



THE CONSERVATION STATUS OF CETACEANS IN THE MEDITERRANEAN SEA

Trends and changes after a decade
of conservation efforts



MEDITERRANEAN
SEA

The IUCN Red List of Threatened Species™



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Common bottlenose dolphin (*Tursiops truncatus*) © Joan Gonzalvo, Tethys Research Institute

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IUCN is pleased to acknowledge the support of its Framework Partners who provide core funding: Ministry of Foreign Affairs, Denmark; Ministry for Foreign Affairs, Finland; Government of France and the French Development Agency (AFD); Ministry of Environment, Republic of Korea; Ministry of the Environment, Climate and Sustainable Development, Grand Duchy of Luxembourg; the Norwegian Agency for Development Cooperation (Norad); the Swedish International Development Cooperation Agency (Sida); the Swiss Agency for Development and Cooperation (SDC) and the United States Department of State.

This publication was produced by the IUCN Centre for Mediterranean Cooperation in collaboration with the IUCN Centre for Science and Data and the IUCN Species Survival Commission (SSC). Financial support for this publication was provided the MAVA Foundation and Red Eléctrica de España.

Published by:	IUCN, Gland, Switzerland	
Produced by:	IUCN Centre for Mediterranean Cooperation, Malaga, Spain	
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Recommended citation:	IUCN (2023). <i>The conservation status of cetaceans in the Mediterranean Sea: trends and changes after a decade of conservation efforts</i> . Gland, Switzerland: IUCN.	
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Executive summary



This report gives an overview of the status of Mediterranean cetaceans (whales and dolphins), informed by IUCN Red List assessments undertaken between 2018 and 2022. Compared to the first review by IUCN, published in 2012, these recent assessments provide better information on the status of resident Mediterranean subpopulations, thanks to improved regional monitoring. A total of 24 cetacean species have been recorded in the Mediterranean Sea, of which 10 are considered to be resident. There has been a recognition of several resident species subpopulations that are considered to be endemic to the Mediterranean Sea, located in the Gulf of Ambracia, Gulf of Corinth and the Strait of Gibraltar.

Four of the 10 resident species have two subpopulations in the basin, altogether amounting to 13 cetacean subpopulations residing in the Mediterranean. Ten of the 13 subpopulations are assessed as threatened, combining to a total of 77% of the resident cetacean subpopulations. Unlike in the review from 2012, all of the assessments had sufficient data available. However, because of the Data Deficient species in the first assessments, and the recognition of five new Mediterranean subpopulations in the recent assessments, it is impossible to discern an overall trend in the level of threat. For the 5 subpopulations that underwent a change in status in the last 10 years, they are not considered a genuine change in Red List status. However, most of the recent assessments of subpopulations show a decreasing population trend, with just one positive, and four unknowns. Cetacean species are concentrated in the Western part of the Mediterranean, with high species richness zones of both threatened and non-threatened species concentrated in the Alboran Sea, the Strait of Gibraltar, the Balearic Sea, the Sicilian Sea, the Ionian Sea and close to the Gulfs of Corinth and Ambracia.

According to the recent assessments, the primary threats to Mediterranean cetaceans are fishery-related mortality (including bycatch, injury/mortality, prey depletion), noise and industrial pollution. Cetaceans are caught by illegal driftnets, fishing gear, and long-line fisheries, or get injured by set nets by sport fishers. Since the review of 2012, noise pollution has been identified as a highly significant threat, impacting ten of the 12 assessed subpopulations. Underwater noise is a high stressor for cetaceans, affecting them by masking sounds relevant to communication and foraging, reduced their ability to avoid ship

collisions and stranding, etc. High concentrations of industrial pollutants, such as organic contaminants (DDTs, PCBs) and heavy metals (mercury and cadmium) have been found in the Mediterranean Sea. This is an even greater threat in the semi-enclosed Gulfs of Corinth and Ambracia, where pollutant inflows may be high and water exchange low. Other threats include rising water temperatures resulting from climate change, collisions with vessels, and direct disturbance by boaters.

In order to protect cetacean species in the Mediterranean, extensive conservation strategies have been proposed. A wide range of international treaties, legislation, conventions and agreements exist to protect cetaceans and their habitats, including the Convention on Biological Diversity (CBD), the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS). Marine Protected Areas play a key role in protecting important feeding and migration corridors for cetaceans. Two large Specially Protected Areas of Mediterranean Importance (SPAMI), as well as 19 Important Marine Mammal Areas (IMMA) have been designated in the Mediterranean Sea. ACCOBAMS is also working on the identification of new relevant Cetaceans Critical Habitats (CCH).

According to the recent assessments of the Mediterranean cetacean subpopulations, the most required conservation actions include the effective enforcement of legislation on fishing techniques, marine resource exploitation and protected sites/species. Other actions should focus on limiting the spread and intensity of harmful noise, reduce the inputs of pollutants and the development and implementation of robust management plans for the conservation of cetaceans. More extensive research is also needed to better understand the scope and scale of known threats and assess the population trends in the entire Mediterranean Sea, thereby continuing the monitoring efforts for all cetacean species.

This second regional IUCN Red List assessment on the cetacean species in the Mediterranean Sea shows a clearer image of the cetacean subpopulations residing in the Mediterranean, but also highlights the need for more efforts to halt the decline of cetacean subpopulations resident in the Mediterranean Sea.

Acknowledgements

Assessing species for the IUCN Red List of Threatened Species™ relies on the willingness of dedicated experts to contribute and pool their collective knowledge to make the most reliable estimates of the conservation status of species. This work would not have been possible without their commitment to species conservation.

We would like to thank the following people who gave their time and valuable expertise to assess the conservation status of cetacean species, with apologies to anyone whose name has inadvertently been omitted or misspelled: Antonella Arcangeli, Giovanni Bearzi, Silvia Bonizzoni, Ana Cañadas, Eva Carpinelli, Léa David, Ruth Esteban, Caterina Maria Fortuna, Alexandros Frantzis, Pauline Gauffier, Tilen Genov, Oz Goffman, Joan Gonzalvo, Drasko Holcer, Dani Kerem, Hélène Labach, Caterina Lanfredi, Giancarlo Lauriano, Letizia Marsili, Sandro Mazzariol, André Moura, Ada Natoli, Giuseppe Notarbartolo di Sciara, Ayaka Amaha Öztürk, Daniela Silvia Pace, Simone Panigada, Androniki Pardalou, Graham Pierce, Enrico Pirotta, Luke Rendell, Massimiliano Rosso, Nina Luisa Santostasi, Aviad Scheinin, Arda M. Tonay, Philippe Verborgh.

We would also like to thank the following experts who additionally contributed to the regional assessments of the Mediterranean cetacean species included in this booklet: Sabina Airoldi, Aylin Akkaya Baş, Hedia Attia El Hili, Marta Azzolin, Assumpció Borrell Thió, Gill Braulik, José María Brotons, Carla Álvarez Chicote, Renaud de Stephanis, Nicola Hodgins, Tim Lewis, Hicham Masski, Clara Monaco, Michela Podestà, Elisabetta Remonato, Anna Schleimer, Biagio Violi.

We gratefully acknowledge the expertise of Barbara Taylor (IUCN SSC Cetacean Red List Authority) and Randall Reeves (Chair of the Cetacean Specialist Group), who reviewed and provided invaluable feedback on all draft Red List assessments. Finally, we would like to thank the people from IUCN-Med that participated in the production and the reviewing of this book: Lucia de la Fuente Casilda, Pablo Rossi Orts, María del Mar Otero and Marina Huertas.

ACRONYMS

ACCOBAMS	Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area
AHD	Acoustic Harassment Devices
Barcelona Convention	Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean
BCCEW	Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention)
CCHs	Cetacean Critical Habitats
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals (also known as the Bonn Convention)
DDD	Dolphin Deterrent Devices
DDT	Dichlorodiphenyltrichloroethane: a persistent insecticide used in the past in agriculture and for insect control
EU	European Union
EU Habitats Directive	European Union (EU) Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna
GFCM	General Fisheries Commission for the Mediterranean
ICRW	International Convention for the Regulation of Whaling, the Convention responsible for establishing the IWC
IGO	Intergovernmental Organisations
IMMAs	Important Marine Mammal Areas
IUCN	International Union for Conservation of Nature
IUCN-Med	IUCN Centre for Mediterranean Cooperation
IWC	International Whaling Commission
MAP	Mediterranean Action Plan of the Barcelona Convention
MPA	Marine protected area
MSFD	Marine Strategy Framework Directive of the European Union
PCB	Polychlorinated biphenyls: formerly used in industrial and consumer products
POPs	Persistent Organic Pollutants
SPAMI	Specially Protected Area of Mediterranean Importance
SPA/BD Protocol	Protocol Concerning Specially Protected Areas and Biological Diversity of the Barcelona Convention (Mediterranean region)
SSC	Species Survival Commission of IUCN

1. Introduction: Current situation of cetaceans in the Mediterranean Sea

Ten years from the first review (IUCN, 2012b) of the status of Mediterranean cetaceans (whales and dolphins) informed by IUCN Red List assessments undertaken between 2003 and 2009, this new analysis reveals that their Red List status have undergone changes. Thanks to improved regional monitoring of cetacean populations, the recent assessments provide better information on cetacean’s distribution, population size and trend, and on the status of the resident Mediterranean subpopulations.

The previous review undertaken in 2012 (IUCN, 2012b), noted that 20 cetacean species (and three subspecies) had been recorded in the Mediterranean Sea, with eight of these having resident populations and twelve considered occasional visitors or vagrants.

By 2022, 24 cetacean species (27 including subspecies) have been recorded in the Mediterranean Sea (ACCOBAMS, 2021a) of which 10 species are considered resident (Table 1) and 17 are considered to be vagrant or occasional visitors (Table 2). The resident species have been reassessed for the IUCN Red List. One outcome of the additional research that has taken place since 2012 is the recognition of further species subpopulations that are considered to be endemic to the Mediterranean Sea. The Common dolphin (*Delphinus delphis*) Mediterranean subpopulation is now split into the Gulf of Corinth subpopulation and the Inner Mediterranean subpopulation. Similarly, the Striped dolphin (*Stenella coeruleoalba*) Mediterranean subpopulation is now separated into the Gulf of Corinth subpopulation and the Mediterranean subpopulation. The former single Long finned Pilot whale (*Globicephala melas*) Mediterranean subpopulation is now recognised to occur as two separate subpopulations: the Inner Mediterranean subpopulation and the Strait of Gibraltar subpopulation. Also, for the former single Common Bottlenose dolphin (*Tursiops truncatus*) Mediterranean subpopulation, two separate subpopulations are now recognised: the Mediterranean subpopulation and the Gulf of Ambracia subpopulation. The Red List assessments of the 10 Mediterranean species were published over the period 2019-2022. The Killer whale (*Orcinus orca*), although not part of the Mediterranean Sea assessment as it is not restricted or endemic to the Mediterranean Sea, was also assessed as a Strait of Gibraltar subpopulation (Figure 2). However, it has been excluded from analyses as its distribution extends significantly out of the Mediterranean Sea into the Eastern Atlantic.

With no subpopulations considered to be Data Deficient and none Extinct, 77% of the resident Mediterranean subpopulations of cetaceans are considered to be threatened with extinction (Figure 1). Ten of the 13 endemic subpopulations of cetaceans that are resident in the Mediterranean Sea are assessed as threatened i.e., Critically Endangered (CR, three subpopulations), Endangered (EN, six subpopulations) or Vulnerable (VU, one subpopulation). Two species previously classified as Data Deficient (DD) are now assessed as threatened: Risso’s dolphin (*Grampus griseus*) and Long finned Pilot whale (*Globicephala melas*) Mediterranean subpopulations (Table 1). Eight of the subpopulations have a declining population trend, one (the *Stenella coeruleoalba* Mediterranean subpopulation) has an increasing population trend, whilst the population trend of four species is not known.

“Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less).” (IUCN, 2012a)

In 2012, 100% of the extant Mediterranean subpopulations for which sufficient data were available were assessed as threatened (IUCN, 2012b). However, three subpopulations were considered Data Deficient, and therefore the proportion of threatened species could have been as low as 62.5% if all the DD species were found to be Least Concern (IUCN, 2022). Because of the number of DD species in the first assessments, and the recognition of five new Mediterranean subpopulations in the most recent assessments, it is not possible to discern any overall trend in the level of threat of Mediterranean cetaceans. For example, the Cuvier’s beaked whale (*Ziphius cavirostris*) Mediterranean subpopulation was previously classified as Data Deficient and has now been assessed as Vulnerable. Even more, the Rough-toothed dolphin (*Steno bredanensis*) Mediterranean subpopulation was previously Not Evaluated, but has now been assessed as Near Threatened. This species was considered a vagrant/visitor in the previous assessment, but new information allowed to confirm the presence of a Mediterranean subpopulation.

There are five subpopulations whose status have undergone change over this period, however, none of these changes are considered to have occurred as a result of a genuine change in Red List status (Table 3). The Fin whale Mediterranean subpopulation assessment moved from Vulnerable in 2011 (Panigada and Notarbartolo di Sciara, 2012) to Endangered in 2021 (Panigada et al., 2021), but this is considered a non-genuine change because the earlier assessment used the total number of individuals rather than the number of “mature individuals” (Taylor et al., 2007). The other four subpopulations have undergone non-genuine change as a result of new information gathered by the ACCOBAMS Survey Initiative (ACCOBAMS, 2021b), which provided much better estimates of population sizes and distribution than previously available.

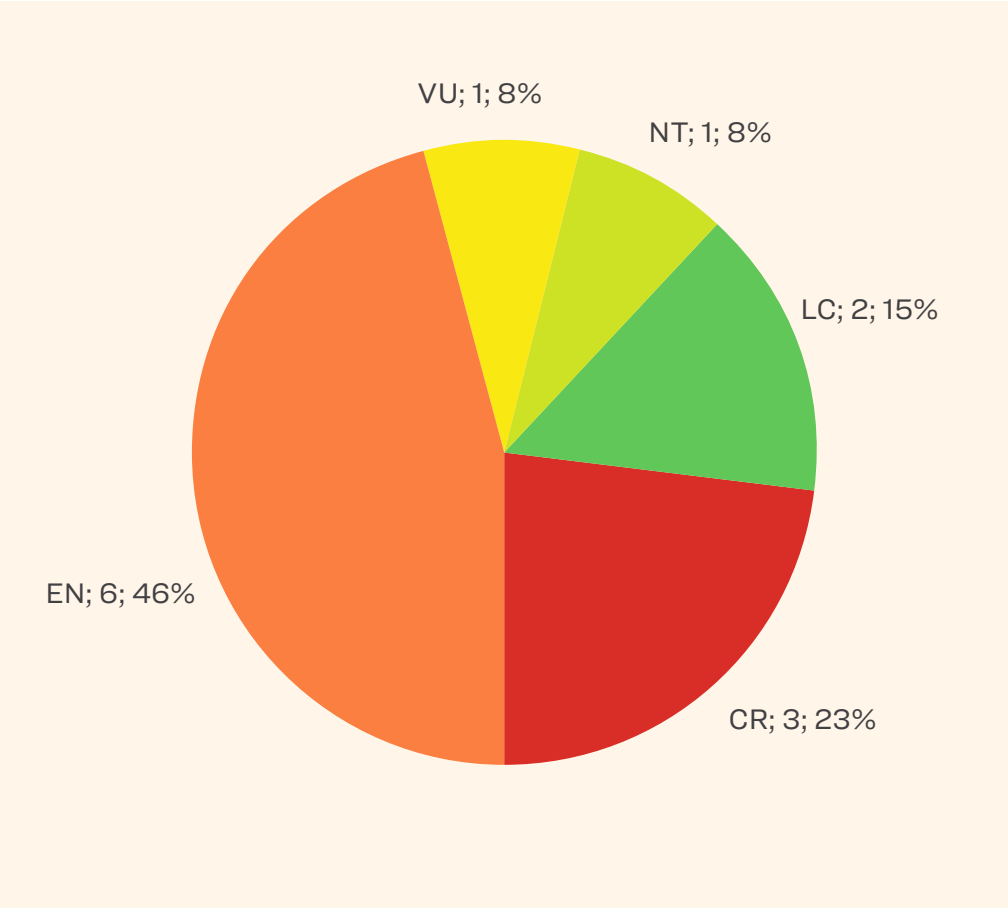


FIGURE 1. Summary of the current Red List status of resident endemic Cetacean subpopulations in the Mediterranean Sea. Source: IUCN Red List.

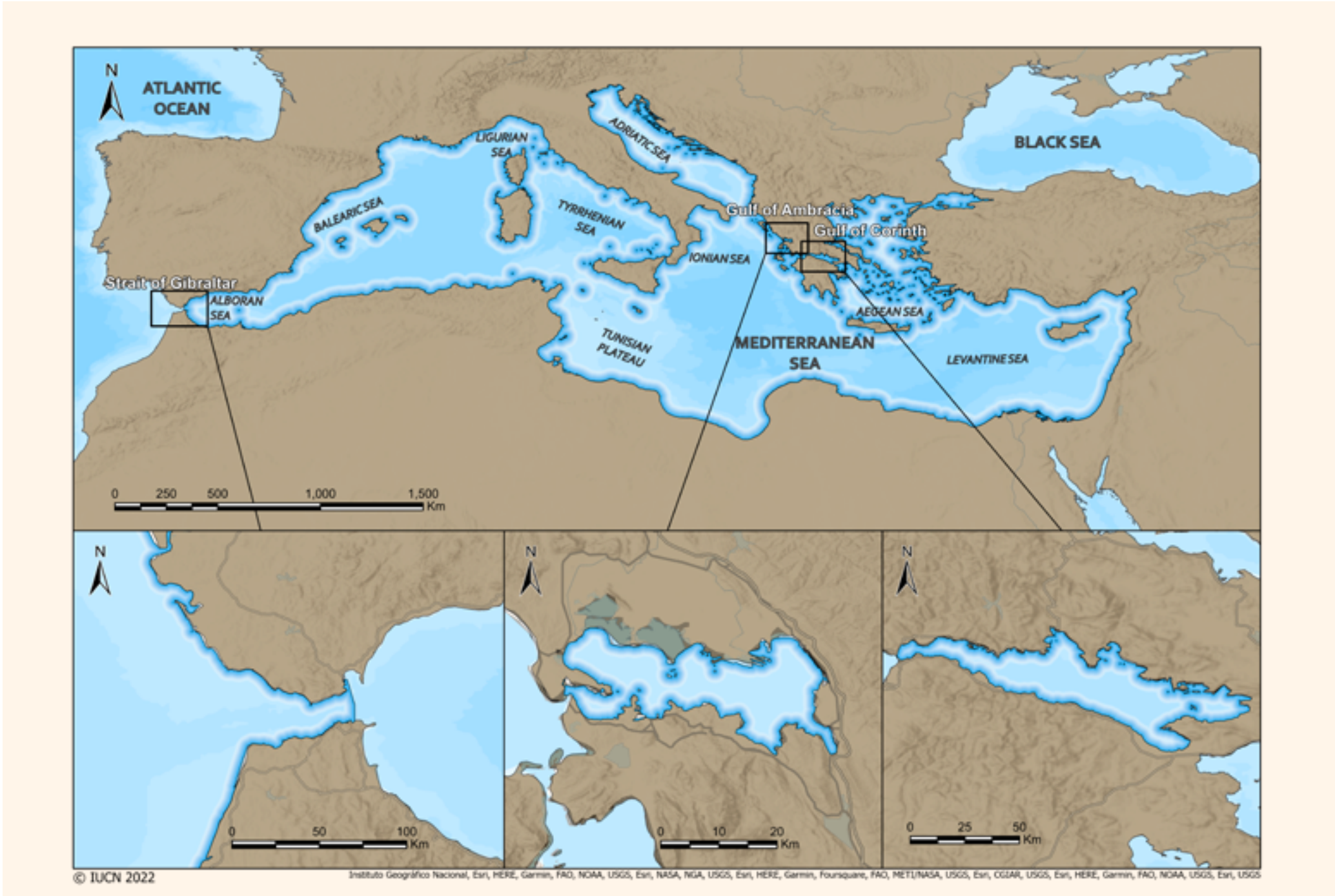


FIGURE 2. Map showing the delimited areas for the Red List assessment of Mediterranean cetacean species (Strait of Gibraltar, Gulf of Ambracia, Gulf of Corinth and Mediterranean Sea). Includes also the main seas, straits and gulfs mentioned in the text for the distribution of cetaceans.

