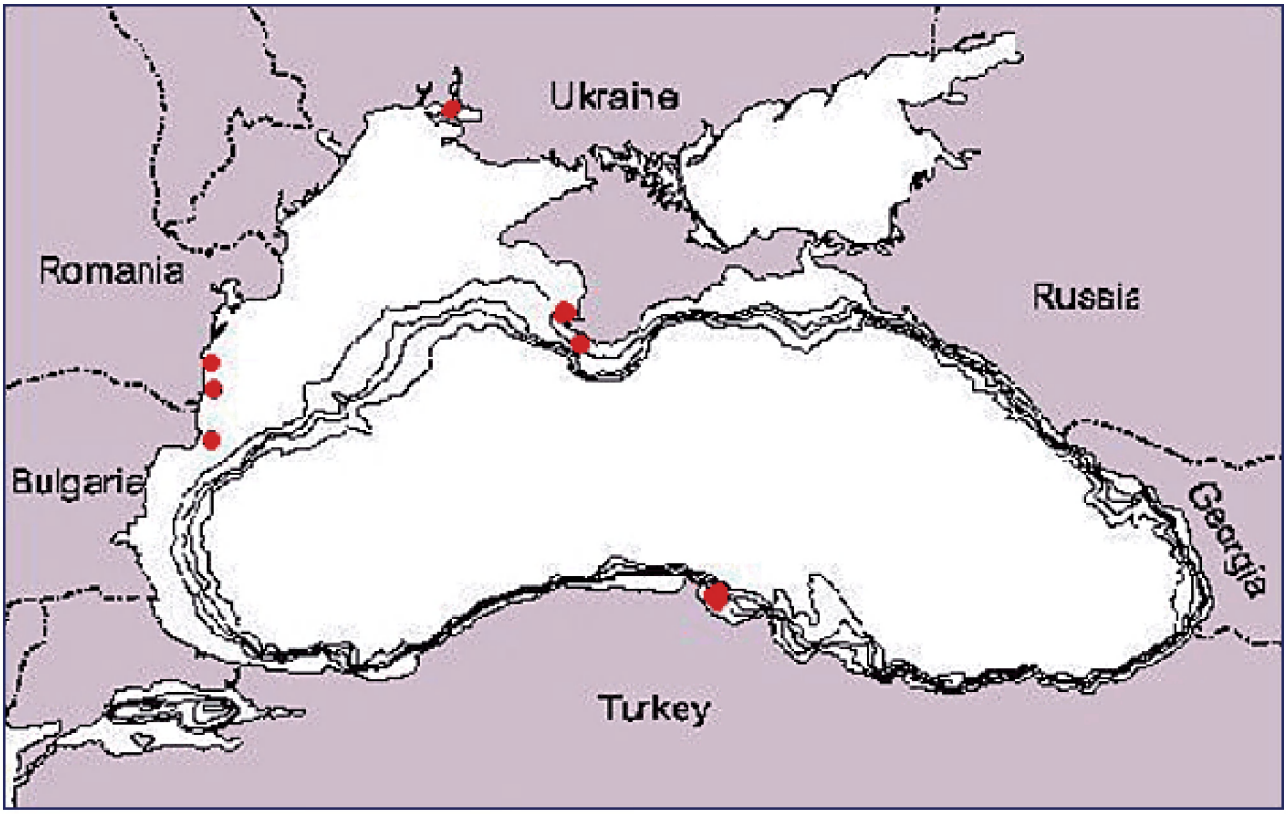
Compiled by

Alexei Birkun, Jr.

Occurrence

Country Names

Territorial waters of	Visitor	Possibly Visitor	Vagrant	Possibly vagrant	Introduced
Bulgaria					X
Georgia					
Romania					X
Russia					
Turkey					X
Ukraine					X



Known occurrences in the region

Date	Location	Sex	Size	Notes	Reference
1991 (Sep.)	Kazachya bay, Crimea, Ukraine	M		Initial escape from captivity	Birkun and Krivokhizhin 1996
1991 (autumn)	Omega bay, Karantinnaya bay and Sevastopol bay, Crimea, Ukraine			Sightings of the same individual	*Ibid.*
1991-92 (cold season)	Gerze, Sinop province, Turkey			Numerous sightings of the same individual	*Ibid.*
1992 (Apr.)	Gerze, Sinop province, Turkey			Capture and transport to Crimea, Ukraine	*Ibid.*
1992 (15 Nov.)	Laspi bay, Crimea, Ukraine			Second escape from captivity of the same individual	*Ibid.*
1992-93 (winter)	Dnieper-and-Boug Liman (firth), Ukraine			Sighting of the same individual	*Ibid.*
1993-94	Southern Black Sea, Turkey			Numerous sightings of the same individual	*Ibid.*
1994 (Jun.)	Agigea harbour, areas near Cape Midia, Costinesti and offshore oil drilling platforms, Romania			A few sightings and ineffective attempts to catch the same individual	Plotoaga and Stanciu 1995
1994-95 (winter)	Western Black Sea, Bulgaria			Sightings of the same individual near oil platform	Birkun and Krivokhizhin 1996

