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Physeter macrocephalus (Mediterranean subpopulation), Sperm Whale

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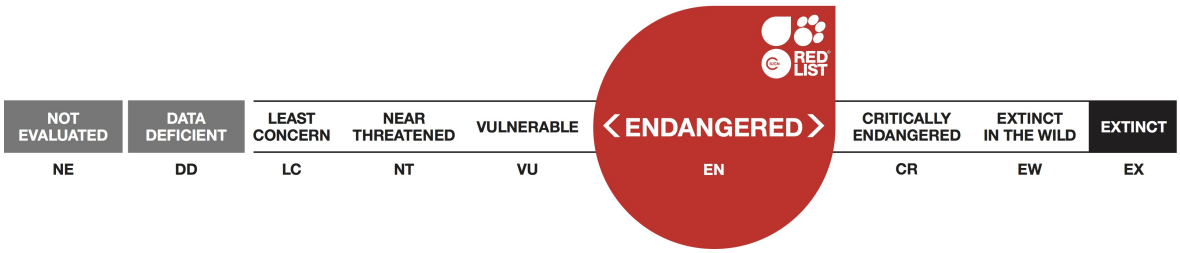

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Cetartiodactyla	Physeteridae

Taxon Name: *Physeter macrocephalus (Mediterranean subpopulation)* Linnaeus, 1758

Parent Species: See *Physeter macrocephalus*

Common Name(s):

- English: Sperm Whale
- French: Cachalot
- Spanish: Cachalote

Taxonomic Notes:

Also known as *Physeter catodon* Linnaeus, 1758. 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.

Assessment Information

Red List Category & Criteria: Endangered C2a(ii) ver 3.1

Year Published: 2012

Date Assessed: September 27, 2006

Justification:

The Mediterranean Sperm Whale subpopulation is here assessed as EN C2a(ii). As explained below, this listing is based on inference leading to the following assumptions:
1. The Mediterranean subpopulation, which is genetically distinct, contains fewer than 2,500 mature individuals; 2. The subpopulation experiences an inferred 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 subpopulation, some data are available for limited areas within the region. Lewis *et al*. (2007) estimated overall abundance of sperm whales in the Ionian Sea to be 62 animals (95% CI = 24–165), and zero animals in the Strait of Sicily. By contrast, 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 (Lewis *et al.* 2007). This suggests that Sperm Whale numbers are higher in the western basin than in the Ionian Sea; however, considering that the overall surveyed area by Lewis *et al.* (2007) is a large portion of the Sperm Whale habitat in the Mediterranean, and that recent surveys made in the remaining portion have not revealed the existence of very high concentrations of sperm whales there (Song of the Whale Team – IFAW 2007), it is suggested that overall Sperm Whale numbers in the Mediterranean are likely to be only in the low to mid hundreds. Concerning the number of mature individuals, if data from the Hellenic Trench (see the 'Population' section) can be extrapolated to the entire region, only 45% of the total present-day

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Mediterranean subpopulation 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, still extensively used in the central and eastern Mediterranean, whether legally or illegally) 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 a decline (of unknown magnitude) over the last half-century and it is inferred that, in the absence of effective management to mitigate the ongoing threats, the population decline is continuing.

3. Genetic data from a sample of Sperm Whales across the Mediterranean have not provided evidence for within-region population structure (Drouot *et al.* 2004a; Engelhaupt *et al*. 2009). 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.

Geographic Range

Range Description:

In the Mediterranean Sea, Sperm Whales are widely distributed from the Gibraltar Strait area in the west to the Levant Basin in the east. The species was 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. It is still fairly predictable in the Gibraltar Strait, near the Balearic Islands and along the Hellenic Trench from the NE Ionian Sea to the NW Levant Basin. The species is rare in the Strait of Sicily, and vagrant in the northern and central Adriatic Sea. It is absent from the Black and Marmara seas.