Table 1.
Summary of the regional and global changes in IUCN Red List status of all cetaceans with resident populations in the Mediterranean Sea

Family	Species	Scientific name	IUCN Red List status following the 2006-2008 assessments				IUCN Red List status following the 2018-2021 assessments			
Balaenopteridae	Fin whale	<i>Balaenoptera physalus</i>	Mediterranean subpopulation	VU C2a(ii)	2012	VU	Mediterranean subpopulation	EN C2a(ii)	2021	EN
Delphinidae	Common dolphin	<i>Delphinus delphis</i>	Mediterranean subpopulation	EN A2abc	2003	EN	Inner Mediterranean subpopulation	EN A2cde; C1	2022	EN
							Gulf of Corinth subpopulation	CR D	2020	CR
	Long-finned pilot whale	<i>Globicephala melas</i>	Mediterranean subpopulation	DD	2012	DD	Inner Mediterranean subpopulation	EN C2a(ii)	2021	EN
							Strait of Gibraltar subpopulation	CR C2a(ii)	2021	CR
	Risso's dolphin	<i>Grampus griseus</i>	Mediterranean subpopulation	DD	2012	DD	Mediterranean subpopulation	EN A2bc	2022	EN
	Killer whale	<i>Orcinus orca</i>	Mediterranean	NE	/	NE	Strait of Gibraltar subpopulation	CR C2a(i,ii); D	2019	CR
	Striped dolphin	<i>Stenella coeruleoalba</i>	Mediterranean subpopulation	VU A2bcde	2012	VU	Mediterranean subpopulation	LC	2022	LC
							Gulf of Corinth subpopulation	EN B1ab(iii)	2022	EN
	Rough-toothed dolphin	<i>Steno bredanensis</i>	Mediterranean subpopulation	NE	/	NE	Mediterranean subpopulation	NT D1	2021	NT
	Common Bottlenose dolphin	<i>Tursiops truncatus</i>	Mediterranean subpopulation	VU A2cde	2012	VU	Mediterranean subpopulation	LC	2021	LC
							Gulf of Ambracia subpopulation	CR C2a(ii)	2021	CR
Physeteridae	Sperm whale	<i>Physeter macrocephalus</i>	Mediterranean subpopulation	EN C2a(ii)	2012	EN	Mediterranean subpopulation	EN C2a(ii)	2021	EN
Ziphiidae	Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Mediterranean subpopulation	DD	2012	DD	Mediterranean subpopulation	VU C2a(ii)	2018	VU

Red List categories (CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated).
Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023.

Table 2.
Summary of the status of vagrant and visiting cetaceans recorded from the Mediterranean Sea (Source: ACCOBAMS, 2021a).

Scientific name	Common name	Status 2018-2021	Global RL status
<i>Balaenoptera acutorostrata</i>	Common minke whale	Visitor. The minke whale is considered a “visitor species” in the Mediterranean (average <1 record per year) with one vagrant recorded in the Black Sea (Reeves and Notabartolo di Sciara, 2006).	LC
<i>Balaenoptera borealis</i>	Sei whale	Vagrant. There are very few records from the Mediterranean (Notarbartolo di Sciara and Birkun, 2010).	EN A1abd
<i>Balaenoptera edeni</i>	Bryde's whale	Vagrant. The revised taxonomic concept of <i>Balaenoptera edeni</i> that excludes the former Mexico Gulf subpopulation (now recognised as a separate species: <i>B. ricei</i>) has not yet been assessed for the IUCN Red List. The former concept was LC globally. Presence in the ACCOBAMS area considered ‘doubtful’ by ACCOBAMS (2021a), but included here on the basis of at least three confirmed strandings in the Mediterranean Sea (Bay of Algeciras, Torremolinos and Alexandria [Abo-Taleb et al., 2020]) There have also been several confirmed sightings in Algarve in 2020-2022 (P. Gauffier pers. comm., 2022).	NE
<i>Eschrichtius robustus</i>	Grey whale	Vagrant. One individual was seen in May 2010 in the Mediterranean Sea off Israel, and a few days later again off Spain (Scheinin et al., 2011).	LC
<i>Eubalaena glacialis</i>	North atlantic right whale	Vagrant. It may also have occurred in the Mediterranean Sea (Rodrigues et al., 2018).	CR C2(ii)
<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	Vagrant. A small group was observed once in 2010 in the Adriatic Sea, Italy (Verborgh et al., 2016).	LC
<i>Hyperoodon ampullatus</i>	Northern bottlenose whale	Vagrant. There are a few reports from the Mediterranean Sea (Cañadas and Sagarminaga, 2000), but these whales are not seen regularly in enclosed seas (Moors-Murphy, 2018).	NT C1
<i>Kogia sima</i>	Dwarf sperm whale	Vagrant. There is only one record of a Dwarf Sperm whale in the Mediterranean Sea, which is considered extralimital.	LC
<i>Megaptera novaeangliae</i>	Humpback whale	Visitor. Humpback Whales were previously very rare in the Mediterranean Sea; there has been a notable increase in sightings since 1990, but they are still not common (Russo et al., 2016).	LC
<i>Mesoplodon bidens</i>	Sowerby's beaked whale	Vagrant.	LC
<i>Mesoplodon densirostris</i>	Blainville's beaked whale	Vagrant. There are only rare records of this species occurring in the Mediterranean, and therefore the species is considered to be a vagrant there.	LC
<i>Mesoplodon europaeus</i>	Gervais' beaked whale	Vagrant. There is only one stranding recorded from the Mediterranean Sea (Podesta et al., 2005)	LC
<i>Phocoena phocoena</i>	Atlantic harbour porpoise	Vagrant.	LC
<i>Pseudorca crassidens</i>	False killer whale	Visitor, most probably regular/resident. Observed only occasionally in the Mediterranean Sea (Holcer et al., 2021; Notarbartolo di Sciara et al., 2017; Baldwin et al., 1999; Leatherwood et al., 1989).	NT A2d
<i>Orcinus orca</i>	Orca, killer whale	Vagrant (at least one confirmed vagrancy of a pod from Iceland (Notarbartolo di Sciara & Tonay, 2021). The <i>Orcinus orca</i> Strait of Gibraltar subpopulation was assessed as CR (C2a(i,ii); D) in 2019 (Esteban and Foote, 2019). Esteban and Foote (2019) reported that the species mainly occurs in the Strait of Gibraltar, with only a few sporadic sightings in the surrounding waters of the Strait, namely Gulf of Cadiz and the Alborán Sea and along the west and north coasts of the Iberian Peninsula.	DD
<i>Sousa plumbea</i>	Indian ocean humpback dolphin	Vagrant.	EN A2cd + 3cd + 4cd
<i>Steno bredanensis</i>	Rough-toothed dolphin	Now considered to be resident. See page 18	LC

Red List categories (CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated).
Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023.

Table 3. Non-genuine changes in Cetaceans Red List status between 2012 and 2022.

Subpopulation	2012	2022	Comment
Fin whale <i>(Balaenoptera physalus)</i> Mediterranean subpopulation	VU	EN	Non-genuine change*: This is considered a non-genuine change as a result of a different approach in the earlier assessment. In Panigada and Notarbartolo di Sciara (2012), the total estimated population size across the Mediterranean basin (based on a 1991 survey in the western Mediterranean; Forcada et al., 1996) was used to assume that a realistic estimate for the total basin would not exceed 5,000 individuals, thus assessing the species as VU under criteria under C2a(ii) (<10,000 mature individuals in a single subpopulation), without taking account of the proportion of the overall population that are likely to be mature (48% of the total population being mature: Taylor et al., 2007), thus overestimating the number of mature individuals. In this reassessment, the threshold for Endangered (<2,500 mature individuals) is met, applying the adjustment proposed by Taylor et al. (2007).
Risso’s dolphin <i>(Grampus griseus)</i> Mediterranean subpopulation	DD	EN	Non-genuine change: The Mediterranean Subpopulation was first assessed, as Data Deficient, in 2010 (Gaspari and Natoli, 2012). Since then, there has been extensive survey for the species in some parts of the Mediterranean basin, which gathered new information on the distribution, population size, and population trend of this subpopulation.
Striped dolphin <i>(Stenella coeruleoalba)</i> Mediterranean subpopulation	VU	LC	Non-genuine change: Recent information, primarily obtained through the ACCOBAMS Survey Initiative (ACCOBAMS, 2021b) has shown the <i>Stenella coeruleoalba</i> Mediterranean subpopulation to be much larger (in terms of mature individuals) than previously suspected.
Common bottlenose dolphin <i>(Tursiops truncatus)</i> Mediterranean subpopulation	VU	LC	Non-genuine change: New available information (ACCOBAMS, 2021b) enabled a more comprehensive current population estimate and threats valuation. One of the main causes of decline identified in the previous assessment (systematic culling) ceased at the beginning of the 3-generation length period in most of the Mediterranean basin. Although it was not possible to estimate a population trend for the whole 3-generations period due to the lack of comparable data from the earlier time (or beginning) of the period, the new information available does not support a population decline in its later time (or in the last two generations).
Cuvier’s beaked whale <i>(Ziphius cavirostris)</i> Mediterranean subpopulation	DD	VU	Non-genuine change: As a result of recently collected information on abundance and threats, this subpopulation is no longer Data Deficient.

* The current published assessment of the Fin whale Mediterranean subpopulation considers this to be a genuine change, however an errata assessment is in preparation to revise this to a non-genuine change.

Red List categories (CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated).

Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023

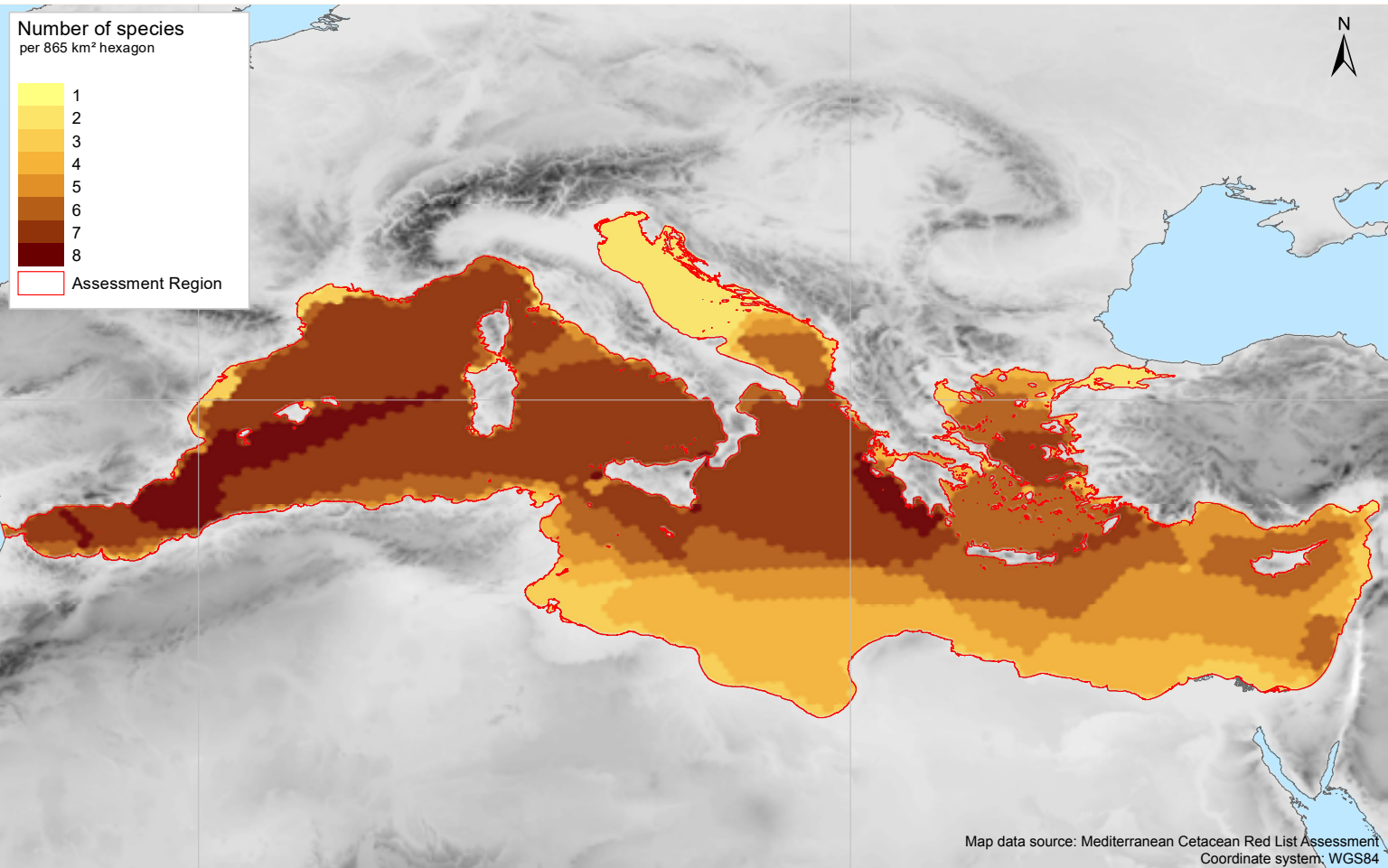


FIGURE 3. Overall species richness of Mediterranean endemic cetacean subpopulations. Maps based on the data collected by the IUCN Red List assessors.

2. Species richness

The map of the overall species richness shows a non-homogenous geographical distribution, with most species being concentrated in the Western part of the Mediterranean (Figure 3). High species richness zones for cetaceans are located in the Alboran Sea close to the Strait of Gibraltar, in the Balearic Sea off the coast from Spain, along the coast of Sicily and in the Ionian Sea off the coast from Peloponnese in Greece and close to the Gulfs of Corinth and Ambracia.

The spatial distribution of threatened cetacean species has a similar pattern than the overall species richness (Figure 4), with most threatened species concentrated in the Western part of the Mediterranean, in particular close to the Iberian Peninsula. The highest concentration are found in the Alboran and Balearic Seas. Finally, there is also a high concentration of threatened cetacean species found in the Ionian Sea, close to the Gulfs of Ambracia and Corinth.

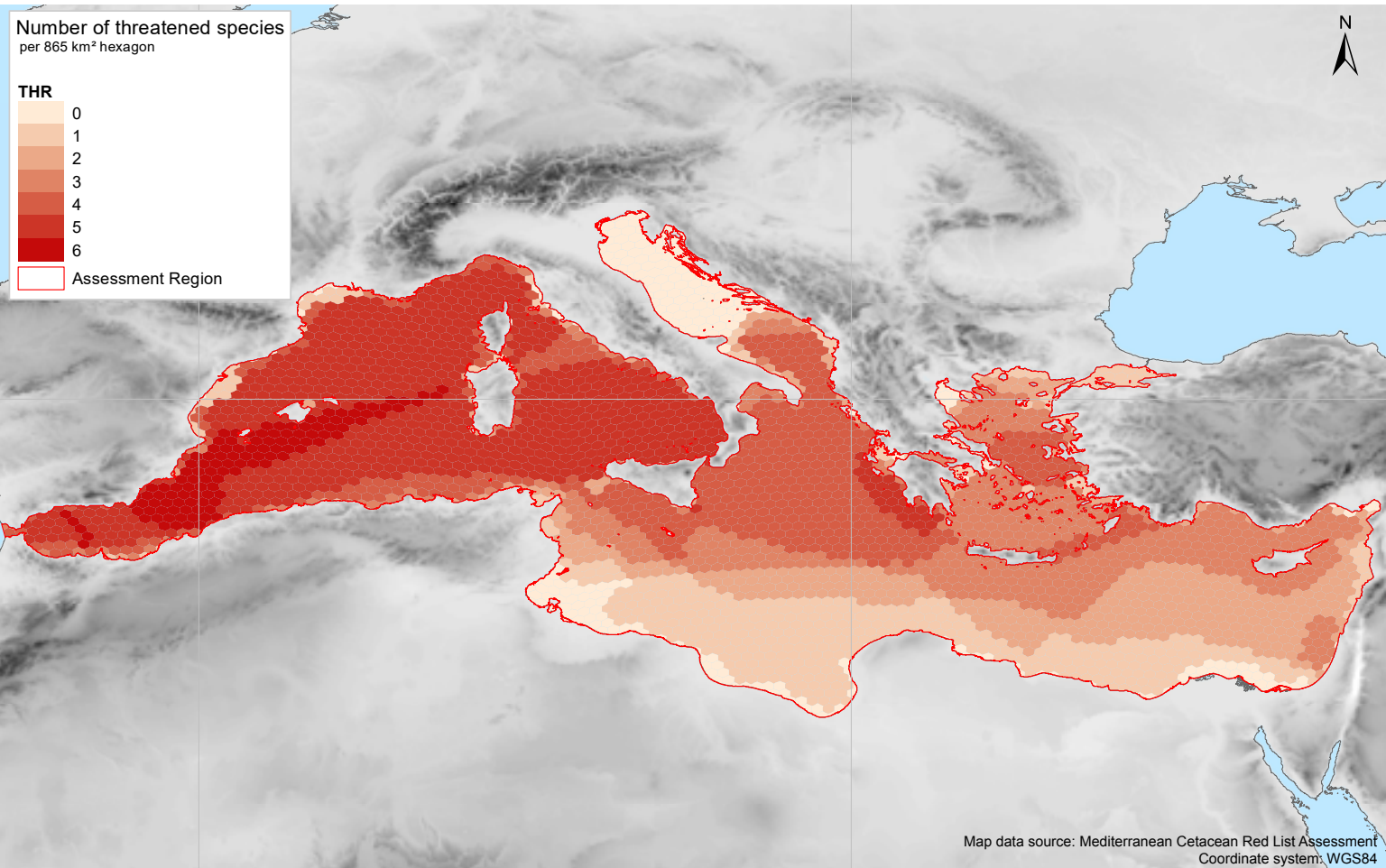


FIGURE 4. Threatened species richness of Mediterranean endemic cetacean subpopulations. Maps based on the data collected by the IUCN Red List assessors.

3. Main threats

Based on the analysis of recent assessments (Figure 5), the principal threat to Mediterranean cetacean subpopulations is fishery-related mortality, encompassing unintentional impacts of bycatch, direct injury and mortality, and prey depletion (which may be caused by fisheries either directly or indirectly). Although driftnets have officially been banned from the Mediterranean Sea since 2002, illegal driftnets result in unreported but likely significant cetacean mortality (Verborgh & Gauffier, 2021). Cetaceans can be occasionally caught by long-line fisheries, set nets, and injured by sports fishers (Kerem et al., 2021, Verborgh & Gauffier, 2021), and can be caught in gill-nets (Kerem et al., 2021). Bycatch is a significant threat, with cetaceans at risk of entanglement in many types of fishing gear (ACCOBAMS, 2019). Since 2008, little has been done in terms of implementing a systematic cetacean bycatch monitoring system in the Mediterranean (Natoli et al., 2021), and this is an urgent conservation need. The unregulated but legal use of Acoustic Harassment Devices or Dolphin Deterrent Devices (AHD or DDD) in the Mediterranean Sea, which is allowed under EU fishery regulations and recommended by regional IGOs (e.g. GFCM recommendation GFCM/36/2012/2, EU Regulation 2019/1241), is a source of concern too (Natoli et al., 2021), and links to the next most significant identified threat, noise pollution.

Noise pollution was identified as the next most significant threat, impacting ten (including nine threatened subpopulations) of the 12 assessed subpopulations. Noise pollution sources include AHD and DDDs, vessel disturbance, oil and gas prospecting and naval exercises deploying active low-frequency SONAR, and so on. Underwater noise from various maritime activities is recognised as a chronic, habitat-level stressor (Williams et al., 2020), and can affect cetaceans through a range of mechanisms, including temporary threshold shifts, spatial displacement and habitat exclusion, masking of sounds relevant to communication and foraging, disturbance and elevated stress levels, reducing their ability to avoid ship collisions, and modifications of short-term and possibly long-term behaviour (Panigada et al., 2021). Fin Whales, for example, were found to have modified their song characteristics to compensate for increased background noise conditions due to heavy maritime traffic, especially in the Strait of Gibraltar, with a possible increased energy cost and reduced communication efficiency (Castellote et al., 2012).