Note: This information concerns one individual that originated from the Sea of Okhotsk. It was captured in Sakhalin Bay near Baidukov island, Russia, in July 1987 and was maintained in an open-air net-cage for four years before its transferral to Crimea, Ukraine. Almost immediately upon its arrival there (i.e. on the same day) it was released (or escaped) into the Black Sea. Another male beluga that was released (or escaped) at the same time and place was also observed and reported in the wild several times, but only in the vicinity of Sevastopol and within the first few weeks after the release (escape) event.

Data Sources

Birkun A.A., Jr., Krivokhizhin S.V. 1996. Mammals of the Black Sea. Tavria, Simferopol, 96 pp. (In Russian).

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Annex 7

2003 Assessment
Short-beaked Common Dolphin *(Delphinus delphis)*
(Mediterranean subpopulation)*

Taxonomy

Kingdom

ANIMALIA

Phylum

CHORDATA

Class

MAMMALIA

Order

CETACEA

Family

DELPHINIDAE

Relevant Common Names

EN	SHORT-BEAKED COMMON DOLPHIN
FR	DAUPHIN COMMUN
ES	DELFÍN COMÚN

Species Authority

Linnaeus, 1758

Assessment Information

Red List Category & Criteria

EN A2abc ver 3.1 (2001)

Year Assessed

2003

Assessor/s

Bearzi, G.

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* Can be accessed at http://www.iucnredlist.org/search/details.php/41762/all

Evaluator/s

Reeves, R.R. & Taylor, B. (Cetacean Red List Authority)

Justification

At the outset, it is necessary to acknowledge that definitive quantitative data on absolute abundance and rate and extent of decline are not available for this subpopulation, and that it is unlikely that such data will become available in the near future. The Preamble of the 2001 IUCN Red List Categories, under Item 6, states that "the absence of high-quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasized as being acceptable throughout - so long as these can reasonably be supported." The abundant qualitative data and limited quantitative data that are available for the Mediterranean subpopulation of Common Dolphins are sufficient to infer a reduction in population size of more than 50% over a three-generation period (i.e., the past 30-45 years). [Note: Estimated age at sexual maturation varies with region, from three years (Black Sea) to 7-12 years (eastern Pacific) for males and from 2-4 years (Black Sea) to 6-7 years (eastern Pacific) for females (Perrin 2002). Variation between regions may be partly a result of density-dependent effects due to exploitation. Maximum estimated age is 22 years (Black Sea). These values support an estimate of generation time of 10-15 years.] The reduction or its causes may not have ceased, are not understood, and may not be reversible. These inferences are based on the expert judgment of researchers from the region who have observed declines in the number of animals (subcriterion a) and in the subpopulation's extent of occurrence, as well as a deterioration in the quality of Common Dolphin habitat in large portions of the Mediterranean (subcriterion c). Although no formal index of abundance (subcriterion b) is available to demonstrate a numerical decline, there is reason to believe that such a decline has occurred, based on the species' progressive disappearance from the Adriatic, Balearic, and Ligurian Seas and Provençal Basin, the significant decline in group encounter rates in the eastern Ionian Sea (see documentation under Range and Population), and the reasonable assumption that a decline in abundance has been commensurate with the large (albeit unquantified) decline in extent of occurrence. For additional detail, readers are referred to Bearzi *et al*. (2003).

Consultation and peer review:

This assessment and the supporting documentation was drafted by Giovanni Bearzi in consultation with Ana Cañadas, Alexandros Frantzis, Giuseppe Notarbartolo di Sciara, Elena Politi, Randall Reeves, and Barbara Taylor. It was reviewed by the CSG membership prior to submission to IUCN.