Country Occurrence:

Native: Albania; Algeria; Cyprus; Egypt; France; Gibraltar; Greece; Italy; Libya; Malta; Monaco; Morocco; Spain; Tunisia; Turkey

FAO Marine Fishing Areas:

Native: Mediterranean and Black Sea -

Population

Population size

Genetic data suggest that Sperm Whales in the Mediterranean constitute a separate subpopulation. 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 *et al*. (2009) compared a sample of 44 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 that the Mediterranean is home to a philopatric population of matrifocal social groups, from which males disperse (Engelhaupt *et al*. 2009). This is consistent with the frequent observations of the same groups of Sperm Whales in the Gibraltar Strait (Fernandez-Casado *et al*. 2004, de Stephanis *et al*. 2005), which could be primarily mature males. Other types of observations are suggestive of geographic 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 and Würtz 2005) confirms that calving takes place there. In the eastern Mediterranean, both social groups and solitary adult males are present year-round. In other parts of the basin social groups with calves seem to be rather infrequent, with the exception of the Balearic Islands (Rendell and Cañadas 2005), 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 and Gannier 1999), 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). More than 50% of codas produced by Mediterranean solitary males are “3+1” codas (Frantzis and Alexiadou 2008).

No estimate of population size exists for the region. 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. Estimated abundance for the Ionian Sea in 2003, based on surveys combining visual and acoustic techniques, was 62 individuals (95% CI = 24–165; Lewis *et al*. 2007). These results are consistent with the number of Sperm Whales photo-identified along the Hellenic Trench (see below), which lies in part within the area surveyed by Lewis *et al*. (2007), and in part further to the east. Ssperm Whales were detected on-transect during a survey of the Strait of Sicily (Lewis *et al*. 2007). 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 (Lewis *et al*. 2007). This suggests that Sperm Whale numbers are higher in the western basin than in the Ionian Sea; however, considering that the overall surveyed area by Lewis *et al*. (2007) is a large portion of the Sperm Whale habitat in the Mediterranean, and that recent surveys made in the remaining portion have not revealed the existence of very high concentrations of Sperm Whales there (Song of the Whale Team – IFAW 2007), it is suggested that overall Sperm Whale numbers in the Mediterranean are likely to be only in the low to

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mid hundreds. About 50 individuals have been photo-identified in the western Mediterranean Sea up to 2004 (NAMSC 2004). About 170 individuals (28 solitary males and 15 social units) have been photo-identified along the Hellenic Trench during 12 years of intense research effort (1998–2009). In this particular area the first estimates by capture-recapture models indicate about 200 Sperm Whales (A. Frantzis, unpublished data). This number refers to the population that uses the Hellenic Trench, including animals that are regularly observed there and animals that are occasional visitors (especially males). In the Ligurian Sea, known to contain one of the most productive pelagic areas in the Mediterranean, 70 Sperm Whales have been photo-identified across 14 years (1995–2008) of intensive research, suggesting that density there is low. In the Strait of Gibraltar 21 individuals were identified (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 (D. Engelhaupt, pers. comm. to GNS).

Population trend

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 inconsistent with the impression given by historical records (Bolognari 1949, 1950, 1951, 1957). For example, in the waters adjacent to the northern and eastern coasts of Sicily, an intensive year-long programme of dedicated surveys in the Strait of Messina and surrounding waters, based on a combination of visual and acoustic techniques (Notarbartolo di Sciara *et al*. 2006), produced 11 Sperm Whale sightings (totalling 15 individuals), all of them in winter, during 125 survey days spanning 12 months.

Sperm Whales have declined considerably in the stranding records of Italy in the last decade, in stark contrast with the large numbers of individuals in the records in the 1987–1998 period (see also the “Threats” section), and in spite of the fact that efficiency of discovery and reporting of strandings has greatly improved over time in Italy (Notarbartolo di Sciara *et al*. 2004). In those years Italy had the largest driftnet fleet in the Mediterranean (in excess of 700 vessels) operating throughout a significant portion of the central basin (Scovazzi 1998). An organised nation-wide effort to document stranded, floating dead and entangled cetaceans began in Italy 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 (i.e., ≥2 individuals) of Sperm Whales are known in the Mediterranean, but infrequent. These include a stranding of 12 individuals near Mazara del Vallo, Sicily, in 1734, reported by Antonino Mongitore in 1743 (Parona, 1897); a group of three in the harbour of Sant'Elpidio, northern Adriatic Sea, in 1805 (Parona, 1897); five juveniles stranded near Pozzallo, south-eastern Sicily, in 1873 (Parona, 1897); six near Novigrad, northern Adriatic Sea, in 1853 (Heckel, 1853); seven near Ugento, Ionian Sea, in 1887 (Parona, 1897); seven reported from Marsala, Sicily, by Giuseppe Riggio in 1892 (Notarbartolo di Sciara and Bearzi 2004); seven near Marzocca di Senigallia, northern Adriatic Sea, in 1938 (unpublished); and seven near Foce Varano, southern Adriatic Sea, in 2009 (unpublished data).