Industrial pollution is the next most significant threat, impacting nine subpopulations (7 of them threatened) in the Mediterranean Sea. Concentrations of organic contaminants such as DDTs and PCBs were 5–10 times higher in the north-western Mediterranean Basin (Praca et al., 2011, Lauriano et al., 2014, Pinzone et al., 2015) than in the North Atlantic (Méndez-Fernandez et al. 2014), and the levels found in the Mediterranean Sea are well above the thresholds considered harmful to the immune and reproductive systems in aquatic mammals (Lauriano et al., 2014; Pinzone et al., 2015), potentially resulting in decreased resilience to diseases. High concentrations of the heavy metals mercury and cadmium have been found in Long-finned pilot whales in the north-western Mediterranean (Pinzone et al., 2019), and halogenated natural products (MHC-1, TriBHD, TetraBHD, MeO-PBDEs, Q1, and related PMBPs) and halogenated flame retardants (PBDEs, HBB, Dec 602, Dec 603, and DP) have been found in the blubber and the brain of Long-finned pilot whales in the Alboran Sea (Barón et al., 2015). Pollution from a range of sources is of even greater significance in the semi-enclosed Gulf of Corinth (the *Delphinus delphis* Gulf of Corinth and *Stenella coeruleoalba* Gulf of Corinth subpopulations) and the Gulf of Ambracia (*Tursiops truncatus* Gulf of Ambracia subpopulation), where pollutant inflows may be high and water exchange low. DDT levels in the Gulf of Ambracia were four times higher than in neighbouring waters, indicating the existence of a real toxicological problem for Gulf of Ambracia subpopulation of the Common Bottlenose dolphin (Gonzalvo et al., 2016). In the Gulf of Corinth, the preferred habitat of the Striped dolphin Gulf of Corinth subpopulation overlaps with areas of massive disposal of residue from extraction of aluminium (“red mud”, including iron oxides, aluminium and titanium; Bearzi et al., 2016; Bonizzoni et al., 2019). See the individual species factsheets (below) for more details of the specific threats that impact them.

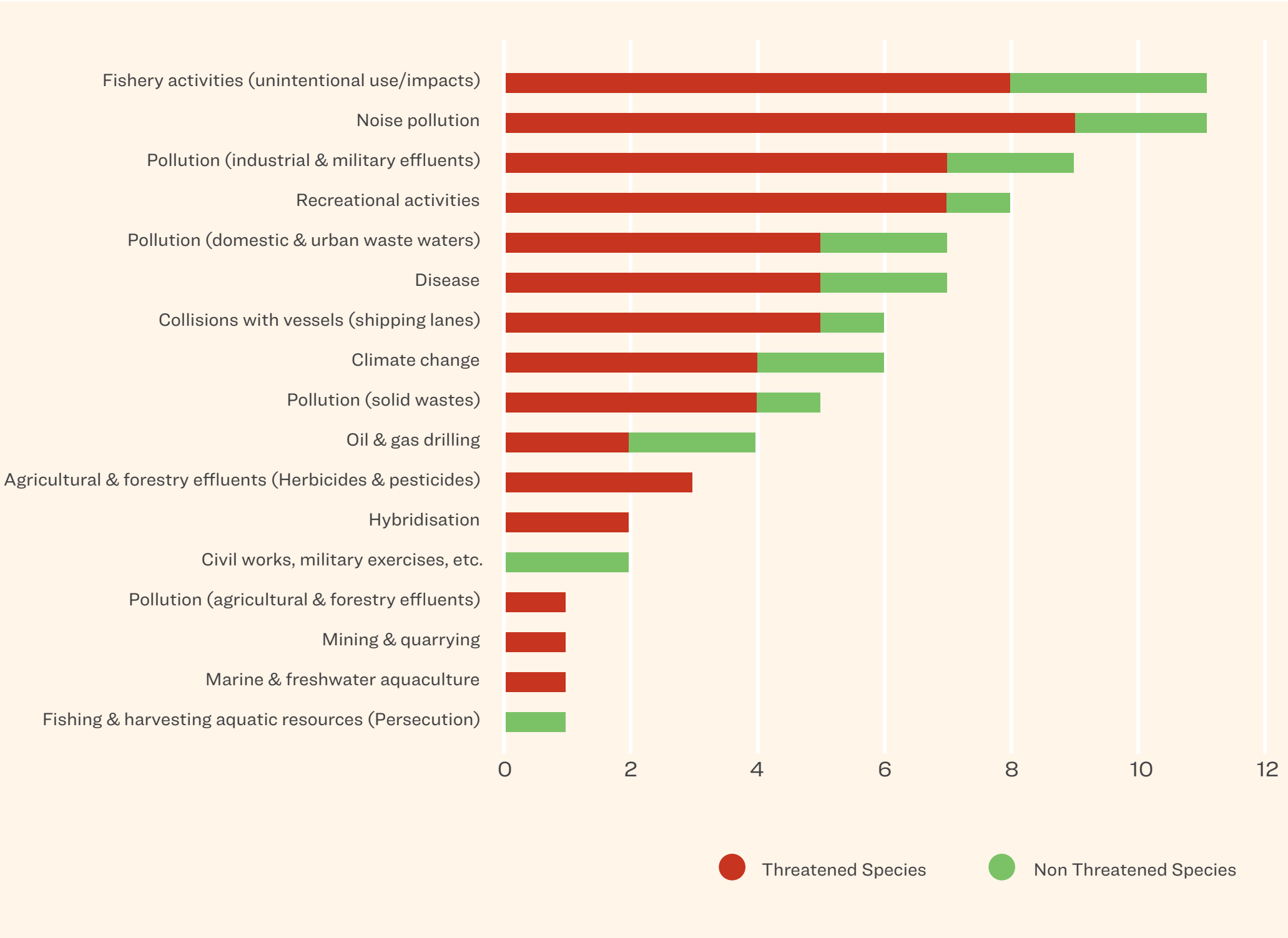


FIGURE 5. The Main threats affecting Mediterranean endemic cetacean subpopulations. Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023.



The Mediterranean Fin whale subpopulation is classified as Endangered in the IUCN Red List. © Cynthia Barile, Thetys Research Institute



Common bottlenose dolphin (*Tursiops truncatus*) © Joan Gonzalvo, Thetys Research Institute

4. Conservation measures and international treaties, conventions and agreements

Since the last assessment of the Mediterranean cetaceans in 2012, there has been both extensive research in order to understand their population structure and distributions, and conservation plans for these species.

Legislation and policy

At the policy and legislation level, a wide range international treaties, legislation, conventions and agreements are already in place to promote the protection of cetaceans and their habitats in the Mediterranean region:

- **Convention on Biological Diversity (CBD).** A [review](#) of available technologies to reduce the impacts of anthropogenic underwater noise on marine and coastal biodiversity has been produced by the CBD. A range of existing management frameworks for the marine environment that currently consider underwater noise or have the potential to do so are provided. These include marine spatial planning approaches as part of an overall ecosystem-based management strategy that considers multiple stressors, and risk or impact assessments, usually for particular species of concern. The standards were investigated to reduce underwater noise pollution.
- **Convention on the Conservation of Migratory Species of Wild Animals (CMS, or the Bonn Convention).** All the assessed Mediterranean cetacean subpopulations are included in the CMS Appendices (Appendix I – Endangered migratory species, and Appendix II - Migratory species conserved through Agreements), with the exception of the Long-finned pilot whale and the Rough-toothed Dolphin.
- **Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS).** ACCOBAMS was created under the auspices of the Bonn Convention. Numerous research initiatives and conservation actions are undertaken under the auspices of ACCOBAMS, including the ACCOBAMS Survey Initiative (ACCOBAMS, 2021b), whose findings greatly contributed to the recent Red List reassessments.
- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).**
- **Convention on the Conservation of European Wildlife and Natural Habitats (BCCEW, or the Bern Convention).**
- **Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention),** with the Mediterranean Action Plan (MAP) and the Protocol Concerning Specially Protected Areas and Biological Diversity of the Barcelona Convention (Mediterranean region) (SPA Protocol).
- **International Convention for the Regulation of Whaling (ICRW),** the Convention responsible for establishing the International Whaling Commission (IWC).
- **The Marine Strategy Framework Directive (MSFD; Directive 2008/56/EC)** is an EU Directive adopted in 2008 to achieve a Good Environmental Status in the EU’s marine waters and to protect resources of socio-economic interest. EU funding has supported the implementation of the MSFD through specific collaborative projects, such as [ABIOMMED](#) to support coherent and coordinated assessment of biodiversity and measures across Mediterranean, and [QuietSeas](#) to assist regional cooperation for the practical implementation of the MSFD in relation to underwater noise.
- **European Council Regulation (EC) No 338/97** on the protection of species of wild fauna and flora and related Regulations (the **Wildlife Trade Regulations**) prevent or restrict the trade
- **European Council Directive 92/43/EEC** on the Conservation of Natural Habitats and of Wild Flora and Fauna (**EU Habitats Directive**). All cetacean species are listed on Annex IV (Strict protection of species) of the Habitats Directive. This Directive requires effective measures to prevent the negative impact of fishing activities (primarily as bycatch, the incidental capture of cetaceans) on cetaceans, with monitoring requirements and catch thresholds set ensuring compliance. The Directive also requires effective measures to prevent the negative impact of shipping on cetaceans (ship strikes and underwater noise). The effective implementation of the Habitat Directive with respect to cetaceans has been questioned by some (for example, Rogan et al., 2021).

Table 4.
Conservation status and international agreements concerning cetacean species of the Mediterranean Sea

Family	Scientific name	Subpopulation	IUCN Red List Category and Criteria				International Legal Instruments
			Global		Med.		
			Cat.	Crit.	Cat.	Crit.	
Balaenopteridae	<i>Balaenoptera physalus</i>	Mediterranean subpopulation	VU	A1d	EN	C2a(ii)	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix I CMS: Appendices I and II GFCM/36/2012/2
	<i>Delphinus delphis</i>	Inner Mediterranean subpopulation	LC		EN	A2cde; C1	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II CMS: Appendices I and II GFCM/36/2012/2
	Gulf of Corinth subpopulation			CR	D		
Delphinidae	<i>Globicephala melas</i>	Inner Mediterranean subpopulation	LC		EN	C2a(ii)	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II GFCM/36/2012/2
		Strait of Gibraltar subpopulation			CR	C2a(ii)	
	<i>Grampus griseus</i>	Mediterranean subpopulation	LC		EN	A2bc	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II CMS: Appendix II GFCM/36/2012/2
	<i>Orcinus orca</i>	Strait of Gibraltar subpopulation	DD		CR	C2a(i,ii); D	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II CMS: Appendix II GFCM/36/2012/2

Family	Scientific name	Subpopulation	IUCN Red List Category and Criteria				International Legal Instruments
			Global		Med.		
			Cat.	Crit.	Cat.	Crit.	
Delphinidae	<i>Stenella coeruleoalba</i>	Mediterranean subpopulation	LC		LC	B1ab(iii)	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II CMS: Appendix II GFCM/36/2012/2
		Gulf of Corinth subpopulation			EN		
	<i>Steno bredanensis</i>	Mediterranean subpopulation	LC		NT	D1	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II GFCM/36/2012/2
	<i>Tursiops truncatus</i>	Mediterranean subpopulation	LC		LC	C2a(ii)	EU Habitats Directive: Annex II ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II CMS: Appendix II GFCM/36/2012/2
Gulf of Ambracia subpopulation		CR					
Physeteridae	<i>Physeter macrocephalus</i>	Mediterranean subpopulation	VU	A1d	EN	C2a(ii)	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix I CMS: Appendices I and II GFCM/36/2012/2
Ziphiidae	<i>Ziphius cavirostris</i>	Mediterranean subpopulation	LC		VU	C2a(ii)	EU Habitats Directive: Annex IV ACCOBAMS, SPA/BD PROTOCOL: Annex II BCCEW: Appendix II BARCOM: Appendix I CITES: Appendix II CMS: Appendix I GFCM/36/2012/2

Red List categories (CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated).
Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023.

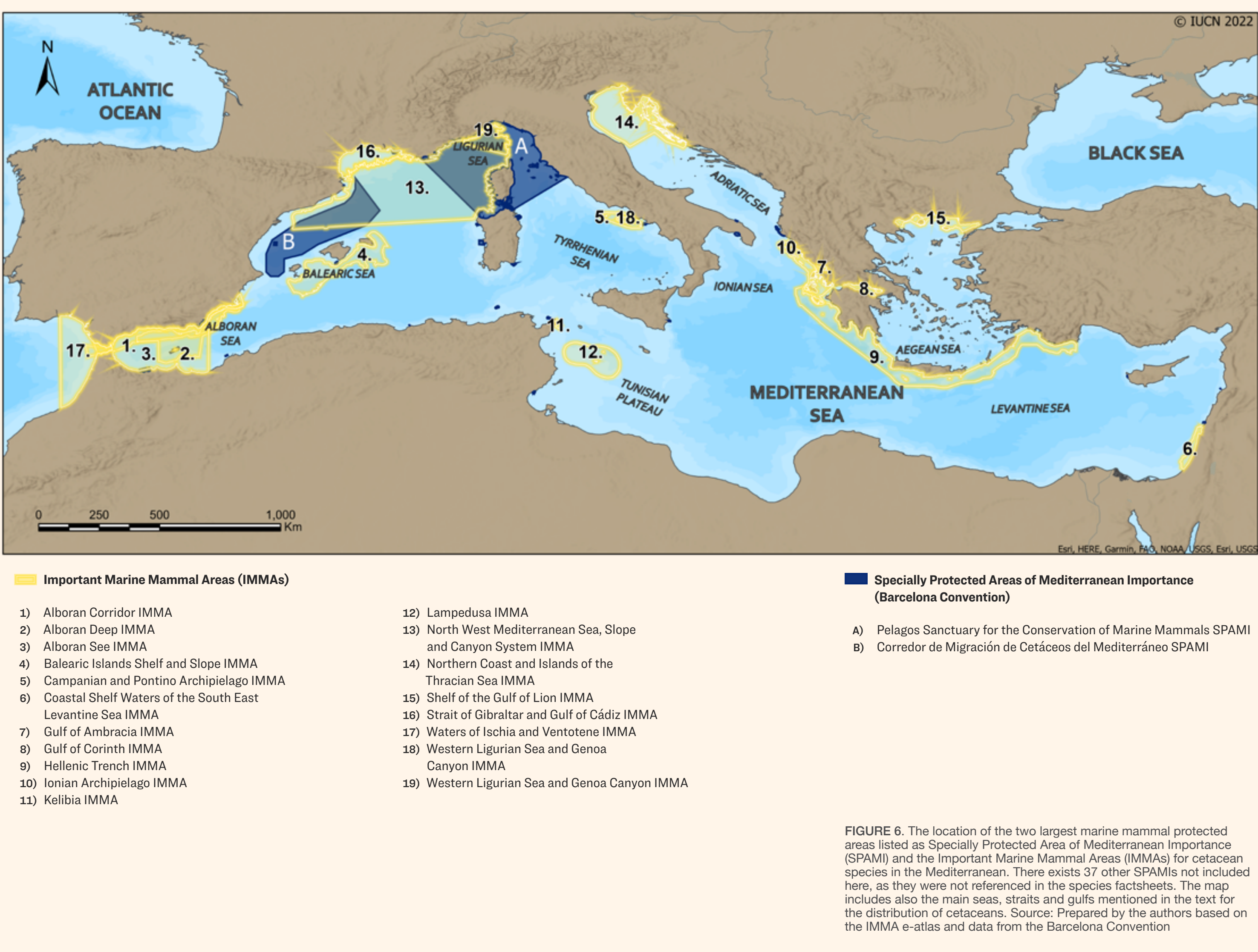
Marine protected areas

Marine protected areas (MPAs) can play a key role in conserving key cetacean habitats, such as feeding and migration corridors. At present, there are two large marine mammal protected areas in the Mediterranean listed as Specially Protected Area of Mediterranean Importance (SPAMI) (Figure 6). SPAMIs have been established by the Contracting Parties to the Barcelona Convention through the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol), in order to promote cooperation in the management and conservation of natural areas, as well as in the protection of threatened species and their habitats. All the Parties to the SPA/BD Protocol are committed to respect the protection and conservation measures defined in the proposal for inclusion. The largest (87,500 km2) is the “Pelagos Sanctuary for The Conservation of Marine Mammals”, listed as a SPAMI since 2001, and it encompasses key Fin whale feeding areas in the northern Mediterranean between France, Monaco and Italy. The second site is the “Corredor de Migración de Cetáceos del Mediterráneo” (46,614 km2), between the Balearic Islands and the Spanish mainland, which was declared in 2018 and formally approved as a SPAMI in 2019.

In addition, a total of 19 Important Marine Mammal Areas (IMMAs) (Figure 6) and 5 candidate IMMA (Central Tyrrhenian Sea cIMMA, North East Ionian Sea cIMMA, Central Southern Adriatic cIMMA, East Sicily and Strait of Messina cIMMA and Waters Surrounding the Maltese Islands cIMMA), have been identified for cetaceans in the Mediterranean Sea, that could potentially lead towards the establishment of new Marine Protected Areas (MPAs) and/or other conservation measures. For example, Particularly Sensitive Sea Areas (PSSAs) under the framework of the International Maritime Organization (IMO) should be established in identified areas of high risk for ship strikes.

ACCOBAMS is working on the identification of new relevant Cetaceans Critical Habitats (CCH) in the Mediterranean Sea, linking with the IMMA process developed by the IUCN Marine Mammal Protected Areas Task Force. The outcomes of the CCH/IMMA processes will facilitate the identification of new MPAs and the extension of existing MPAs to promote connectivity and develop a coherent regional MPA network.

The value of national and regional-level MPAs (such as the European Union’s Natura 2000 network) to cetacean conservation is uncertain, as these are usually much smaller in area, and may not effectively protect highly mobile and adaptable marine species such as cetaceans, unless very large areas are designated as Site of Community Importance (SCIs) (Fortuna et al., 2018).



Conservation action

The reassessments of the 12 Mediterranean endemic subpopulations identified the most common required conservation actions (Figure 7). Legislation – the development of new legislation and the effective enforcement of existing legislation – comprise three of the top four required conservation actions.

The development and implementation of robust management plans for the conservation of these species should be an urgent priority. The emphasis should be on improving our existing knowledge, creating a more integrated approach to marine and coastal activities around the Mediterranean, thus providing a better environment for marine mammals. Management of threatened species and their environment can be improved by:

- Identifying and implementing other specific measures, such as seasonal closures of fishing areas, reductions in fishing effort in certain fisheries.
- Developing and implementing Conservation and Management Plans for cetaceans throughout the entire Mediterranean Sea: ACCOBAMS has developed Conservation and Management Plans for Fin Whales, Risso’s Dolphins, Bottlenose dolphins and Common Dolphins, and were presented at the ACCOBAMS MOP in Malta in November 2022. Conservation and Management Plans for Sperm whales and Cuvier’s beaked whales are to be developed.
- Enforcing the existing national and international legislation on fishing techniques, coastal development, marine resource exploitation and protected sites and species.
- Increasing efforts to identify Important Marine Mammal Areas (IMMAs) and Cetacean Critical Habitats (CCHs) and establish conservation areas that cover the full range of resident or frequently visited sites for the various species of cetaceans.
- Systematically monitoring abundance and trends to allow the prompt identification of criticisms.
- Developing a comprehensive outreach and education strategy to promote responsible viewing of wild marine mammals by public opinion, tourists and commercial operators.
- Limiting the spread and intensity of harmful noise by restricting activities producing underwater sounds emissions, adapting vessels and other human activities at sea to help to mitigate the effects on cetaceans. Implementing and supporting existing Directives (such as MSFD), agreements, best practices or guidelines (e.g. ACCOBAMS, CMS, IUCN, UN) on noise issues.
- Reduced inputs of particular pollutants, and monitoring for the prevalence of morbillivirus infection.