Distribution

Country Names

Albania
Algeria
Bosnia and Herzegovina
Croatia
Cyprus
Egypt
France
Gibraltar (UK)
Greece
Israel
Italy
Lebanon
Libya
Malta
Monaco
Morocco
Palestinian Territory
Serbia and Montenegro

Slovenia
Spain
Syria
Tunisia
Turkey

Aquatic Regions

Mediterranean and Black Sea

Summary Documentation

System

Marine

Major Habitat(s)

9.1 Sea - Open
9.2 Sea - Shallow

Major Threat(s)

1.3.2.3 Habitat Loss/Degradation - Extraction - Fisheries - Large-scale/industrial (past)
4.1.1.2 Accidental mortality - Bycatch - Fisheries-related - Netting (past, present)
6.1.1 Pollution (affecting habitat and/or species) - Atmospheric pollution - Global warming/oceanic warming (present, future)
6.3 Pollution (affecting habitat and/or species) - Water pollution (ongoing)
8.3 Changes in native species dynamics - Prey/food base (past, present)

Population Trend

Conservation Action(s)

1.1.1 Policy-based actions - Management plans - Development (needed)
1.2.1.1 Policy-based actions - Legislation - Development - International level (in place)
1.2.1.2 Policy-based actions - Legislation - Development - National level (in place)
2.2 Communication and Education - Awareness (needed)
3.5 Research actions - Threats (needed)
3.9 Research actions - Trends/Monitoring (needed)
4.4.2 Habitat and site-based actions - Protected areas - Establishment (in place, needed)

Detailed Documentation

Range

The Short-beaked Common Dolphin (hereafter the Common Dolphin) is a small cetacean species with a wide distribution. Like most other cetaceans, however, it is not panmictic and occurs as a series of geographically separate subpopulations (e.g., Jefferson and Van Waerebeek 2002). Once one of the commonest species in the Mediterranean Sea, the Common Dolphin has experienced a generalized and major decrease in this region during the last 30-40 years (Bearzi *et al*. 2003). Coastal groups in western Greece seem to exhibit relatively high levels of site fidelity (Politi 1998), but little is known about the movements and ranging patterns of animals living offshore.

The case for regarding Mediterranean Common Dolphins as a distinct subpopulation is not perfect, and admittedly rests upon a somewhat complicated chain of inference. Genetic studies indicate a significant level of divergence between Mediterranean and Atlantic populations (Natoli *et al*. in press). Differences in contaminant levels between dolphins from the Alboràn Sea (northwestern Mediterranean) and Atlantic

Ocean also suggest a certain degree of isolation. Organochlorine concentrations in Alboràn Sea dolphins were about double those typical of dolphins in neighboring North Atlantic waters and showed a completely different profile (proportions between PCB congeners, the DDE/tDDT ratio, etc.) (Borrell *et al*. 2001). Genetic exchange between Common Dolphins from the Mediterranean Sea and Atlantic Ocean, to the extent that it occurs, appears to involve only animals from the Alboràn Sea (Natoli *et al*. in press), possibly due to oceanographic features such as the Almería-Orán thermohaline front.

At the eastern end of the Mediterranean, there is little indication of movement by Common Dolphins through the narrow Dardanelles Strait between the Aegean and the Marmara and Black Seas, where Common Dolphins are known to occur (Öztürk and Öztürk 1997, Frantzis *et al*. submitted). A preliminary study of skull morphometrics (Amaha 1994) suggested differences between Black Sea and Mediterranean Common Dolphins. In contrast, a genetic comparison of relatively small samples (8 Black Sea, 20 central Mediterranean) revealed no significant differences (Natoli *et al*. in press). Clearly, further work based on larger samples is needed to assess and characterize the relationship between Black Sea and Mediterranean Common Dolphins. It is acknowledged that some genetic exchange might occur in portions of the Aegean Sea where favorable habitat still exists (e.g., in the Thracian Sea; Frantzis *et al*. submitted). However, what remains between the Aegean and Alboràn sectors of the Mediterranean seems to be only isolated, remnant groups (possibly indicative of further population substructure). The once-large aggregate Mediterranean subpopulation is now a small fraction of what it was as recently as the middle of the twentieth century (Bearzi *et al*. 2003). One note of caution is that there has been relatively little survey coverage of waters along the North African coast.