Current Population Trend: Decreasing

Habitat and Ecology **(see Appendix for additional information)**

Preferred Sperm Whale habitat in the Mediterranean consists mostly of deep continental slope waters where mesopelagic cephalopods, the species' preferred prey, are most abundant (Azzellino *et al*. 2008, Praca and Gannier 2008). Deeper offshore waters are also inhabited, but perhaps to a lesser degree (Praca and Gannier 2008).

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*. 2004b), although the latter may be found occasionally in the north as well (Moulins and Würtz 2005, Di Meglio and David 2008, Pierantonio *et al*. 2008). In some parts of the eastern basin, social groups 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 groups are present and large males are rarely seen. When large males are present, it is almost always in a reproductive context. Social groups typically consist of 10–12 individuals including at least 1–2 calves (Gannier *et al*. 2002).

Based on a combination of photo-identification and acoustic data, Drouot-Dulau and Gannier (2007) observed north–south movements of sexually mature males between the northern Mediterranean and social groups off the Balearic Islands, ranging in excess of 500 km and lasting seven days or less. Laran and Drouot-Dulau (2007) observed the highest abundance of sperm whales in the Ligurian Sea between August and October, which is indicative of the species' movement within a wider area. In the eastern Mediterranean, both solitary males and social groups 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 (A. Frantzis, unpublished data). Some solitary males and several social units have been re-sighted in the same area for up to three and six consecutive years, respectively, during ongoing long-term studies (Frantzis *et al*. 2003; A. Frantzis, unpublished data). Information on the reproductive behaviour and ecology of sperm whales in the Mediterranean remains sparse. Both solitary males and social groups of sperm whales are thought to feed throughout their range; short, apparently reproductive associations of mature males with social units have been observed in the Ionian Sea, as well as very young newborns and a birth (A. Frantzis, unpublished data).

Systems: Marine

Threats (see Appendix for additional information)

The most likely threat to Sperm Whales in the Mediterranean is entanglement in high-seas swordfish and tuna driftnets, which has caused considerable and likely unsustainable mortality since the mid-1980s, when this type of fishery started to be used on a large scale (Notarbartolo di Sciara 1990; International Whaling Commission 1994). Such mortality is ongoing (Tudela *et al.* 2003, ACCOBAMS 2003, Pace *et al.* 2005, Italian Cetacean Stranding Database). The recorded number of Sperm Whales found dead or entangled between 1971 and 2004 in Spain, France and Italy (combined) was 229, only 22 of which (10%) occurred between 1971 and 1986, when the Italian stranding program started, and there is no reason to believe that documentation was anywhere near complete. Most 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 and Magnaghi 1989, Lazaro and Martin 1999). Cagnolaro and 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 has been continuing in Sperm Whale habitat, not only in the western Mediterranean (e.g., in France, Italy, and Morocco; Oceana 2007) but recently also in the eastern basin (e.g., Greece and Turkey; Akyol *et al*. 2005), 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, disturbance from intense marine traffic (e.g., the development of 'highways of the sea') and collisions with large vessels (e.g. cargo ships, tankers, hydrofoils and high-speed ferries; de Stephanis *et al.* 2003, 2005), may be a significant source of mortality. More than 6% of 111 Sperm Whales stranded in Italy (1986–1999) and Greece (1982–2001) have died after being struck by a vessel, and 6% of 61 photo-identified individuals (39 in Greece and 22 in Italy) bore wounds or scars caused by a vessel strike (Pesante *et al.* 2002). Underwater noise from oil and gas prospecting (seismic airguns), military operations, and illegal dynamite fishing are other sources of concern (Notarbartolo di Sciara and Gordon 1997). At least in summer, seismic surveys have occurred along the Hellenic Trench since 2004 and on a daily basis since 2007 (A. Frantzis, unpublished data). Dynamite fishing is still a common activity in large portions of the eastern and southern Mediterranean, where feeding and socialising Sperm Whales are present year-round (Frantzis *et al*. 2003).