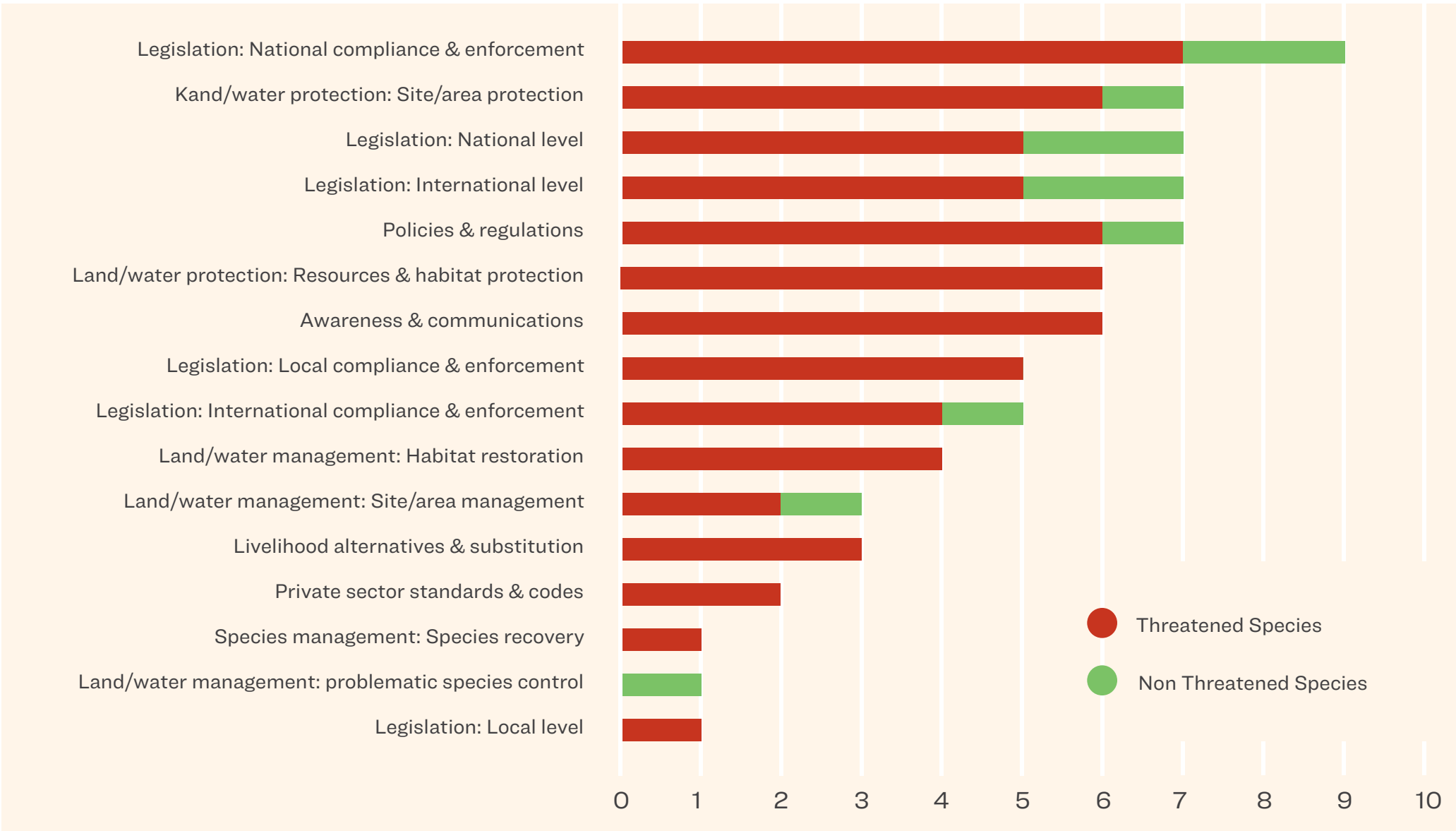


FIGURE 7. The most frequently required conservation actions identified for Mediterranean endemic cetacean subpopulations. Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023.

5. Research needed

The significant impact on these recent reassessments of Mediterranean cetacean subpopulations of the extensive new basin-wide data compiled through the ACCOBAMS Survey Initiative (ACCOBAMS, 2021b) shows the significance of data to understand the extinction risk of species, and to then develop conservation actions to address that risk. Figure 8 shows the primary research needs for the assessed Mediterranean cetaceans.

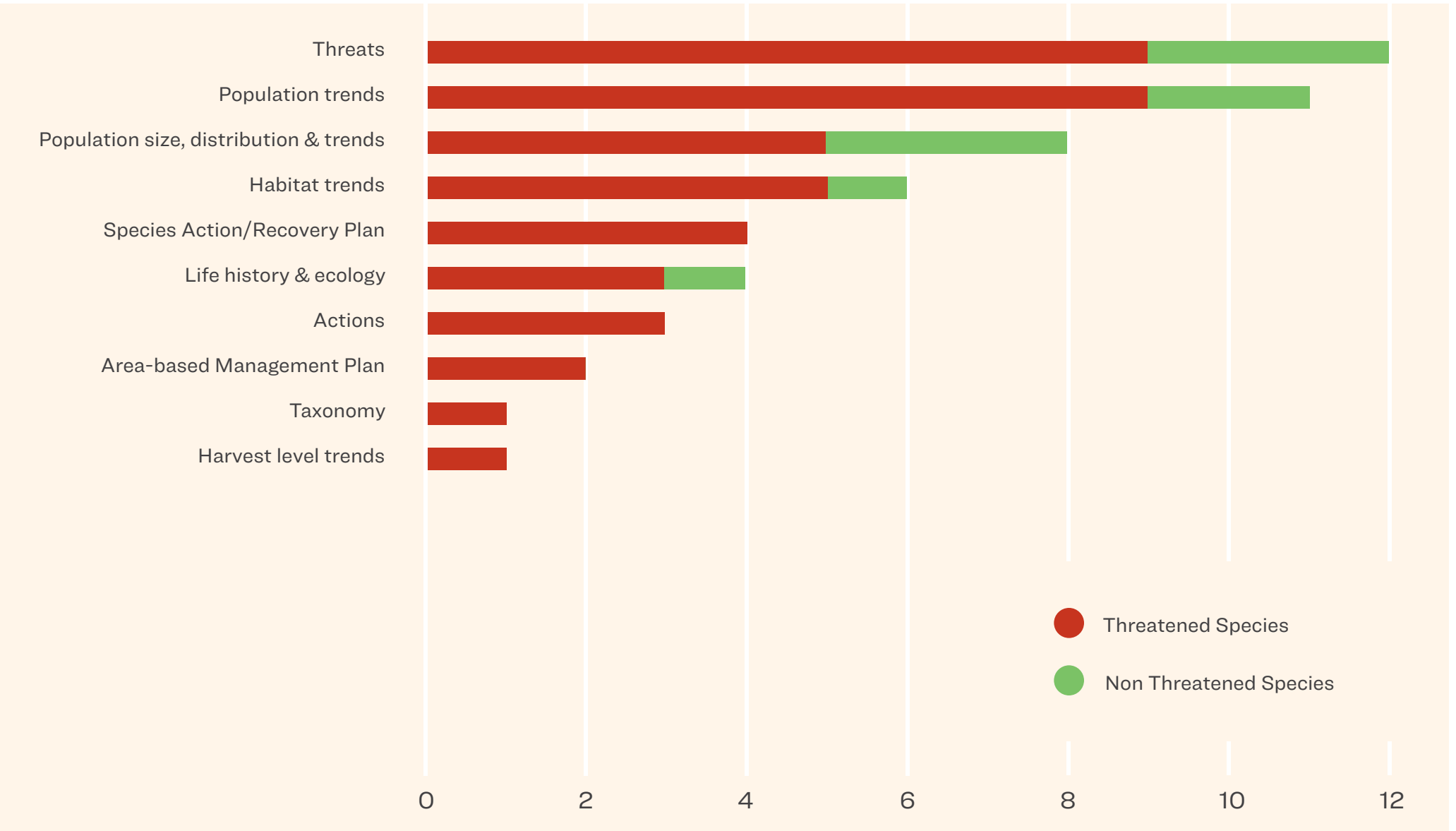


FIGURE 8. The most urgent research needed for Mediterranean endemic cetacean subpopulations. Source: The IUCN Red List of Threatened Species 2023. <https://www.iucnredlist.org>. Accessed on 15 July 2023.

6. Conclusions: Conservation status of cetaceans and international agreements after 10 years

This report represents the second regional IUCN Red List assessment on the cetacean species in the Mediterranean Sea. In total, 24 cetacean species have been recorded in the Mediterranean Sea, of which 10 species are considered resident divided into 13 subpopulations. Ten resident Mediterranean subpopulations of cetaceans (77%) are considered to be threatened with extinction. The highest species richness of cetaceans can be found in the Western part of the Mediterranean, especially in the Alboran Sea close to the Strait of Gibraltar, in the Balearic Sea off the coast from Spain, along the coast of Sicily and in the Ionian Sea off the coast from Peloponnese in Greece and close to the Gulfs of Corinth and Ambracia. Thanks to monitoring programs and the collaborative work of experts, more information is available about the distribution, demography and genetics of cetaceans in the Mediterranean Sea. This has improved the accuracy of the assessments and led to the identification of new subpopulations of cetaceans.

Over the last decade, the Main threats to Mediterranean cetacean subpopulations have remained more or less the same. The principal threat is still fishery-related mortality, including bycatch, driftnets and competition for food stocks. There is an urgent need for the implementation of a systematic cetacean bycatch monitoring system in the Mediterranean.

Another remaining major threat for cetacean subpopulation is pollution, both from industrial and domestic effluents, impacting nine subpopulations (7 of them threatened) in the Mediterranean Sea. High concentrations of organic contaminants (such as DDTs and PCBs) and heavy metals (such as mercury and cadmium) are affecting the survival of Mediterranean cetacean subpopulations. Especially for the cetacean subpopulations in the semi-enclosed gulfs with lower water exchange (such as Gulf of Corinth and Ambracia), massive disposal of residue of pollutants can result in toxicological problems.

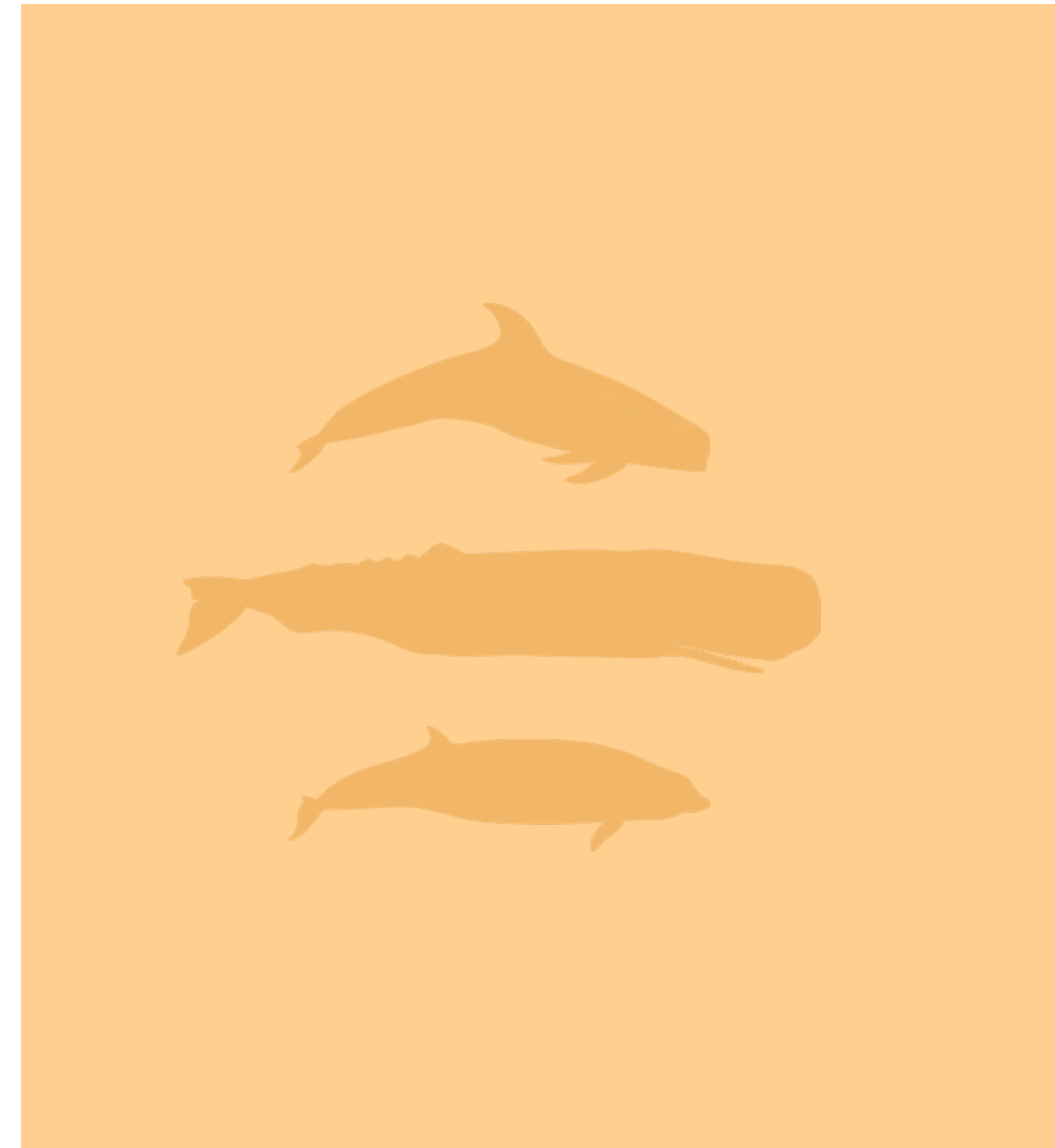
Unlike a decade ago (IUCN, 2012b), there are strong indications that noise pollution is a very significant threat, impacting ten (including nine threatened subpopulations) of the 12 assessed subpopulations. Cetaceans are exposed to underwater noise from various sources, resulting in displacement, habitat exclusion and behavioural modifications. Noise can mask sounds relevant to cetacean communication and foraging, causing

disturbance and stress, and reducing their ability to avoid ship collisions. Finally, loud noise can result in hearing harm as well as mortality of deep-diving cetaceans.

There is an urgent need for robust management plans for the conservation of cetaceans. Management of threatened species and their environment can be improved by the development of new legislation and more importantly, the effective enforcement of the existing legislation on fishing techniques, coastal development, marine resource exploitation and protected sites and species. Furthermore, there is a need for improving existing knowledge and creating a more integrated approach to marine and coastal activities. Finally, the spread and intensity of harmful noise can be limited by restricting activities producing underwater sounds emissions and improved measures should be put in place to reduce the inputs of pollutants in the Mediterranean Sea.

This Red List report is the evidence that more efforts are needed to halt further population decrease of cetacean species in the Mediterranean Sea.

7. Mediterranean whale and dolphin factsheets



FIN WHALE

ES: Rorcual común | FR: Rorqual commun | AR: الحوت الشائع

Balaenoptera physalus
Artiodactyla / Balaenopteridae

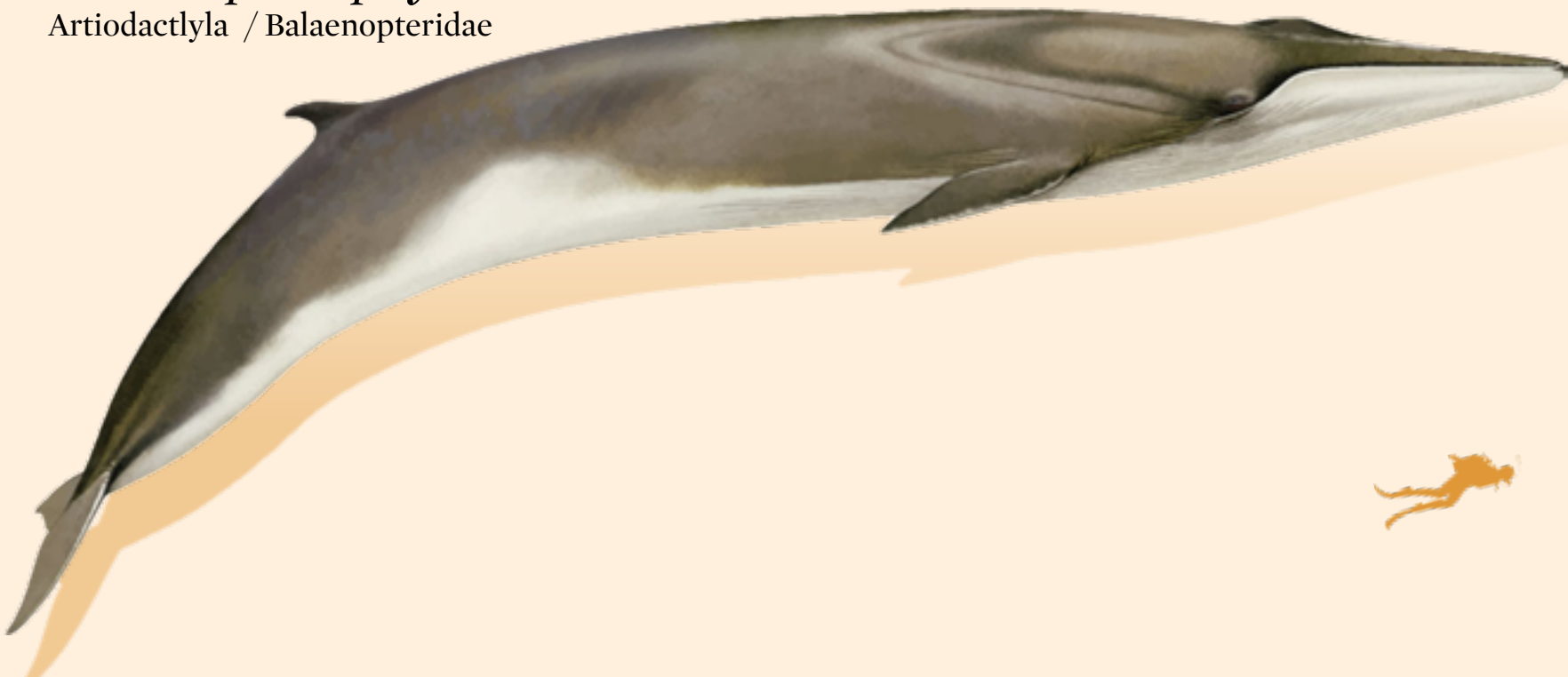


Illustration by Massimo Demma

Mediterranean subpopulation

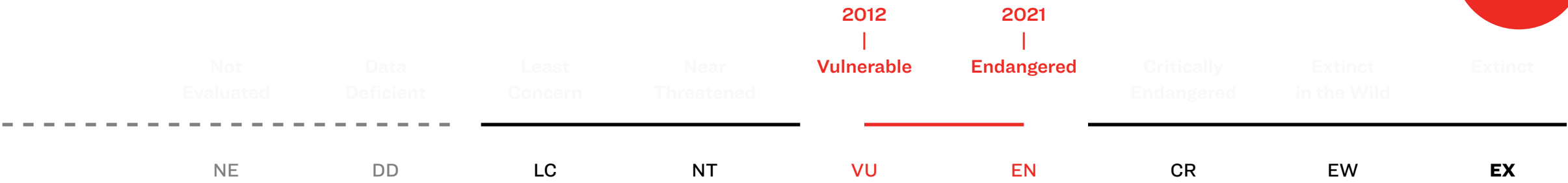


FIGURE 9. The distribution of the Fin whale (*Balaenoptera physalus*) Mediterranean subpopulation, showing the IMMAs designated for this species. Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

- Extant (resident)
- Extant (seasonality uncertain)
- Extant & Vagrant (seasonality uncertain)

- Important Marine Mammal Areas (IMMA)
- 1) Alboran Corridor IMMA
 - 2) North West Mediterranean Sea, Slope and Canyon System IMMA
 - 3) Waters of Ischia and Ventotene IMMA
 - 4) Lampedusa IMMA

Mediterranean subpopulation



IUCN RED LIST

Year 2012
Category Vulnerable
Criteria C2a(ii)



In 2012, the Mediterranean subpopulation, which is genetically distinct from Fin whales in the North East Atlantic, contained fewer than 10 000 mature individuals or adults (VU). It also experienced an inferred continuing decline in the number of adults (C2) and all mature individuals were considered in one subpopulation (a(ii)).

The population decline was due to human-induced mortality from vessel collisions and bycatch in fishing gear, but also by disturbance caused by growing whale watching activities.

Source: Panigada, S. & Notarbartolo di Sciara, G. 2012. *Balaenoptera physalus* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012
<https://www.iucnredlist.org/species/16208224/17549588>

Year 2021
Category Endangered
Criteria C2a(ii)



Recent and synoptic effort - based on line-transect distance sampling surveys in summer 2018 within the ACCOBAMS Survey Initiative - has resulted in a corrected estimate of 3,282 (CV=30.85%) Fin whales (ACCOBAMS 2021b). Since the 2012 assessment, the population of Fin whales has continued to decline reaching the threshold of less than 2,500 mature individuals in a single population (48% of the total population being mature: Taylor et al., 2007), thus qualifying as Endangered.

The inferred decline of the population still mainly depends on observed human-induced mortality such as ship strikes, as in 2012, plus a variety of threats, including disturbance caused by maritime traffic (i.e., underwater noise and growing whale watching activities), as well as the noxious exposure to increasing levels of micro and nano plastics.