Population

Literature and osteological collections unambiguously confirm that Common Dolphins were widespread and abundant in much of the Mediterranean Sea until the late 1960s, and that their decline occurred relatively quickly (Bearzi *et al*. 2003; and see references contained therein). Today, Common Dolphins remain relatively abundant in the westernmost portion of the basin, the Alboràn Sea. There are sparse records off the coast of Algeria where, however, survey coverage has been limited. Possibly isolated groups are present around Sardinia and Corsica, particularly off their western coasts (Bearzi *et al*. 2003). Common Dolphins are seen in the early summer in the south-eastern Tyrrhenian Sea off the island of Ischia (Mussi *et al*. in press). The species is also present in the Sicily Channel, with larger groups being observed around Malta (Vella in press). Common Dolphins can be found in portions of the eastern Ionian Sea, particularly around the island of Kalamos (Politi and Bearzi in press), and in the Gulf of Corinth (Frantzis and Herzing 2002). Sighting and stranding data indicate a regular presence of Common Dolphins in the Aegean Sea, particularly in the Thracian Sea, Northern Sporades, the southern Evvoikos Gulf, the Saronic Gulf, and the Dodekanese (Frantzis *et al*. submitted). Otherwise, these dolphins are rare in, or completely absent from, Mediterranean areas where information is available (Bearzi *et al*. 2003). Mediterranean regions where Common Dolphins have apparently vanished include the Adriatic Sea, Balearic Sea, Provençal basin, and Ligurian Sea.

There is no basin-wide estimate of abundance for Common Dolphins in the Mediterranean Sea. Line-transect ship surveys of the Alboràn Sea in 1991-1992 produced an estimate of 14,736 (CV=0.38; 95% CI=6,923-31,366), with a density of 0.16 dolphins per km², but no estimates were made for this species elsewhere in the western Mediterranean due to the low number of sightings (Forcada and Hammond 1998). Vella (in press) combined data from ship and aerial surveys conducted between 1997-2002, and obtained a density estimate of 0.135 dolphins per km² (CV=0.28; 95% CI=0.066-0.290) in the area around the Maltese islands. Around the island of Kalamos in the eastern Ionian Sea, the mean sighting frequency was 0.016 groups per km (or 0.11 dolphins per km) in the years 1993-2000, but in 2001-2002 there was a significant decrease to 0.007 groups per km (or 0.04 dolphins per km) (Student's $t=4.88$, $p<0.001$). The number of individuals encountered in this area has decreased continually, and many individuals that used to be seen regularly until 1996 have disappeared (Bearzi *et al*. 2003).

Habitat and Ecology

In the Mediterranean, Common Dolphins are found in both pelagic and neritic environments, occasionally sharing the former with Striped Dolphins (*Stenella coeruleoalba*) and the latter with Common Bottlenose Dolphins (*Tursiops truncates*) (Bearzi *et al*. 2003). Mixed-species groups of Common, Striped and Risso's Dolphins (*Grampus griseus*) have been consistently observed in the pelagic waters of the Gulf of Corinth, Greece (Frantzis and Herzing 2002). Mediterranean Common Dolphins are typically found in groups of 50-70 animals, with larger aggregations occasionally recorded. In the eastern Ionian Sea coastal waters,

however, groups rarely include more than 15 individuals, and groups greater than 40 have not been observed (Bearzi *et al*. 2003).

Threats

A number of factors may have contributed, singly or in synergy, to the decline of Common Dolphins in the Mediterranean (Bearzi *et al*. 2003). Mediterranean biodiversity is undergoing rapid alteration under the combined pressure of human impact and climate change (Bianchi and Morri 2000), and it is difficult to discriminate between the effects of environmental shifts due to climate change, whether "natural" or a result of the greenhouse effect, and other factors that may be affecting the availability of dolphin prey, such as overfishing and habitat degradation. In all Mediterranean areas where Common Dolphins have been studied consistently, namely the Alboràn Sea, southeastern Tyrrhenian Sea, and eastern Ionian Sea, competition with fisheries is a source of concern (Notarbartolo di Sciara *et al*. 2002, Bearzi *et al*. 2003) although cause-effect relationships and ecosystem dynamics remain poorly characterized. The role of xenobiotic contamination is controversial but likely significant. High levels of PCBs in Mediterranean dolphins, compared to levels in dolphins from other areas (Fossi *et al*. 2000, Aguilar *et al*. 2002), represent a major concern because of the possibilities of immune suppression and reproductive impairment. The high PCB levels in Common Dolphins from the Alboràn Sea are close to the range at which adverse effects could be expected, based on extrapolation from other species (Borrell *et al*. 2001). Fossi *et al*. (2000, in press) found a significant correlation between mixed-function oxidase activity and organochlorine levels in Common Dolphin skin biopsies, suggestive of exposure to endocrine-disrupting chemicals and potential for transgenerational effects. The cumulative importance of these threats and other factors, including incidental mortality in fishing gear (below), is poorly understood.