Conservation Actions (see Appendix for additional information)

An international sanctuary for the conservation of Mediterranean cetaceans, where driftnet fishing was progressively phased out, was established in 1999, encompassing key cetacean habitat in portions of the Provençal, Corsican, Ligurian, Tyrrhenian and northern Sardinian Seas (Notarbartolo di Sciara *et al*. 2008). 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.

For the specific purpose of reducing the risk of collisions between Sperm Whales and vessels, the only management measure currently taken in the Mediterranean Sea is the "Notice to Mariners to protect cetaceans from the risk of ship collisions in the Strait of Gibraltar", published in January 2007 by the "Instituto Hidrográfico de la Marina" (Ministry of Defense, Spain). This Notice establishes a security area characterized by high densities of Sperm Whales, where crossing ships are urged to limit their speed to 13 knots or slower (following the suggestions by Laist *et al*. 2001) and to navigate with particular caution. The same notice is broadcast regularly by VHF radio from April to August and it is included in the Nautical Charts (Tejedor *et al*. 2008).

Credits

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Bibliography

ACCOBAMS. 2003. *Recommendation 2.2 from the Scientific Committee "on pelagic gillnets in the ACCOBAMS area", adopted in Istanbul*.

Akyol O., Erdem M., Unal V., Ceyhan T. 2005. Investigations on drift-net fishery for swordfish (Xiphias gladius L.) in the Aegean Sea. *Turkish Journal of Veterinary and Animal Science* 29: 1225-1231.

Azzellino, A, Gaspari, S., Airoldi, S. and Nani, B. 2008. Habitat use and preferences of cetaceans along the continental slope and the adjacent pelagic waters in the western Ligurian Sea. *Deep-Sea Research Part I* 55: 296-323.

Bolognari A. 1949. A proposito della recente cattura di alcuni esemplari di capodoglio (Physeter macrocephalus L.) nel Mediterraneo. *Bull. Inst. Ocean. Monaco* 949: 1-43.

Bolognari A. 1950. Ancora sulla comparsa del capodoglio (Physeter macrocephalus L.) nel Mediterraneo. *Bollettino di Zoologia* 17: 29-37.

Bolognari A. 1951. La migrazione del capodoglio nel Mediterraneo. *Bollettino di Zoologia* 18: 253-256.

Bolognari A. 1957. Sulla biologia del capodoglio. *Atti della Società Peloritana di Scienze Fisiche, Matematiche e Naturali* 3(2): 143-156.

Borsani J.F., G. Pavan, J.G.C. Gordon & G. Notarbartolo di Sciara. 1997. Regional vocalisations of the sperm whale: Mediterranean codas. *European Research on Cetaceans* 78-81: 78-81.

Cagnolaro, L. and Notarbartolo di Sciara, G. 1992. Attivitá di ricerca sui cetacei e loro status di conservazione in Italia. *Bollettino del Museo Istituto di Biologia della Universita Genova* 56–57: 53–85.

de Stephanis R., Salazar Sierra J., Perez Gimeno N., Verborgh P., Tellez E., Rueda L. 2003. Collision between a ferry and a sperm whale (Physeter macrocephalus) in the Strait of Gibraltar. 17th Conference of the European Cetacean Society: 150.

de Stephanis R., Verborgh, P., Pérez Gimeno, N., Sánchez Cabanes, A., Pérez Jorge, S., Esteban Pavo, R., Séller, N., Urquiola, E., Guinet, C. 2005. *Impactos producidos por el tráfico marítimo en las poblaciones de cetáceos en el estrecho de Gibraltar. Situación actual y previsiones de futuro*. Dirección General para la Biodiversidad del Ministerio de Medio Ambiente.

de Stpehanis R., Verborgh, P., Pérez Gimeno, N., Sánchez Cabanes, A., Pérez Jorge, S., Esteban Pavo, R., Séller, N., Urquiola, E., Guinet, C. 2005. *Impactos producidos por el tráfico marítimo en las poblaciones de cetáceos en el estrecho de Gibraltar. Situación actual y previsiones de futuro*. Dirección General para la Biodiversidad del Ministerio de Medio Ambiente.