Depth range and ecology

Fin whales are present most commonly in deep waters (400 to 2500 m), but they can occur in slope and continental shelf waters as well.

This species feeds predominantly on zooplankton in the Mediterranean Sea. In general, Fin whale feeding activity in the Mediterranean tend to concentrate in specific areas, characterised by frontal systems and upwelling currents, such as the Pelagos Sanctuary during the summer months, and the Catalan Coast during spring. In the winter months, they are more dispersed throughout the western Mediterranean Sea and possibly beyond, towards the central basin, including the North African coast.

Movements of the species between the Mediterranean and the Atlantic is estimated to be relatively low and there is evidence of some migration to Spanish and Portuguese Atlantic waters in the summer.

Main threats

The number of large commercial vessels crossing the Mediterranean is on the rise, and it is one of the main current threats to the species, due to ship strikes: the Pelagos Sanctuary, the Strait of Gibraltar and the Balearic Sea are high risk areas. Besides, shipping noise and vessel disturbance may cause additional stress to Fin Whales.

Seismic activities (using airguns) for search and exploitation of oil and gas have also been shown to disturb Fin whales in wintering grounds, with potential detrimental effects on the population.

Persistent Organic Pollutants (POPs), coupled with high levels of micro and nano plastics found in the water column, may negatively influence the population by affecting its reproductive output and weakening the immune system.

Climate change and acidification of the sea may potentially affect the abundance of their prey (e.g., zooplankton) and have negative effects on their fitness.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

At present, there are two large marine mammal protected areas in the Mediterranean listed as SPAMI (Figure 6). The Pelagos Sanctuary in the northern Mediterranean encompasses key Fin whale feeding areas in portions of the Provençal, Corsican, Ligurian, Tyrrhenian and northern Sardinian Seas, and the “Corredor de Migración de Cetáceos del Mediterráneo” forms part of the migration corridor for Fin whales between their breeding and feeding areas in the northwestern Mediterranean Sea.

In addition, four IMMAs and two candidate IMMA (Central Tyrrhenian Sea cIMMA and North East Ionian Sea cIMMA) for Fin Whales have been identified in the Mediterranean Sea (Figure 9), that could potentially lead towards the establishment of new Marine Protected Areas and/or other conservation measures. International Maritime Organization (IMO) ‘Particularly Sensitive Sea Areas’ (PSSAs) should be established for this species in areas of high risk for ship strike.

In the Strait of Gibraltar, Fin whales could benefit from the modification of the Traffic Separation Scheme (TSS) implemented in 2007 with the specific purpose of reducing the risk of collisions between Sperm whales and vessels. The measure includes a security area where crossing ships are recommended to limit their speed to 13 knots or slower from April to August and to navigate with particular caution. However, this measure is only seasonal and not mandatory, so that migrating Fin whales that use this area in both summer and winter are effectively unprotected.

Source: Panigada, S., Gauffier, P. & Notarbartolo di Sciara, G. 2021. *Balaenoptera physalus* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: [e.T16208224A50387979](https://www.iucnredlist.org/species/16208224/17549588).

COMMON DOLPHIN

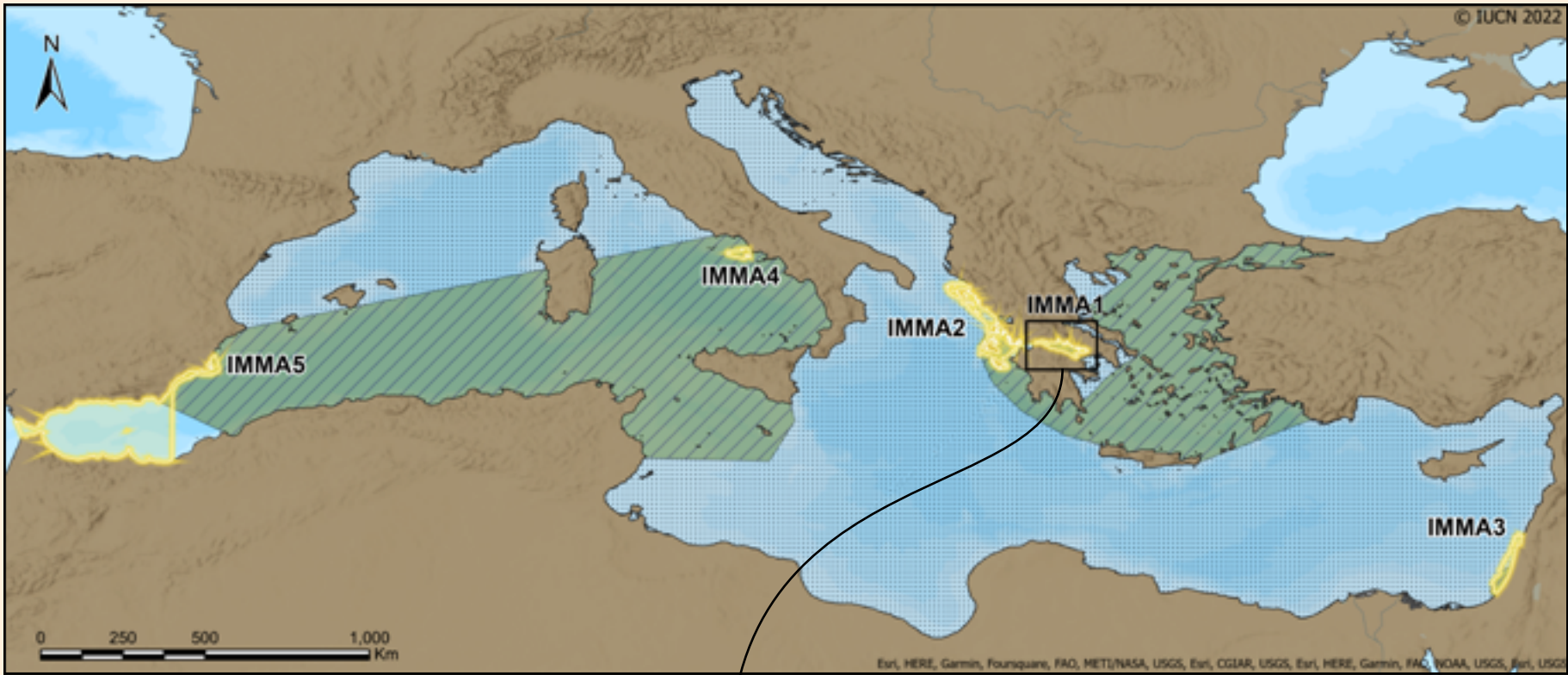
ES: Delfín común | FR: Dauphin commun | AR: دلفين مألوف قصير المنقار

Delphinus delphis
Artiodactyla / Delphinidae



Illustration by Massimo Demma

Inner Mediterranean subpopulation



Gulf of Corinth subpopulation

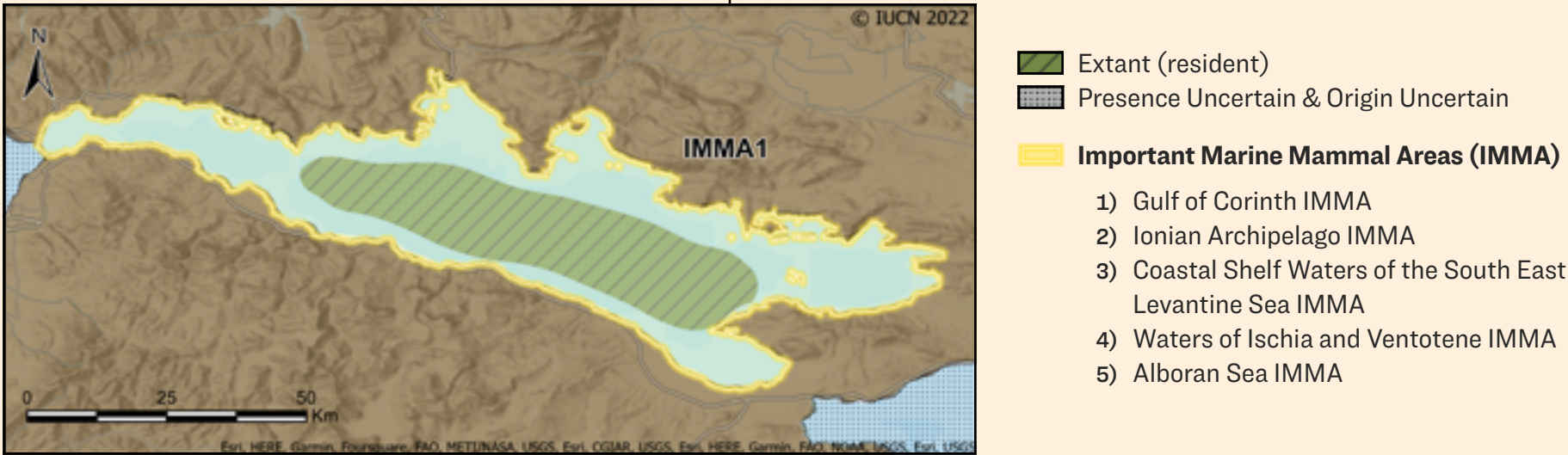
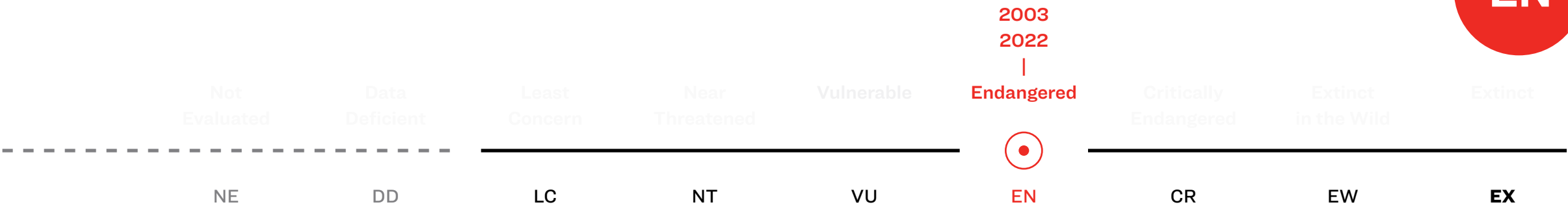


FIGURE 10. The distribution of the Common dolphin (*Delphinus delphis*) Inner Mediterranean and Gulf of Corinth subpopulation, showing the IMMA designated for this species.
Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

Inner Mediterranean subpopulation



IUCN RED LIST

Year **2003**
Category **Endangered**
Criteria **A2abc**



In 2003, it was assessed that Common dolphins were threatened by a variety of factors, such as overfishing, habitat degradation, fishery bycatch and xenobiotic contamination. A reduction of the population of 50% over a three-generation period (30–45 years) was inferred. The species experienced a decline 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) was available to demonstrate a numerical decline, there was 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.

Source: Bearzi, G. 2003. *Delphinus delphis* (Mediterranean subpopulation). *The IUCN Red List of Threatened Species* 2003
<https://dx.doi.org/10.2305/IUCN.UK.2003.RLTS.T41762A10557372.en>.

Year **2022**
Category **Endangered**
Criteria **C2a(ii)**



Since the last assessment the Mediterranean population of *D. delphis* has been further characterised and defined. The inner Mediterranean subpopulation does not consider the waters west of the Almería-Orán thermohaline front, identified as an environmental boundary that drives genetic differentiation between the Mediterranean individuals of Common dolphins occurring east of the front, and a north-eastern Atlantic population that also utilises the Mediterranean waters of the Alborán Sea. Estimates suggest that there may be less than 2500 mature individuals. The estimated decline of the subpopulation is around 5-10% annually, corresponding to a 20% decline in 2 generations (C1). The causes of this decline have not ceased and may not be reversible (A2cde).

Depth range and ecology

Common dolphins in the inner Mediterranean prefer continental shelf and continental slope waters, though in some areas they occur in deep waters. The sparse information on diet preferences indicates relatively flexible feeding habits, and key prey may vary across areas. Epipelagic and mesopelagic fish such as Clupeidae and Myctophidae appear to be the preferred prey.

Mixed-species groups of Common dolphins and Striped dolphins (*Stenella coeruleoalba*) occur regularly in several inner Mediterranean areas. In the Gulf of Corinth, Greece, single-species groups of Common dolphins were never encountered and the species occurs exclusively in mixed groups with Striped Dolphins. Common dolphins appear to associate less frequently with other cetacean species.

In the past, Mediterranean Common dolphins used to be found in groups of 50–70 animals, with much larger aggregations occasionally recorded. However, group sizes appear to have decreased dramatically in recent decades. Recent information indicates mean group sizes of less than 10–20 individuals through much of the inner Mediterranean.

Main threats

The practice of killing small cetaceans was widespread until the 1960s. Culling and killing efforts likely triggered a decline of Common Dolphins, which continued in the following decades as a result of bycatch in fishing gear, prey depletion caused by overfishing and other threats. In the 1990s, bycatch of Common dolphins in driftnets has likely resulted in high mortality. Prey depletion is another factor that may have concurred to the decline in the Mediterranean—the most overfished sea in the world. Contamination through the food web may expose Common dolphins to the Immunotoxic and other detrimental effects of persistent environmental pollutants, but the effects are poorly understood. Intensive sounds such as those produced by military sonars and seismic surveys have potentially significant negative effects. The effects of climate change are largely

unknown. Hybridisation with Striped dolphins may be an important threat within Mediterranean areas where Common dolphins associate and potentially inter-breed with Striped Dolphins.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

An Action Plan commissioned by ACCOBAMS in 2004 considers Mediterranean Common dolphins as an endangered population, and measures to protect them were identified. In 2005, the entire Mediterranean population of Common dolphins was included in Appendices I and II of the Convention on the Conservation of Migratory Species (Bonn Convention - CMS).

All the measures above have so far failed to provide benefits to Common dolphins on a scale suitable to stop or reverse their decline. More conservation actions are needed to protect Common dolphins primarily through mitigation of threats posed by fishing, noise from seismic surveys and military sonars, and pollution.

NOTE: this assessment names this subpopulation “Inner Mediterranean”, and does not consider the waters west of the Almería-Orán thermohaline front, identified as an environmental boundary that drives genetic differentiation between the Mediterranean population of Common dolphins occurring east of the front, and a north-eastern Atlantic population that also utilises the Mediterranean waters of the Alborán Sea.

Source: Bearzi, G., Genov, T., Natoli, A., Gonzalvo, J. & Pierce, G.J. 2022. *Delphinus delphis* (Inner Mediterranean subpopulation) (errata version published in 2022). *The IUCN Red List of Threatened Species* 2022: [e.T189865869A210844387](https://dx.doi.org/10.2305/IUCN.UK.2022.RLTS.T189865869A210844387).

COMMON DOLPHIN

ES: Delfín común | FR: Dauphin commun | AR: دلفين مألوف قصير المنقار

Delphinus delphis
Artiodactyla / Delphinidae

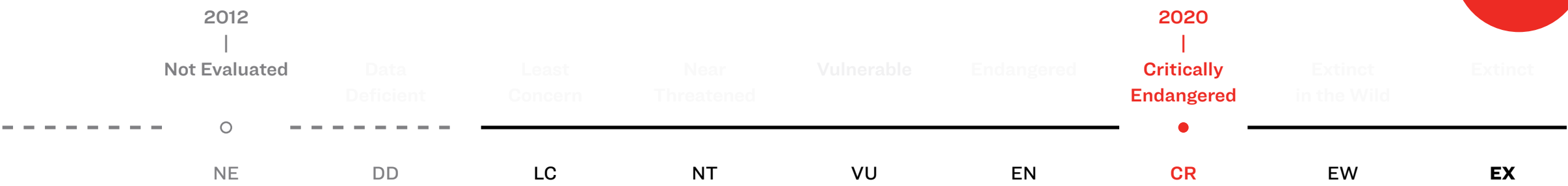


The common dolphin is classified as Critically Endangered in the Gulf of Corinth. © Giovanni Bearzi, Dolphin Biology and Conservation



Common dolphins from the Gulf of Corinth © Giovanni Bearzi, Dolphin Biology and Conservation

Gulf of Corinth subpopulation



IUCN RED LIST

Year 2012
Category Not Evaluated

Year 2020
Category Critically Endangered
Criteria D ?

Since the last assessment in the Mediterranean, fewer than 50 mature individuals exist in the subpopulation. Common dolphins experience a variety of threats in the Gulf of Corinth. These include prey depletion, food-web competition and habitat degradation caused by fishing, exposure to pollutants and acoustic disturbance.

Depth range and ecology

Common dolphins in Greece normally prefer continental shelf waters where they target epipelagic schooling fish. In the Gulf of Corinth, their preference for deep waters is consistent with the hypothesis of Common dolphins having modified their behaviour and habitat preferences to live in mixed-species groups with Striped dolphins (*Stenella coeruleoalba*).

Common dolphins scattered within large Striped dolphin groups were never observed schooling and chasing epipelagic fish at the surface (a typical behaviour of Common dolphins in other Mediterranean areas). Sharing deep-water habitat with Striped dolphins and perhaps adapting to their foraging behaviour may have come at a cost for Common Dolphins, considering that the two species have different diets and Common dolphins have higher metabolic rates.

Main threats

While there is virtually no information on the occurrence of bycatch within the Gulf of Corinth, Common dolphin mortality in fishing gear has been recorded in the eastern Ionian Sea areas and in other areas of Greece. Reduced availability of important prey caused by overfishing has long been identified as one of the primary reasons behind the dramatic decline of Common dolphins in the Mediterranean, particularly in western Greece. The food-web damage caused by excessive fishing combines with the biological damage to the seabed caused by destructive fishing practices. Colossal amounts of hazardous industrial waste have been dumped into the Gulf for over half a century.

Common dolphin habitat overlaps with areas of massive disposal of residue from extraction of aluminium (“red mud”), including iron oxides, aluminium and titanium. Indirect effects such as contamination up the food web are possible, considering the immunotoxin and other detrimental effects of environmental pollutants. Other ongoing threats to Gulf of Corinth Common dolphins include anthropogenic noise caused by geophysical research and seismic surveys.

Finally, the recently confirmed hybridisation with 60-fold more abundant Striped dolphins threatens the persistence of Common dolphins in the Gulf of Corinth. It has been suggested that the steep decline of Common dolphins caused by human activities has led to a scarcity of potential mates, and this likely contributed to the observed breeding and admixture with Striped Dolphins. Hybridisation and introgression increase the probability of extinction through genetic and demographic swamping.

Current conservation measures

For a comprehensive list of the international agreements that protect this taxon, see Table 4.

The semi-enclosed Gulf of Corinth is one of 26 areas characterised as **IMMAs** in the Mediterranean region (see Figure 10). Its inclusion was based on the occurrence of isolated populations of Common dolphins and Striped Dolphins. Earlier on, in 2007, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS), ratified by Greece, had already listed the Gulf of Corinth as an area of special importance for Common dolphins and other cetaceans, calling for the creation of a Marine Protected Area. In February 2018 the entire Gulf of Corinth was included in the EU Natura 2000 network.

Fisheries management measures aimed at the recovery of depleted fish stocks should be implemented and enforced without delay in the Gulf of Corinth, targeting as a matter of priority those commercial fisheries known to cause food-web damage and deplete Common dolphin prey, including seiners and trawlers. Underwater noise (e.g. caused by geoseismic surveys) should be avoided. Pollutant discharges should be curtailed (also considering the large amount of industrial waste discharged into the Gulf over the past 50 years).

The repeatedly advocated creation of a Marine Protected Area in the Gulf of Corinth could contribute to the recovery and long-term survival of Common Dolphins, as long as protection includes a total ban of purse seining, beach seining and trawling and a strict enforcement.

Source: Bearzi, G., Bonizzoni, S. & Santostasi, N.L. 2020. *Delphinus delphis* (Gulf of Corinth subpopulation) (errata version published in 2021). *The IUCN Red List of Threatened Species* 2020: [e.T156206333A194321818](https://doi.org/10.2305/2020.156206333A194321818).