Fishery bycatch is a major threat to many cetacean populations, and it could well have played a role in the decline of Common Dolphins in at least some Mediterranean areas (IWC 1994). In the Alboràn Sea, for example, drift gillnets are known to have caught a few hundred Common Dolphins per year (Silvani *et al*. 1999). This fishery has stopped, but it operated for many years and undoubtedly had some impact on the population. If drift nets were taking Common Dolphins in the Alboràn Sea, it is reasonable to assume that they were (and are) doing so in other parts of the Mediterranean where drift net fishing and Common Dolphin occurrence overlap. Bearzi *et al*. (2003) suggest that bycatch alone is unlikely to be the factor most responsible for the decline of Common Dolphins in the Mediterranean, but it may have played a significant role at certain times and in certain areas.

The possibility that the Striped Dolphin has been increasing in the Mediterranean and has begun to occupy the ecological niche of the Common Dolphin has been discussed in the literature (Viale 1985, Aguilar 2000, Bearzi *et al*. 2003). Such a hypothesis is extremely difficult to prove or disprove, particularly if invoked as a causal factor in the Common Dolphin's decline. Even if it were true that Striped Dolphins have been extending their range to inshore waters traditionally inhabited by Common Dolphins, it would be unclear whether this process was being driven by competitive exclusion, or was instead a secondary outcome of the Common Dolphin's disappearance for some other reason. In any event, competition would not be an issue in areas such as the northern Adriatic Sea, where the Common Dolphin has disappeared while the Striped Dolphin rarely occurs.

Conservation Measures

A large Marine Sanctuary for cetaceans in the Corso-Ligurian Basin has been declared by the Governments of Italy, France and Monaco. Other smaller marine protected areas exist or have been proposed throughout the Mediterranean Sea (Bearzi *et al*. 2003). In 1999, the Spanish Ministry for the Environment included the Common Dolphin in its National Endangered Species Act as "vulnerable". The following year, a program was initiated to identify important areas for the conservation of cetaceans in the Spanish Mediterranean with the aim of implementing the European Union's "Habitats" Directive, the Barcelona Convention and the Bonn Convention (Convention on Migratory Species, or CMS) through the creation of marine protected areas. Based on the presence of a relict group of Common Dolphins, the eastern Ionian area around the island of Kalamos has been included by the Greek Ministry of the Environment in the Natura 2000 network ("Site of Community Importance") under the 9243 EEC "Habitats" Directive. While these types of designations may benefit Common Dolphins at least indirectly, measures to provide direct benefits, e.g., area-, season-, or fishery-specific reductions in fishing effort, curtailment of inputs of particular pollutants, etc., remain to be identified and implemented. The Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS 2002) considers the Mediterranean Common Dolphin as an endangered population. It is

expected that efforts to increase understanding of ongoing threats, monitor status, and provide needed protective measures on behalf of the dolphins and their habitat will be organized and implemented through ACCOBAMS.

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Annex 8

Species reported to have occurred but that have not, or probably have not, occurred in the Mediterranean

Year compiled

2006

Compiled by

Giuseppe Notarbartolo di Sciara

Species	Notes	Reference
Balaenoptera musculus	*B. musculus* 'auctorum' (*nec* L. 1758) often erroneously applied to fin whales, *Balaenoptera physalus*, in the Mediterranean. Blue whales were never confirmed in the region, although specimens were caught in the Strait of Gibraltar in the 1950s.	Bompar 2000, Notarbartolo di Sciara et al. 2003
Feresa attenuata	Listed among the species occurring in the Mediterranean in Section 5 ("List of Species by Major Marine Fishing Areas", p. 305), no source provided.	Jefferson et al. 1993
Globicephala macrorhynchus	Listed among the species occurring in the Mediterranean in Section 5 ("List of Species by Major Marine Fishing Areas", p. 305), no source provided.	Jefferson et al. 1993
Lagenorhynchus acutus	The occurrence of the species in the Adriatic Sea, first reported by Dathe (1934), was later found by the same author (1972) to be based on a misidentification. Undocumented reports in 1990 from the Strait of Gibraltar (Hashmi and Adloff 1991) remain doubtful.	Dathe 1934, 1972, Van Bree 1975, Hashmi and Adloff 1991
Lagenorhynchus albirostris	Undocumented sighting reported off Antalya, Turkey, by non-specialists. Undocumented reports in 1987 from the Strait of Gibraltar (Hashmi and Adloff 1991) remain doubtful.	Hennipman et al. 1966, Hashmi and Adloff 1991
Monodon monoceros	Undocumented, dubious stranding in Corsica in August 1960, reported by Viale (1985)	Dhermain 2004
Stenella frontalis	Undocumented sighting made in 1982 by non-specialists near Minorca, Spain, of a group of three dolphins said to have "the side of the head light gray, distinct cape on top of the head, grayish-white spots on the dorsal portion of the body", reported by Di Natale (1983)	Bompar 2000

Data Sources

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