Di-Meglio N., David L. 2008. A particular year or the symptom of a global change in the distribution of large cetaceans in the northwestern Mediterranean Sea? 22Nd Annual Conference of the European Cetacean Society. Egmond aan Zee, The Netherlands.

Drouot-Dulau V., Gannier A. 2007. Movements of sperm whale in the western Mediterranean Sea: preliminary photo-identification results. *Journal of the Marine Biological Association of the United Kingdom* 87: 195-200.

Drouot, V., Berube, M., Gannier, A., Goold, J. C., Reid, R. J. and Palsboll, P. J. 2004. A note on genetic isolation of Mediterranean sperm whales (*Physeter macrocephalus*) suggested by mitochondrial DNA. *Journal of Cetacean Research and Management* 6(1): 29-32.

Drouot V., Gannier A., Goold J.C. 2004. Summer social distribution of sperm whales (Physeter

macrocephalus) in the Mediterranean Sea. *Journal of the marine Biological Association of the United Kingdom* 84(3): 675-680.

Drouot V., Gannier A., New sperm whale vocalisations recorded in the Mediterranean Sea. European Research on Cetaceans - 13. Proc. 13th Ann. Conf. ECS: 30-32. Valencia.

Engelhaupt D., Hoelzel A.R., Nicholson C., Frantzis A., Mesnick S., Gero S., Whitehead H., Rendell L., Miller P., de Stefanis R., Canadas A., Airoldi S., Mignucci-Giannoni A. 2009. Female philopatry in coastal basins and male dispersion across the North Atlantic in a highly mobile marine species, the sperm whale (Physeter macrocephalus). *Molecular Ecology* 18: 4193-4205.

Fernandez-Casado M., De Stephanis R., Perez Gimeno N., Gozalbes P. 2004. Evidences of site fidelity in the Strait of Gibraltar for sperm whales (Physeter macrocephalus). European Research on Cetaceans - 15. Proc. 15th Ann. Conf. ECS. Rome.

Frantzis A., Alexiadou P. 2008. Male sperm whale (Physeter macrocephalus) coda production and coda-type usage depend on the presence of conspecifics and the behavioural context. *Canadian Journal of Zoology* 86(1): 62-75.

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

Frantzis A., Swift R., Gillespie D., Menhennett C., Gordon J., Gialinakis S. 1999. Sperm whale presence off South-West Crete, Eastern Mediterranean Sea. European Research on Cetaceans - 13. Proc. 13th Ann. Conf. ECS: 214-217. Valencia, Spain.

Gannier A., Drouot V., Goold J.C. 2002. Distribution and relative abundance of sperm whales in the Mediterranean Sea. *Mar. Ecol. Prog. Ser.* 243: 281-293.

IFAW. 2006. Sperm whale abundance estimates from acoustic surveys of the Ionian Sea and Straits of Sicily in 2003. Albert Embankment, London, SE1 7UD. ACCOBAMS. "Song of the Whale" Team, International Fund for Animal Welfare, UK.

International Whaling Commission. 1994. Report of the workshop on mortality of cetaceans in passive fishing nets and traps. *Report of the International Whaling Commission (Special Issue)* 15: 6-71.

Italian Cetacean Stranding Database. On line database. Available at: http://mammiferimarini.unipv.it/.

IUCN. 2012. IUCN Red List of Threatened Species (ver. 2012.1). Available at: http://www.iucnredlist.org. (Accessed: 19 June 2012).

Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M. 2001. Collisions between ships and whales. *Marine Mammal Science* 17, 35–75.

Laran S., Drouot-Dulau V. 2007. Seasonal variation of striped dolphins, fin- and sperm whales' abundance in the Ligurian Sea (Mediterranean Sea). *Journal of the Marine Biological Association of the United Kingdom* 87(1): 345-352.

Lewis T., Gillespie D., Lacey C., Matthews J., Danbolt M., Leaper R., McLanaghan R., Moscrop A. 2007. Sperm whale abundance estimates from acoustic surveys of the Ionian Sea and Straits of Sicily in 2003. *Journal of the Marine Biological Association of the United Kingdom* 87: 353-357.

Moulins A. and Würtz M. 2005. Occurrence of a herd of female sperm whales and their calves (Physeter catodon), off Monaco, in the Ligurian Sea. *J. Mar. Biol. Ass. U.K.* 85(1): 213-214.