LONG-FINNED PILOT WHALE

ES: Calderón común | FR: Globicéphale noir | AR: حوت طيار طويل الزعانف

Globicephala melas
Artiodactyla / Delphinidae

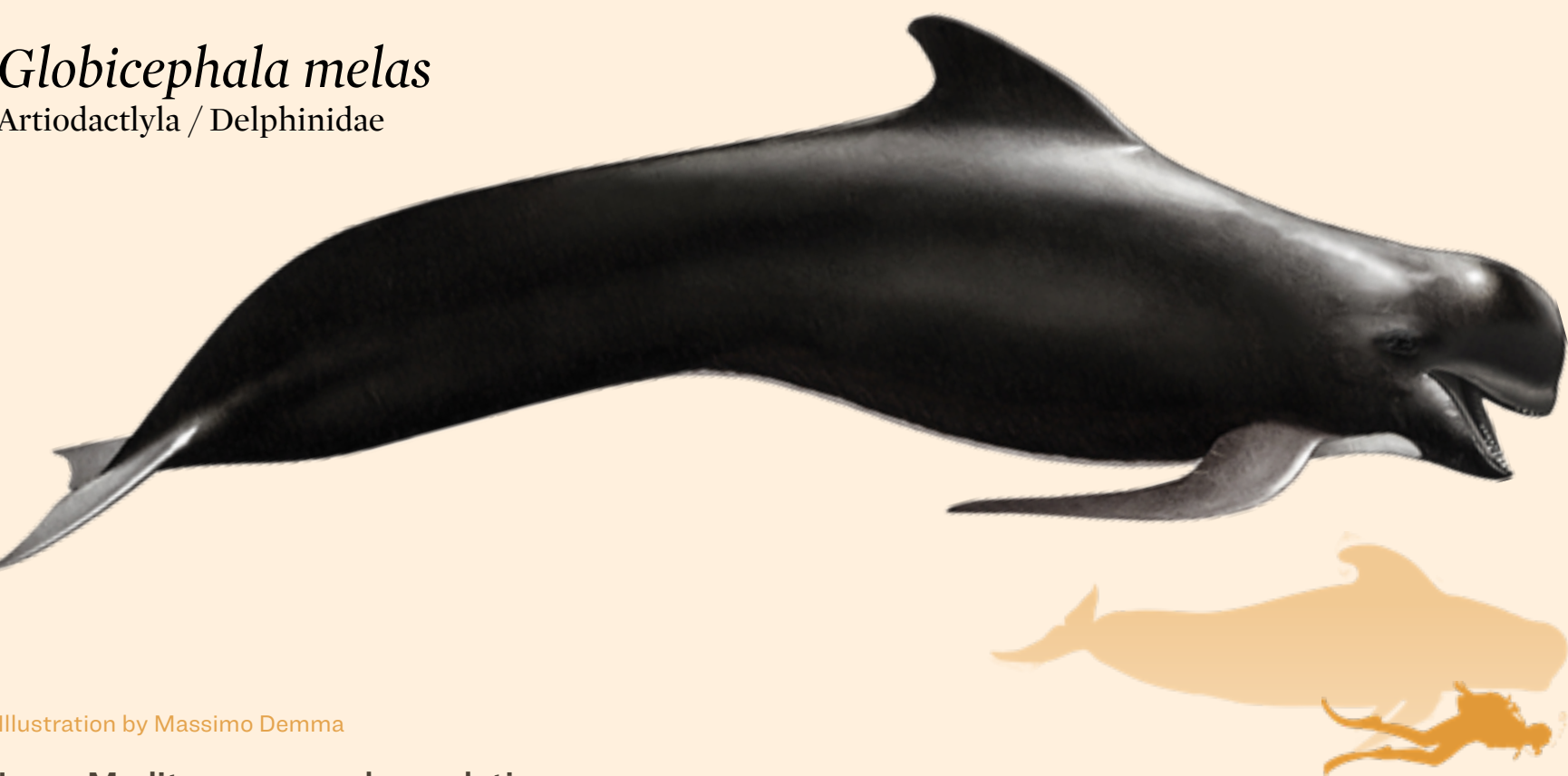
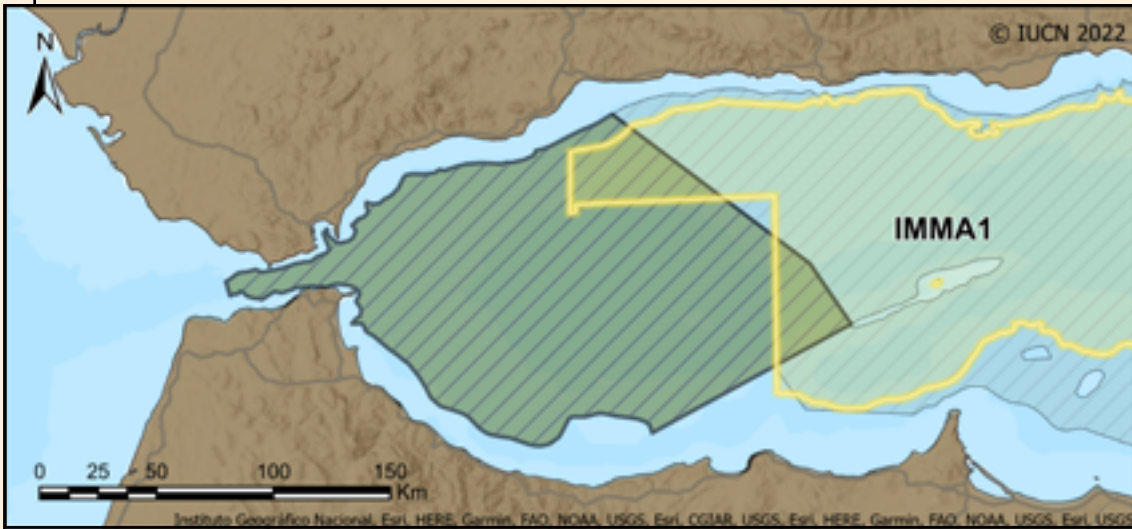


Illustration by Massimo Demma

Inner Mediterranean subpopulation



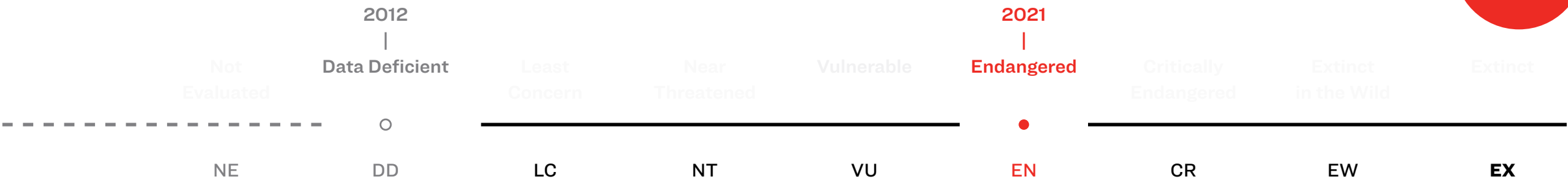
Strait of Gibraltar subpopulation



- Extant (resident)
- Extant & Vagrant (seasonality uncertain)
- Possibly Extant & Vagrant (seasonality uncertain)
- Important Marine Mammal Areas (IMMA)
 - 1) Alboran Deep IMMA

FIGURE 11. The distribution of the Long-finned pilot whale (*Globicephala melas*) Inner Mediterranean and Strait of Gibraltar subpopulation, showing the IMMA designated for this species.
Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

Inner Mediterranean subpopulation



IUCN RED LIST

Year **2012**
Category **Data Deficient**

Appropriate data are not available on the species' biology, distribution and abundance in the Mediterranean region. Therefore, it is impossible to assess either directly or indirectly the conservation status of the species.

Source: Cañadas, A. (2012a). *Globicephala melas* (Mediterranean assessment). *The IUCN Red List of Threatened Species* 2012
<https://www.iucnredlist.org/species/9250/3150309>

Year **2021**
Category **Endangered**
Criteria **C2a(ii)**



The Mediterranean subpopulation of the Long-finned pilot whale was first assessed in 2010 as Data Deficient as a result of the absence of data on the species' biology, distribution and abundance across much of the Mediterranean region. In the current assessment, two Mediterranean subpopulations are assessed separately: Inner Mediterranean and Strait of Gibraltar subpopulation.

This inner Mediterranean subpopulation is isolated from the North Atlantic and the Strait of Gibraltar. Recent estimates suggest that it consists of no more than around 2500 mature individuals. A decline of 35% in the last three generations was inferred based on significant declines in survival rates due to a morbillivirus epizootic outbreak observed in the most abundant areas. In addition, Pilot whales face several anthropogenic threats such as high contaminant levels, potential disturbance (due to noise, harassment or collisions) from maritime traffic and injuries from fisheries interactions. It is therefore currently assessed as Endangered under the Criteria C2a(ii).

Depth range and ecology

Pilot whales are highly social animals, with a stable social structure formed by small matrilineal units. They are a predominantly offshore species with a preference for deep waters, from 500 to 2500 m. They are predominantly squid-eaters, but they also feed at least occasionally on pelagic fish.

Pilot whales are found almost exclusively in the western Mediterranean Sea, from east of the Djibouti Bank and the Alborán Dorsal up to the Ligurian Sea. Density of this species is highest in the westernmost areas of the basin such as the Alborán Sea and the Gulf of Vera, where they are present throughout the year. Large aggregations have also been observed there, possibly for breeding purpose. Density is low in other regions of the western Mediterranean and they are extremely rare in the central basin.

Main threats

Owing to their pelagic distribution, Pilot whales are probably not often exposed to human activities that occur in coastal waters (tourism, many types of fisheries, etc.) except in areas where the continental platforms is short such as the Gulf of Vera and the Ligurian Sea.

The main threat identified was an epizootic of morbillivirus, with the main outbreak observed in 2006-2007 in the Alborán Sea and Gulf of Vera and possible later resurgences.

Pilot whales are occasionally caught by Spanish long-liners and probably by illegal driftnets. Collisions with ships, disturbance from whale-watching activities and from vessel noise have been recorded.

Pilot whales show high concentrations of organic contaminants (DDTs and PCBs), flame retardants and heavy metals. Some of these compounds are above thresholds considered harmful to marine mammal immune and reproductive systems and could have played a role in the high mortality observed during the morbillivirus.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

No management or conservation measures have been taken as yet specifically for the conservation of Pilot whales in the Mediterranean Sea.

Two Spanish Natura 2000 sites include important Pilot whale habitat, these are the SCIs ESZZ16003 Sur de Almería – Seco de los Olivos, ES6200048 Valles submarinos del escarpe de Mazarrón. However, none of these MPAs has implemented specific conservation actions benefitting Pilot Whales.

They are also found, albeit in low densities, at the two large Specially Protected Area of Mediterranean Importance (SPAMI), the Pelagos Sanctuary and the “Corredor de Migración de Cetáceos del Mediterráneo” (Figure 6). One Important Marine Mammal Areas (IMMA) has been identified for their recognised importance to the species (Figure 11).

In 2011, the Mediterranean Long-finned pilot whale population was declared “Vulnerable” in the Spanish National Catalogue of Endangered Species, which requires the implementation of a conservation plan. A draft conservation plan for Spanish Mediterranean Pilot whales was submitted in 2011 and revised in 2015, including 25 conservation measures. Most of them were scored as high priority and aimed at reducing potential impact of maritime traffic, contaminants and bycatch in fisheries with the identification of areas where these threats are cumulative. However, this conservation plan has not yet been endorsed by the Spanish authorities.

Source: Gauffier, P. & Verborgh, P. 2021. *Globicephala melas* (Inner Mediterranean subpopulation). *The IUCN Red List of Threatened Species* 2021: [e.T198787290A198788152](https://www.iucnredlist.org/species/9250/3150309).

LONG-FINNED PILOT WHALE

ES: Calderón común | FR: Globicéphale noir | AR: حوت طيار طويل الزعانف

Globicephala melas
Artiodactyla / Delphinidae



A long-finned pilot whale from the Strait of Gibraltar © Tethys Research Institute

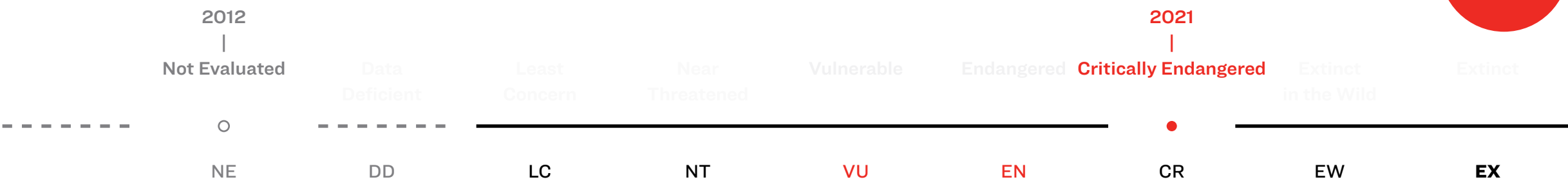


The long-finned pilot whale subpopulation from the Strait of Gibraltar is classified as Critically Endangered. © Tethys Research Institute



Maritime traffic, including unregulated whale watching, can cumulatively impact pilot whales. © Tethys Research Institute

Strait of Gibraltar subpopulation



IUCN RED LIST

Year 2012
Category Not Evaluated

Year 2021
Category Critically Endangered
Criteria C2a(ii) ↓

The Long-finned pilot whale Mediterranean subpopulation was first assessed in 2010 as Data Deficient as a result of the absence of data on the species' biology, distribution and abundance across much of the Mediterranean region. The subpopulation is now divided in two and the Strait of Gibraltar subpopulation is here updated to Critically Endangered under the Criteria C2a(ii).

In the Strait of Gibraltar, there are fewer than 250 mature individuals of Long-finned pilot Whales. A population decline has been observed in recent decades, however the causes and processes behind it are not fully understood.

In addition to the morbillivirus epizootics, Pilot whales face several anthropogenic threats such as high contaminant levels, potential disturbance (due to noise, harassment or collisions) from maritime traffic and whale-watching and injuries from fisheries interactions.

Depth range and ecology

The Long-finned pilot whale is found in the central part of the Strait of Gibraltar between depths of 300 m to 800 m and associated with the West Alborán Gyre in waters generally deeper than 1000 m. Pilot whales are highly social animals, with a stable social structure formed by small matrilineal units, similar to the ones found in Killer whales (*Orcinus orca*).

Pilot whales in the Strait feed on squids and fish based on stomach contents containing cephalopod beaks and fish otoliths and bones. They also feed at lower trophic levels than do Common Bottlenose dolphins (*Tursiops truncatus*), Sperm whales (*Physeter macrocephalus*) and Killer whales from the same area, but at higher levels than Short-beaked Common dolphins (*Delphinus delphis*). There appears to be some level of habitat segregation (perhaps dictated by specialisation in different prey species) among Pilot whales groups within the Strait of Gibraltar. In this area, Pilot whales occur in waters 600–800 m deep, which means they can easily exploit the seafloor and feed at any time during the day or night.

Main threats

The main threat identified was an epizootic of morbillivirus, with the main outbreak observed in 2006–2007 and possible later resurgences.

Pilot whales are occasionally caught by Spanish long-liners and probably by illegal driftnets. Collisions with ships, disturbance from whale-watching activities and from vessel noise have been recorded.

Pilot whales show high concentrations of organic contaminants (DDTs and PCBs), flame retardants and heavy metals, even higher than in the inner Mediterranean subpopulation. Some of these compounds are above thresholds considered harmful to marine mammal immune and reproductive systems and could have played a role low survival rates estimated for younger individuals in the population and high adult mortality observed during the morbillivirus.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

No management or conservation measures have been taken as yet specifically for the conservation of this species.

In 2017, 26 areas within the Mediterranean region received the status of Important Marine Mammal Areas (IMMAs), defined as “discrete portions of habitat, important to marine mammal species (of which 19 areas for cetacean species), that have the potential to be delineated and managed for conservation”. Besides the Alborán Deep [IMMA](#), identified for their recognised importance to the species, three other IMMAs have been designated important to Pilot Whales: the Strait of Gibraltar and Gulf of Cádiz, the Alborán Corridor and Alborán Sea.

One Spanish Natura 2000 site includes important Pilot whale habitat, the SCI ES6120032 Estrecho Oriental.

In 2011, the Mediterranean Long-finned pilot whale population, including the Strait of Gibraltar subpopulation, was declared “Vulnerable” in the Spanish National Catalogue of Endangered Species, which requires the implementation of a conservation plan. A draft conservation plan for Spanish Mediterranean Pilot whales was proposed in 2011 and revised in 2015, including 25 conservation measures, including actions on research, management, legislation, education and monitoring. Most of them were scored as high priority and aimed at reducing potential impact of maritime traffic (including whale watching activities), contaminants and potential bycatch in fisheries with the identification of areas where these threats are cumulative. However, this conservation plan has not yet been adopted by the Spanish authorities.

Source Verborgh, P. & Gauffier, P. 2021. *Globicephala melas* (Strait of Gibraltar subpopulation). The IUCN Red List of Threatened Species 2021: [e.T198787290A198788152](#).

RISSEO’S DOLPHIN

ES: Delfín de Risso | FR: Dauphin de Risso | AR: دولفين ريسو

Grampus griseus
Artiodactyla / Delphinidae



Illustration by Massimo Demma

Mediterranean subpopulation



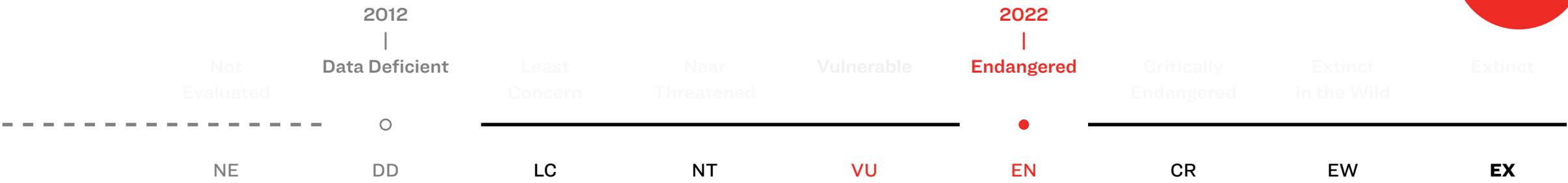
FIGURE 12. The distribution of the Risso's dolphin (*Grampus griseus*) Mediterranean subpopulation, showing the IMMAs designated for this species. Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

- Extant (resident)
- Presence Uncertain

Important Marine Mammal Areas (IMMA)

- North West Mediterranean Sea, Slope and Canyon System IMMA
- Alboran Deep IMMA

Mediterranean subpopulation



IUCN RED LIST

Year **2012**
Category **Data Deficient**

Risso's Dolphin, found in global temperate and tropical waters, lacks comprehensive knowledge. Abundance estimates are sparse, as are distribution details. The Mediterranean subpopulation also suffers from data gaps. No large-scale surveys exist, and though small-scale surveys identify specific areas, overall assessment is Data Deficient. In the Ligurian-Corso-Provençal basin, long-term studies reveal genetic differentiation, intra-basin structuring, and site fidelity among some summer individuals. Preferred habitat is continental slope waters with steep relief. Risso's Dolphins are caught incidentally. To assess the subpopulation, essential data include distribution, abundance, habitat relationship, population structure, and genetic diversity.

Source: Gaspari, S. & Natoli, A. 2012. *Grampus griseus* (Mediterranean subpopulation). *The IUCN Red List of Threatened Species* 2012
<https://www.iucnredlist.org/species/16378423/16378453>

Year **2022**
Category **Endangered**
Criteria **A2bc**



A small part of the population, located in the Ligurian-Corso-Provençal basin (north-western Mediterranean) has been monitored in past decades. From this small subpopulation a decline of 80% in the last three generations has been inferred. This would be enough to list the species as Critically Endangered, but, due to the size of the sample, the whole subpopulation may be considered simply Endangered. Similarly, a 50% reduction of the Area of Occupancy (AOO) has also been inferred at the Mediterranean level. Risso's Dolphins are threatened by entanglement in fishing gears, pollutants (contaminants burdens and noise) and climate change related effects. These threats, which are likely to explain the current decreasing population trend of the taxon, are not understood and have probably not ceased.

Depth range and ecology

Risso's dolphin shows a preference for deep pelagic waters, in particular over steep shelf slopes and submarine canyons, at water depths of approximately 300-1500 m. Habitat suitability models in the north-western Mediterranean confirmed a strong preference with steep slope habitat and a narrow band of suitable habitat in proximity to the 200 m contour.

Sightings were also reported far offshore and in deeper pelagic waters suggesting that the species also use offshore areas far from the continental slope. Changes in the distribution and habitat were reported at local scale in the north-western Mediterranean Sea, which highlighted a lower encounter rate over the coastal and continental slope in recent years and a more stable presence in the pelagic area.

The habitat preference suggests a feeding specialisation, with the species primarily feeding on deep-water cephalopods. Stomach contents showed a strong preponderance of cephalopods mostly Argonautidae, Ommastrephidae, Histioteuthidae and Onychoteuthidae.