NAMSC. 2004. North Atlantic & Mediterranean Sperm Whale Catalogue. Available at:

www.ifaw.org/namsc.

Notarbartolo di Sciara, G. 1990. *A note on the cetacean incidental catch in the Italian driftnet swordfish fishery, 1986-1988. Rep. Int. Whal. Commn 40:459.*.

Notarbartolo di Sciara, G., Agardy, T., Hyrenbach, D., Scovazzi, T. & Van Klaveren, P. 2008. The Pelagos Sanctuary for Mediterranean marine mammals. *Aquatic Conservation: Marine and Freshwater Ecosystems* doi: 10.1002/aqc.855.

Notarbartolo di Sciara G., Bearzi G., Cañadas A., Frantzis A. 2004. High mortality of sperm whales in the north-western Mediterranean, 1971-2003. Scientific Committee of the International Whaling Commission, Sorrento, 29 June – 10 July 2004.

Notarbartolo di Sciara G., Gordon J. 1997. Bioacoustics: a tool for the conservation of cetaceans in the Mediterranean Sea. *Marine and Freshwater Behaviour and Physiology* 30: 125-146.

Parona C. 1897. Notizie storiche sopra i grandi cetacei dei mari italiani ed in particolare sulle quattro balenottere catturate in Liguria nell'autunno 1896. *Atti Soc. Ital. Sci. Nat. Mus. Civ. St. Nat. Milano* 36: 297-373.

Pesante, G., Collet, A., Dhermain, F., Frantzis, A., Panigada, S., Podestà, M. and Zanardelli, M. 2002. Review of Collisions in the Mediterranean Sea. Proceedings of the Workshop: "Collisions between Cetaceans and Vessels: can we Find Solutions?" 40 (Special issue): 5-12. Rome, Italy.

Pierantonio N., Pavan G., Airoldi S., Panigada S. 2008. Presence of socializing sperm whales in the Ligurian Sea assessed through acoustic, behavioral and photoidentification data. 22Nd Annual Conference of the European Cetacean Society. Egmond aan Zee, The Netherlands.

Podestà, M. and Magnaghi, L. 1989. Number of cetacean bycatches in the Ligurian Sea. *European Research on Cetaceans* 3: 67-70.

Praca E., Gannier A. 2008. Ecological niches of three teuthophageous odontocetes in the northwestern Mediterranean Sea. *Ocean Science* 4(1): 49-59.

Reeves, R. and Notarbartolo di Sciara, G. (compilers and editors). 2006. *The status and distribution of cetaceans in the Black Sea and Mediterranean Sea. IUCN Centre for Mediterranean Cooperation, Malaga, Spain. 137 pp.*.

Rendell L., Cañadas A. 2005. Report on Balearics Sperm Whale Project, 2003-2004. Alnitak and SMRU.

Tejedor A., Sagarminaga,R., de Stephanis R. ,Cañadas A., Lago A. 2008. Management of MPAs: options and challenges for the maritime transport sector. Spanish case studies. *Proceedings of the ECS/ASCOBANS/ACCOBAMS workshop on selection criteria for marine protected areas for cetaceans. ECS* Special Publication Series N. 48.

Tudela, S.; Guglielmi, P.; El Andalossi, M.; Kai Kai A. and Maynou, F. 2003. Biodiversity impact of the Moroccan driftnet fleet operating in the Alborán Sea (SW Mediterranean). WWF Mediterranean Programme, Rome.

Whitehead, H. 2003. *Sperm Whales: Social Evolution in the Ocean*. University of Chicago Press, Chicago, IL, USA.

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
9. Marine Neritic -> 9.1. Marine Neritic - Pelagic	-	Suitable	Yes
10. Marine Oceanic -> 10.1. Marine Oceanic - Epipelagic (0-200m)	-	Suitable	Yes
10. Marine Oceanic -> 10.2. Marine Oceanic - Mesopelagic (200-1000m)	-	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
4. Transportation & service corridors -> 4.3. Shipping lanes	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale)	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale)	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
6. Human intrusions & disturbance -> 6.2. War, civil unrest & military exercises	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
5. Law & policy -> 5.1. Legislation -> 5.1.1. International level
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.2. Policies and regulations

The IUCN Red List Partnership

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