Main threats

The major threat to Risso's dolphin in the Mediterranean Sea is entanglement in fishing gear. Bycatch in longlines and gill-nets have been reported. Stranded animals showed evidence of bycatch in fishing gear in the western and eastern basins and in the Adriatic Sea.

In addition, Risso's dolphin in the Mediterranean Sea carry substantial contaminant burdens. Other potential threats include noise pollution and the ingestion of marine litter.

Disturbance by vessels can represent a problem for the species. Invasive approaches of boats can interrupt important behaviour including feeding and reproduction, and could potentially stress and even ultimately kill weak or young animals. The potential effect due to climate change can be inferred by the estimated changes in abundance and distribution.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

A National Conservation Plan was proposed in 2011 for Risso's dolphin in Spanish waters. Furthermore, two large Specially Protected Area of Mediterranean Importance (SPAMI) encompass some of the species natural range: the Pelagos Sanctuary for Mediterranean Marine Mammals and the “Corredor de Migración de Cetáceos del Mediterráneo”.

Among Mediterranean Important Marine Mammal Areas (IMMAs), two areas have been designated for their recognised importance to Risso's Dolphin: the Alborán Deep located in the south-western Mediterranean and the northwest Mediterranean Sea, Slope and Canyon System (Figure 12). In addition, the presence of Risso's dolphin is reported in other areas ranging from the western to eastern Mediterranean basins.

Existing best practices against bycatch/entanglements in fishing gears could benefit Risso's dolphin if they were implemented and supported. Considering noise pollution, marine litter and disturbance, implementing and supporting existing Directives (2008/56/EC; MSFD), best practices or guidelines (as the ACCOBAMS/PELAGOS code of conduct) will benefit Risso's dolphin conservation status.

Source: Lanfredi, C., Arcangeli, A., David, L., Holcer, D., Rosso, M. & Natoli, A. 2022. *Grampus griseus* (Mediterranean subpopulation) (errata version published in 2022). *The IUCN Red List of Threatened Species* 2022: e.T16378423A210404051.
[Grampus griseus Mediterranean subpopulation \(Risso's Dolphin\) \(iucnredlist.org\)](https://www.iucnredlist.org/species/16378423/16378453)

SPERM WHALE

ES: Cachalote | FR: Cachalot | AR: حوت العنبر

Physeter macrocephalus

Artiodactyla / Phryseteridae



Illustration by Massimo Demma

Mediterranean subpopulation



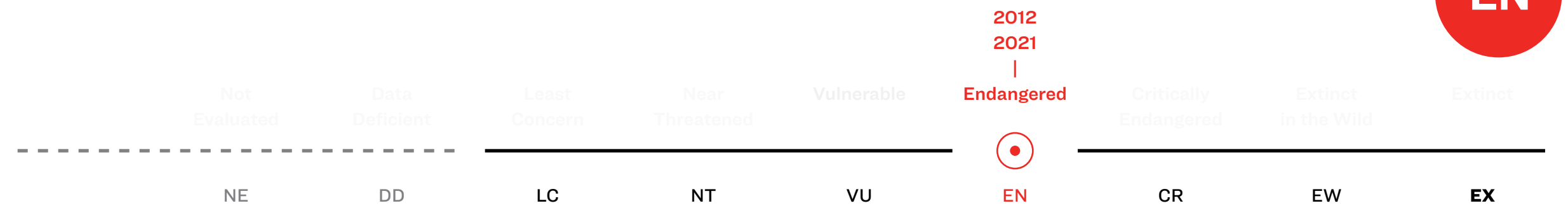
FIGURE 13. The distribution of the Sperm whale (*Physeter macrocephalus*) Mediterranean subpopulation, showing the IMMAs designated for this species. Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

- Extant (resident)
 Extant (seasonality uncertain)
 Presence Uncertain

Important Marine Mammal Areas (IMMA)

 - 1) Alboran Corridor IMMA
 - 2) Alboran Deep IMMA
 - 3) North West Mediterranean Sea, Slope and Canyon System IMMA
 - 4) Balearic Islands Shelf and Slope IMMA
 - 5) Campanian and Pontino Archipelago IMMA
 - 6) Hellenic Trench IMMA

Mediterranean subpopulation



IUCN RED LIST

Year	2012
Category	Endangered
Criteria	C2a(ii)

In 2006, there were fewer than 2500 mature individuals, all belonging to the same subpopulation. The subpopulation was inferred to experience a decline in number of mature individuals since a number of threats, including bycatches in fishing gear and ship strikes. In addition, the subpopulation could be affected by disturbance, particularly related to intense maritime traffic. It is suspected that a combination of these factors has led to a decline 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.

Source: Notarbartolo di Sciarra, G., Frantzis, A., Bearzi, G. & Reeves, R. 2012. *Physeter macrocephalus* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012
<https://www.iucnredlist.org/species/16370739/16370477>

Year	2021
Category	Endangered
Criteria	C2a(ii)

Available data sources suggest that there are still fewer than 2500 mature individuals in the Mediterranean subpopulation. Recent genetic analyses have not provided evidence for within-region population structure, suggesting that all individuals are concentrated in an undivided subpopulation. The decline in number of mature individuals is inferred to be continuing.

Sperm whale diet in the Mediterranean appears to focus on mesopelagic squids of the genera *Histioteuthis* and *Octopoteuthis*. Both solitary males and social groups feed throughout their range but might segregate at fine scales.

This population is mobile over large scales, but movements appear largely irregular rather than migratory. In the western basin, males use more northern waters in the summer months, while social units tend to remain south of 41°N; however, exceptions to this pattern are frequently observed. In the eastern basin, males and social units may co-occur year-round. Inter-basin movements have been observed, but their frequency is unknown.

Main threats

Until recently, entanglement in pelagic drift-nets had been the principal threat to this population. Entanglements have decreased in recent years, but this source of mortality is ongoing.

Intense maritime traffic can lead to collisions between Sperm whales and large vessels. Evidence of vessel strikes is increasing, suggesting that this threat applies across most of the population's range.

Maritime traffic can also cause disturbance, particularly commercial whale watching operations that deliberately approach Sperm Whales. Moreover, the underwater noise generated by seismic surveys, naval sonar, and dynamite fishing can elicit behavioural and physiological responses.

Marine litter (largely plastic) is often found in the digestive tract of stranded Sperm Whales, sometimes with fatal consequences. Pollution from agricultural or industrial discharges is also a source of concern, including persistent organic pollutants, trace element metals (e.g., mercury and aluminium), and arsenic.

Evidence of infection from cetacean morbillivirus has been found in Sperm Whales, even though the potential for related epizootics in the species is unknown.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

The Pelagos Sanctuary, identified as Specially Protected Areas of Mediterranean Importance (SPAMI) in 2001, encompasses key Sperm whale habitat in portions of the Provençal, Corsican, Ligurian, Tyrrhenian and northern Sardinian Seas. Also the SPAMI “Corredor de Migración de Cetáceos del Mediterráneo”, between the Balearic islands and the Iberian mainland, covers a large portion of habitat for the Sperm whale (Figure 6).

The “Notice to Mariners to protect cetaceans from the risk of ship collisions in the Strait of Gibraltar”, published in January 2007 by the Spanish Ministry of Defence, established a security area characterised by high densities of Sperm Whales, where crossing ships are urged to limit their speed to 13 knots from April to August and to navigate with caution. However, there is no evidence of compliance and this measure is seasonal. In 2019, the Cabrera Archipelago Maritime-Terrestrial National Park in the Balearic Islands was extended (now covering a total of 908 km²) to protect important offshore habitat for Sperm Whales.

Among Mediterranean IMMAs, six (and one candidate: East Sicily and Strait of Messina cIMMA) areas have been designated for their recognised importance to Sperm whales (Figure 13). However, management of human activities in the offshore habitat used by the species remains problematic. For example, in the Hellenic Trench in the Aegean Sea and around the Balearic archipelago, major shipping routes run on or close to the 1,000 m depth contour.

Source: Pirotta, E., Carpinelli, E., Frantzis, A., Gauffier, P., Lanfredi, C., Pace, D.S. & Rendell, L.E. 2021. *Physeter macrocephalus* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: [e116370739A50285671](https://doi.org/10.2305/IUCN.DK.2021-2.e116370739A50285671).

STRIPED DOLPHIN

ES: Delfín listado | FR: Dauphin rayé | AR: دولفين مخطط

Stenella coeruleoalba
Artiodactyla / Delphinidae

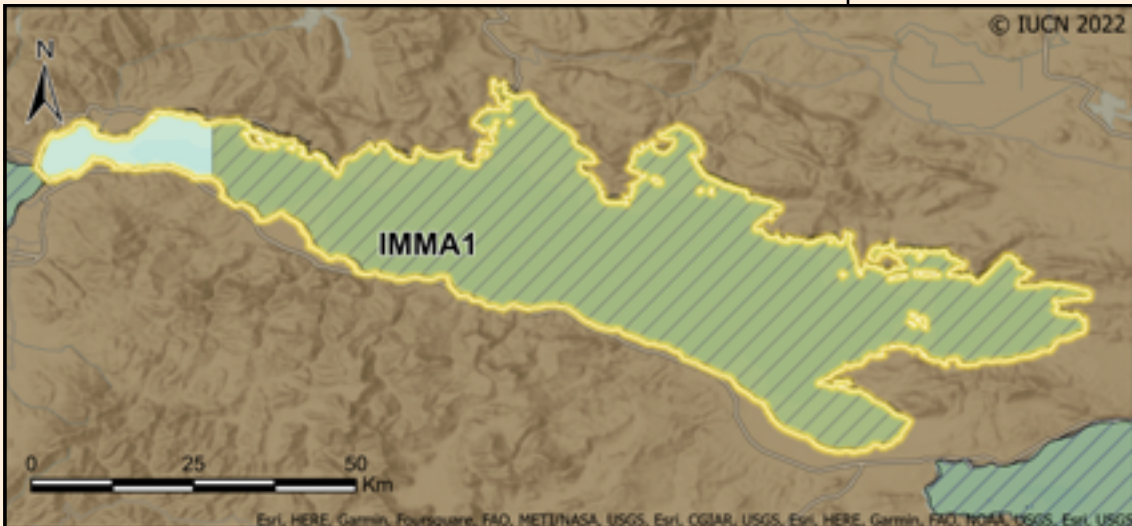


Illustration by Massimo Demma

Mediterranean subpopulation



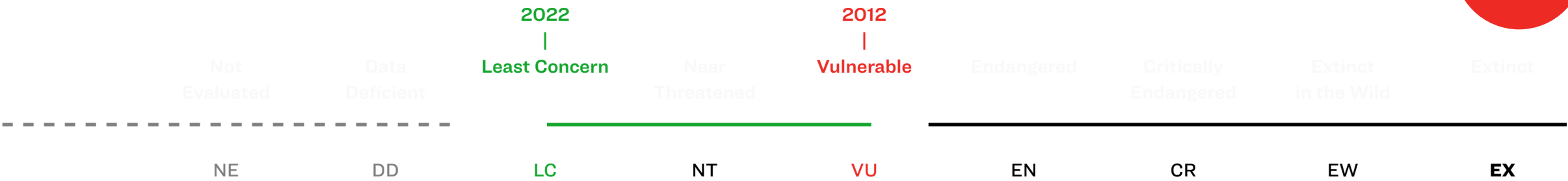
Gulf of Corinth subpopulation



- Extant (resident)
- Extant & Vagrant (seasonality uncertain)
- Possibly Extant & Vagrant (seasonality uncertain)
- Presence Uncertain & Origin Uncertain
- Important Marine Mammal Areas (IMMA)**
 - 1) Gulf of Corinth IMMA

FIGURE 14. The distribution of the Striped dolphin (*Stenella coeruleoalba*) Mediterranean and Gulf of Corinth subpopulation, showing the IMMA designated for this species.
Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

Mediterranean subpopulation



IUCN RED LIST

Year **2012**
Category **Vulnerable**
Criteria **A2bcde**

In 2006, there were fewer than 2500 mature individuals, all belonging to the same subpopulation. The subpopulation was inferred to experience a decline in number of mature individuals since a number of threats, including bycatches in fishing gear and ship strikes. In addition, the subpopulation could be affected by disturbance, particularly related to intense maritime traffic. It is suspected that a combination of these factors has led to a decline 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.

Source: Aguilar, A. & Gaspari, S. (2012). *Stenella coeruleoalba* (Mediterranean subpopulation). *The IUCN Red List of Threatened Species* 2012
<https://www.iucnredlist.org/species/16674437/16674052>

Year **2022**
Category **Least Concern**

Recent information, primarily obtained through the ACCOBAMS Survey Initiative (ASI) has shown the *Stenella coeruleoalba* Mediterranean subpopulation to both be much larger (in terms of mature individuals, probably approaching 600 000 mature individuals and increasing) and to be less impacted by threats than suspected in the previous (2010) assessment of this subpopulation. Therefore, the assessment of the species is revised from Vulnerable to Least Concern. This is considered a non-genuine change, as it is based on new and improved knowledge that suggests that the population decline considered in 2010 was not as significant as thought (Gómez de Segura et al. 2006; Forcada et al. 1994).

Depth range and ecology

The Striped dolphin is the most abundant cetacean species in the Mediterranean Sea; individuals are present most commonly in highly productive waters beyond the continental shelf (700 m).

Striped dolphins feed on an extensive range of species from epipelagic to bathypelagic preys like lanternfish, cod, and squid; differences in diet composition are recognised between the western and eastern Mediterranean Basin where the species is less abundant.

Main threats

The Striped dolphin is a reservoir of cetacean morbillivirus (CeMV). Several epizootic outbreaks occurred since the '90 causing an unprecedented mortality in individuals from the western Mediterranean basin. To date, epidemiological data are suggesting an endemic circulation of the virus, which mostly affect the young individuals due to their lack of antiviral immune response.

Pollution from DDTs and PCBs besides organochlorine pollutants (OCs) is extremely concerning and toxicological cumulative stress is evident in recent mortality events. The alarming widespread of marine litter and debris may hamper the toxicological stress of the species.

Incidental catch in fishing gear is still a source of mortality even if bycatch level are lower than in the '90. Climate change may pose an additional indirect threat, potentially affecting food availability in key feeding areas for the species.

All these elements may play a cumulative effect on this subpopulation and population monitoring is required, but at present the population is increasing.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

The SPAMI Pelagos Sanctuary in the north western Mediterranean Sea has been established for the protection of the marine mammals and includes a large portion of Striped dolphin habitat. Here individuals are concentrating year-round (Figure 6).

A general protection is warranted to all cetacean in the Mediterranean Sea throughout national and international law. Research activities are in progress according to both the EU Habitat and the Marine Strategy Framework Directives. This would provide a dedicated effort focused on ecological parameters as well on the Main threats which would inform management measures.

Source: Lauriano, G. 2022. *Stenella coeruleoalba* (Mediterranean subpopulation) (errata version published in 2022). *The IUCN Red List of Threatened Species* 2022: e.T16674437A210833690.
[Stenella coeruleoalba](https://www.iucnredlist.org/species/16674437/16674052) Mediterranean subpopulation (Striped Dolphin). (iucnredlist.org)

STRIPED DOLPHIN

ES: Delfín listado | FR: Dauphin rayé | AR: دولفين مخطط

Stenella coeruleoalba
Artiodactyla / Delphinidae



A pod of Striped Dolphins in the Gulf of Corinth. © Giovanni Bearzi, Dolphin Biology and Conservation



A Striped dolphin in the Gulf of Corinth © Silvia Bonizzoni, Dolphin Biology and Conservation

Gulf of Corinth subpopulation



IUCN RED LIST

Year 2012
Category Not Evaluated

Year 2022
Category Endangered
Criteria B1ab(iii)



Striped dolphins in the Gulf of Corinth are geographically and genetically isolated and it cannot be assumed that Striped dolphins in the adjacent Ionian Sea (or in the entire Mediterranean Sea) may represent a "source" population capable of having a "rescue effect" on the Gulf of Corinth subpopulation.

The subpopulation qualifies as Endangered under criterion B1ab(iii), as it occurs in one location (B1a) and a continuing decline in the quality of habitat can be inferred. The subpopulation qualifies as Endangered under criterion B1ab(v), based on projection models showing that the production of hybrid offspring with sympatric Common dolphins (*Delphinus delphis*) can negatively affect the population status of Striped Dolphins.

Depth range and ecology

Striped dolphins in the Gulf of Corinth occur predominantly in deep waters in the central and southern sectors of the Gulf. Preference for waters deeper than 300 m is consistent with the findings from other Mediterranean areas and with a diet based on pelagic and bathypelagic prey species living in the water column (including bony fishes of the families Gadidae, Sparidae and Gonostomiatidae and, perhaps more importantly, cephalopods of the families Histiotheuthidae, Ommastrephidae, Enoploteuthidae and Onychoteuthidae). While studies of Striped dolphin diet were not conducted in the Gulf of Corinth, repeated findings of fresh and wounded dead specimens of the long-armed squid (*Chiroteuthys veranyi*) occurred while tracking Striped dolphin groups, suggesting

that these squids could have been killed by them. This is consistent with stomach contents analyses of Striped dolphins from Turkey, suggesting that cephalopods with wide vertical distribution and diurnal movements are important prey. Striped dolphins in the Gulf of Corinth were never observed schooling and chasing epipelagic fish at the surface.

Main threats

A scarcity of information and lack of baseline data prevent understanding of the past and present effects of human impact in the Gulf of Corinth.

Colossal amounts of hazardous industrial waste have been dumped into the Gulf for over half a century. Preferred Striped dolphin habitat overlaps with areas of massive disposal of residue from extraction of aluminium ("red mud"), including iron oxides, aluminium and titanium. Indirect effects such as contamination up the food web are possible, considering the immunotoxin and other detrimental effects of environmental pollutants. In the past, rapidly spreading epizootics, potentially triggered by pollutants and decreased food availability, have decimated Mediterranean Striped Dolphins.

Other extant threats to Gulf of Corinth Striped dolphins include the negative effects of overfishing, as well as anthropogenic noise caused by geophysical research and seismic surveys.

In the Gulf of Corinth, Striped dolphin admixture with Common dolphins is a source of concern, as hybridisation and introgression increase the probability of extinction through genetic and demographic swamping.

Current conservation measures

For a comprehensive list of the international agreements that protect this taxon, see Table 4.

In the waters of Greece, including the Gulf of Corinth, a variety of binding national, regional and international legislative instruments require the protection of all cetacean species. In 2007, the Agreement on the

Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS), ratified by Greece, listed the Gulf of Corinth as an area of special importance, calling for the creation of a Marine Protected Area. The Gulf of Corinth is one of 26 areas characterised as IMMA in the Mediterranean region (Figure 14). Its inclusion was based on the occurrence of isolated populations of Striped dolphins and Common Dolphins. The management actions necessary to protect cetaceans in Greece were outlined in the National Strategy and Action Plan for the conservation of cetaceans in Greece, 2010–2015, which identified the Gulf of Corinth as an area of special conservation importance. In February 2018 the entire Gulf of Corinth was included in the EU Natura 2000 network.

The repeatedly-advocated creation of a Marine Protected Area in the Gulf of Corinth could contribute to ensuring a long-term favourable status to Striped Dolphins, as long as protection includes a strictly enforced ban of fishing gear known to deplete marine food webs and cause ecosystem damage, such as purse seining, beach seining and trawling. Conversely, extant subsistence artisanal (small-scale) fishing does not seem to represent a threat to Striped Dolphins. High-intensity underwater noise (e.g. caused by seismic surveys) should be banned.

Source: Bearzi, G., Bonizzoni, S. & Santostasi, N.L. 2022. *Stenella coeruleoalba* (Gulf of Corinth subpopulation). The IUCN Red List of Threatened Species 2022: e.T210188066A210188619.

ROUGH-TOOTHED DOLPHIN

ES: Delfín de dientes rugosos | FR: Dauphin à bec étroit | AR: حولفين خشن للأسنان

Steno bredanensis
Artiodactyla / Delphinidae

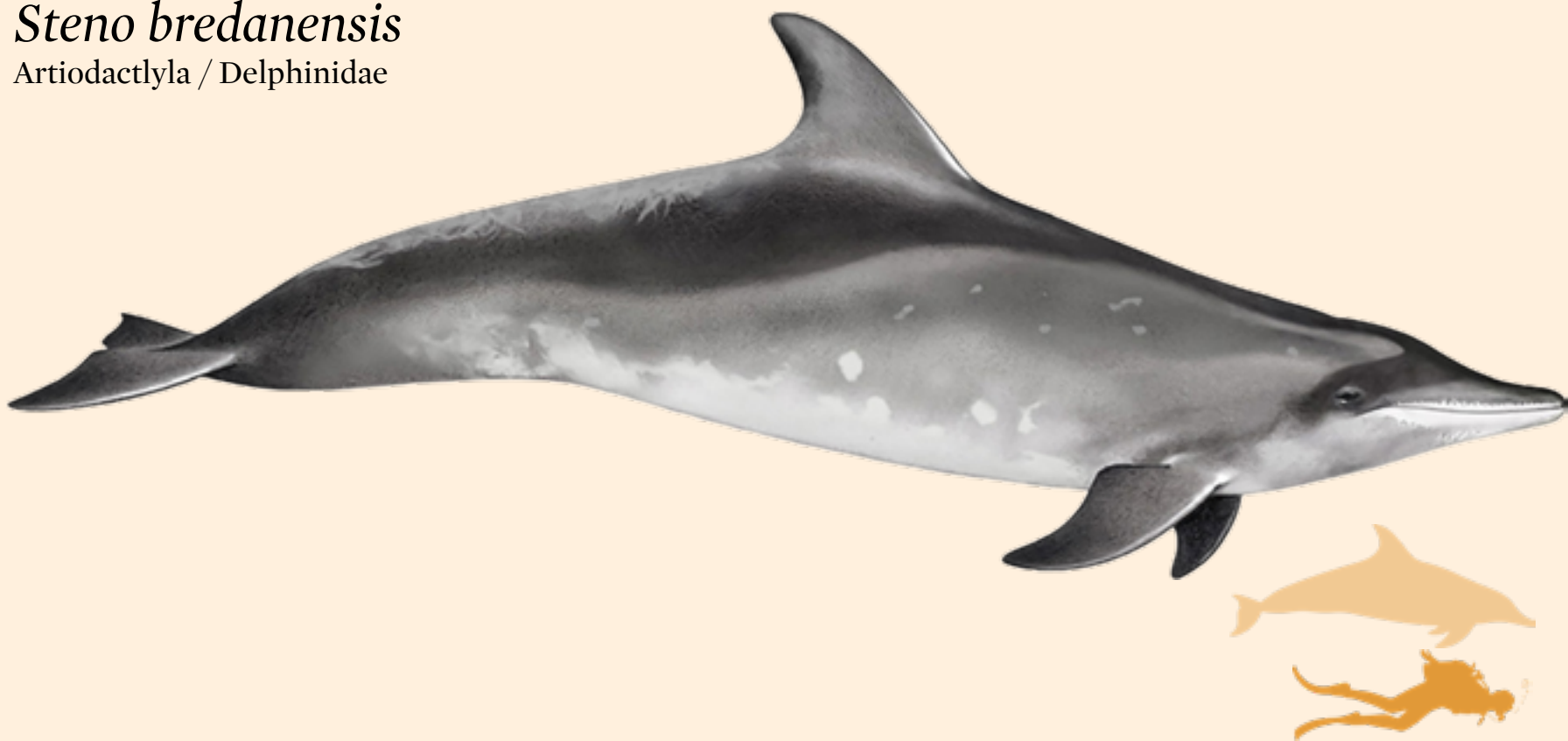


Illustration by Massimo Demma

Mediterranean subpopulation



FIGURE 15. The distribution of the Rough-toothed dolphin (*Steno bredanensis*) Mediterranean subpopulation. There are no IMMAs designated for this species in the Mediterranean Sea
Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

- Extant (seasonality uncertain)
- Possibly Extant (seasonality uncertain)
- Important Marine Mammal Areas (IMMA)

Mediterranean subpopulation



IUCN RED LIST

Year **2012**
Category **Not Evaluated**

Year **2021**
Category **Near Threatened**
Criteria **D1** ?

A provisional molecular study found Mediterranean individuals to be clustered genetically within the Atlantic population, but to form a distinct sub-cluster within it, suggesting the Atlantic origin of the Mediterranean subpopulation of the Rough-toothed dolphin Mediterranean subpopulation with subsequent isolation. A more extensive genetic study is needed to rule out exchange through Lessepsian migration with Indian Ocean populations.

The taxon cannot be assessed against criteria A and C, since there are no data from which to infer trends, and there is insufficient data to perform a quantitative analysis, as required for assessment against criterion E. Based on the most likely inferred number of mature individuals of 1200, based on recent ACCOMBAMS survey data, justifying a Near Threatened assessment of this Mediterranean Sea subpopulation.

More research is needed on the subpopulation's distribution, abundance and trends, life history, ecology, genetics and threats, on which to base a categorical risk assignment.

Depth range and ecology

The typical habitat in the eastern Mediterranean is mid-ocean pelagic. The mean water depth at sighting locations was 1880 m (range: 320-3137) with a mean distance from shore of 66 km. Even when residing in deep water, Rough-toothed dolphins are considered to be surface feeders, preying on both fish and cephalopods, yet, dietary habits in the Mediterranean are virtually unknown. The species prefers warm waters (>22 degrees °C), which during winter are restricted to the south-eastern corner of the Levant Basin, a region into which the population may retreat during the winter months.

Main threats

There is little information available on threats for this species in the Mediterranean. From 1997 to 2013, there were four reports of gill-net bycatch and two live mass strandings. Gas prospecting and naval exercises deploying active low-frequency SONAR are potential causes for the latter. Bycatch, as known so far, only applies to individuals venturing into shallow water. In the last decade, only a single stranding event has been documented, that of an individual in the Saronikos Gulf, Aegean Sea, on July 23, 2021.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

Currently, there are no conservation measure specifically directed at this species in the Mediterranean. Marine Protected Areas in pelagic waters within its suspected Area of Occurrence are lacking (Figure 15).

Source: Kerem, D., Frantzis, A., Scheinin, A. & Goffman, O. 2021. *Steno bredanensis* (Mediterranean subpopulation). *The IUCN Red List of Threatened Species* 2021: [e.T160158217A160158353](#).



Photo © Silvia Frey

COMMON BOTTLENOSE DOLPHIN

ES: Delfín mular | FR: Grand dauphin | AR: دولفين قارورة الأنف المشترك

Tursiops truncatus
Artiodactyla / Delphinidae

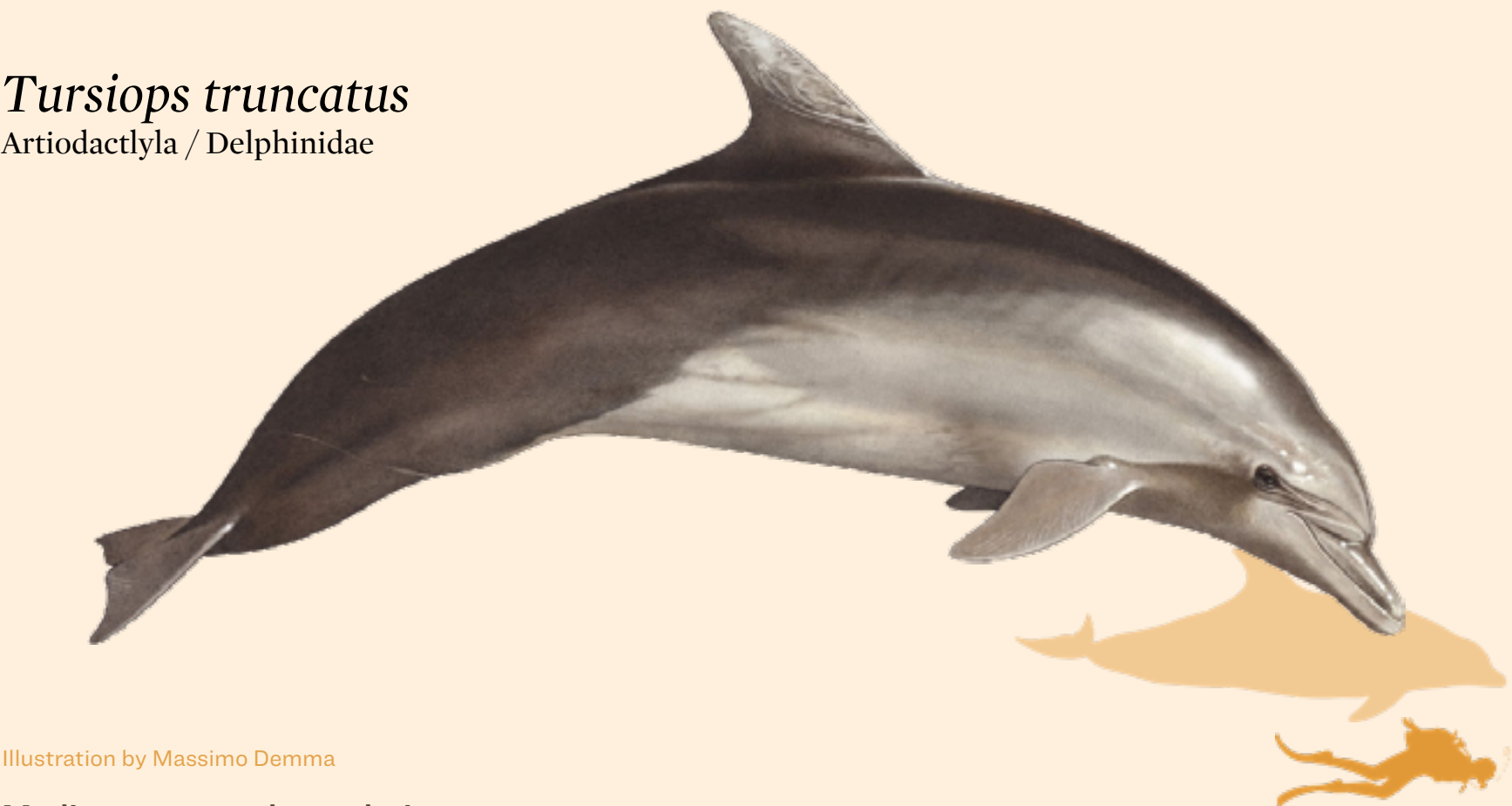
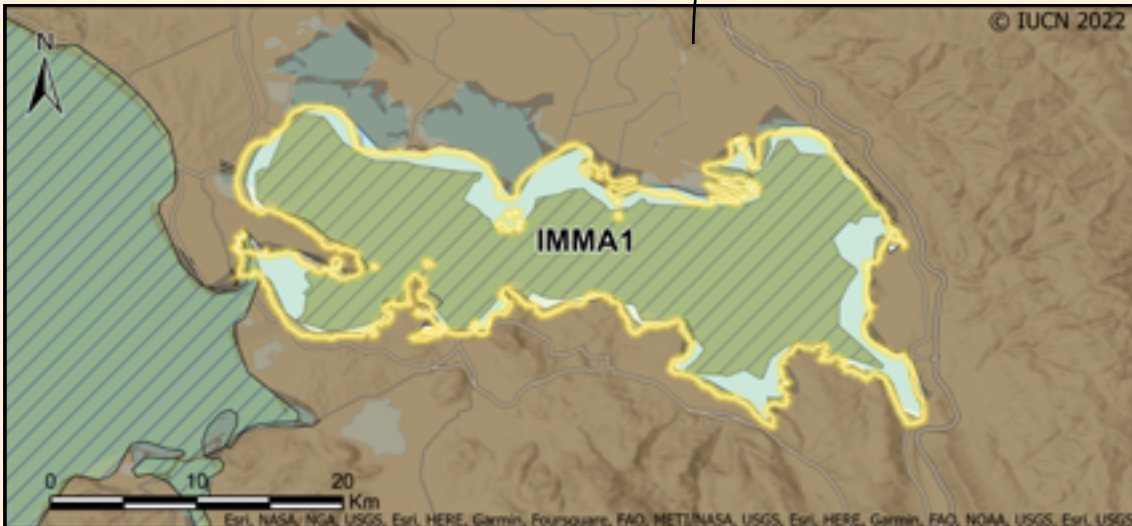


Illustration by Massimo Demma

Mediterranean subpopulation



Gulf of Ambracia subpopulation

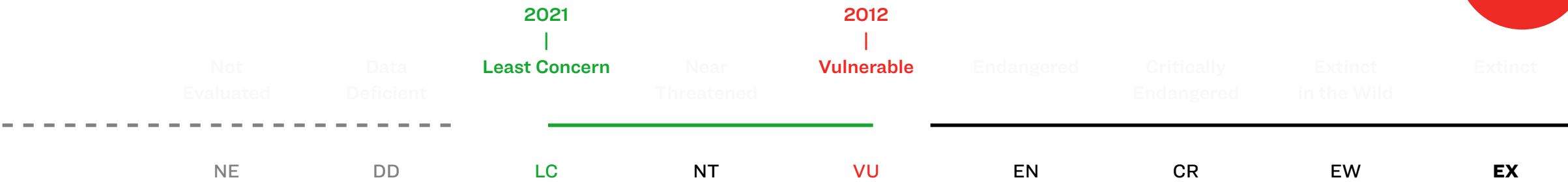


- Extant (resident)
- Important Marine Mammal Areas (IMMA)
- 1) Gulf of Ambracia IMMA
 - 2) Coastal Shelf Waters of the South East Levatine Sea IMMA
 - 3) Northern Adriatic IMMA
 - 4) Waters of Ischia and Ventotene IMMA
 - 5) Lampedusa IMMA
 - 6) Kelibia IMMA
 - 7) Shelf of the Gulf of Lion IMMA
 - 8) Alboran Sea IMMA

FIGURE 16. The distribution of the Common Bottlenose dolphin (*Tursiops truncatus*) Mediterranean and Gulf of Ambracia subpopulation, showing the IMMA designated for this species.

Esri, NASA, NGA, USGS, Esri

Mediterranean subpopulation



IUCN RED LIST

Year 2012
Category Vulnerable
Criteria A2cde

Historical intentional killing targeted common bottlenose dolphins along the Mediterranean's northern regions. Some previously abundant areas have experienced bottlenose dolphin declines, possibly extending to other northern basin zones, implying a population drop of over 30% since 1940. Thus, their Vulnerable classification is due to extensive past extermination campaigns in the northern western basin (halted in the 1960s), along with recent issues like bycatch, prey depletion, and habitat quality decline.

Source: Bearzi, G., Fortuna, C. & Reeves, R. 2012. *Tursiops truncatus* (Mediterranean subpopulation). *The IUCN Red List of Threatened Species* 2012. <https://www.iucnredlist.org/species/16369383/16369386>

Year 2021
Category Least Concern

Since the last assessment in 2009, new information has become available. The first basin-wide distance sampling abundance estimate (2018) suggests a population of about 60,000 animals (95%CI=45 000-79 000), likely to be higher considering some areas were not surveyed.

Despite ongoing anthropogenic threats, most of the available mark-recapture abundance estimates of local populations and stranding data over the past 2-3 decades suggest an overall stable population. Based on recent data, none of the IUCN criteria for threatened or near threatened designations were met and the Mediterranean Common Bottlenose dolphin subpopulation is therefore assessed as Least Concern. This represents a non-genuine change on the basis of new information since the first assessment of this Mediterranean subpopulation as Vulnerable.

Depth range and ecology

Mediterranean Common Bottlenose dolphins are widely distributed throughout the entire Mediterranean Sea. They occur primarily in waters with depth <100 m, but they can also be found in deeper waters. They regularly occur in inshore, coastal, offshore waters and around offshore islands, and in archipelagos.

Their diet is extremely varied, including demersal species such as European hake (*Merluccius merluccius*), European conger (*Conger conger*), Red mullet (*Mullus barbatus*), Striped red mullet (*Mullus surmuletus*), Common cuttlefish (*Sepia officinalis*), Common octopus (*Octopus vulgaris*) and Snake blenny (*Ophidion barbatum*), semi-pelagic species like the Bogue (*Boops boops*) and epipelagic clupeids, e.g. Round sardinella (*Sardinella aurita*).

They are mostly resident, with seasonal distribution changes due to prey availability and human factors like fisheries, fish aquaculture, seasonal recreational boat traffic and underwater noise.

Although considered as one subpopulation, within the Mediterranean Sea, this species shows significant genetic structure and distinct genetically and/or socially and/or culturally differentiated populations across its range, often composed of few hundreds of individuals.

Main threats

As the Mediterranean Common Bottlenose dolphin primarily inhabits coastal waters, it faces various pressures from human activities. Current anthropogenic pressures on this species include bycatch, maritime traffic, chemical and acoustic pollution and overfishing, with uncertain effects in its population. While culling, a significant historical mortality factor, has ceased, intentional killing persisted legally in some Mediterranean regions until the late 20th century, and several threats persist, with some potentially worsening.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

Considering the presence of population substructure and the overlap of key habitats with substantial anthropogenic pressures, it is imperative to keep monitor and mitigate cumulative anthropogenic impacts on local-level reproductive success and survival. Some local populations could be more susceptible to specific pressures, requiring separate assessments when LC status doesn't apply for to those particular sub-regions.

Existing conservation actions are the following: The Mediterranean Common Bottlenose dolphin is protected under a number of treaties, including ACCOBAMS, EU Habitat Directive (Annex II and IV), CITES Appendix II, CMS Appendix II and Barcelona Convention SPA/BD protocol Annex II. In addition, eight IMMA and one candidate IMMA (Central Southern Adriatic IMMA) for Common Bottlenose dolphins have been identified in the Mediterranean Sea (Figure 16).

In 2012, the GFCM approved a Recommendation GFCM/36/2012/2 on mitigation of incidental catches of cetaceans in the GFCM area and, in 2019, a Resolution GFCM/43/2019/2 on enhancing conservation of cetaceans in the GFCM area of competence.

The Barcelona Convention Decision 2013, IG.21/3, on Ecosystem Approach including adopting definition of the Good Environmental Status (GES) and targets, defines some conservation objectives and targets for cetaceans, which refer to IUCN Red List categories. However, this international legislation has resulted in few actions to reduce threats to Common Bottlenose dolphins in the Mediterranean region. Implementation could be strengthened with data on bycatch levels, population structure, and regular basin-wide (and sub-regional) monitoring.

Source: Natoli, A., Genov, T., Kerem, D., Gonzalvo, J., Lauriano, G., Holcer, D., Labach, H., Marsili, L., Mazzariol, S., Moura, A.E., Öztürk, A.A., Pardalou, A., Tonay, A.M., Verborgh, P. & Fortuna, C. 2021. *Tursiops truncatus* (Mediterranean subpopulation) (errata version published in 2022). *The IUCN Red List of Threatened Species* 2021: [e.T16369383A215248781](https://www.iucnredlist.org/species/16369383/215248781).

COMMON BOTTLENOSE DOLPHIN

ES: Delfín mular | FR: Grand dauphin | AR: دولفين قارورة الأنف المشترك

Tursiops truncatus
Artiodactyla / Delphinidae



The common bottlenose dolphin subpopulation from the Gulf of Ambracia is classified as Critically Endangered. ©Joan Gonzalvo, Thetys Research Institute.



Common bottlenose dolphin in the Gulf of Ambracia ©Joan Gonzalvo, Thetys Research Institute.

Gulf of Ambracia subpopulation



IUCN RED LIST

Year 2012
Category Not Evaluated

Year 2021
Category Critically Endangered
Criteria C2a(ii) ↓

The semi-enclosed Gulf of Ambracia (Greece) hosts a single cetacean species, the Common Bottlenose Dolphin. Based on genetic analyses, the Ambracian Bottlenose dolphin forms a distinct subpopulation isolated from neighbouring conspecifics, with low levels of genetic diversity. The most robust estimates of the total number of Common Bottlenose dolphins in the Gulf collected over a 10-year period never exceeded 174 individuals. The continued deterioration of the Gulf's water quality and the observation of dolphins in poor health status, in the absence of effective management interventions to address the causes of such deterioration, leads to the inference that a decline of this Common Bottlenose dolphin subpopulation will continue in the near future. The Gulf of Ambracia Bottlenose Dolphins, with <250 mature individuals all part of a single subpopulation, undergoing an inferred continuing decline caused by the deteriorating quality of the Gulf's waters, qualify for Critically Endangered under criterion C2a(ii).

Depth range and ecology

The Gulf of Ambracia is a shallow, semi-enclosed embayment 405 km² wide, whose only communication with the open Ionian Sea is through the narrow and shallow Preveza Channel. On average, the depth of the Gulf is approximately 30 m (maximum 60 m), and its bottom mostly consists of mud and sand. The observed extent of occurrence of the subpopulation includes about three quarters of the total area of the Gulf, i.e., approx. 300 km², excluding enclosed marshes and lagoons. Ambracian Bottlenose dolphins feed largely on pelagic species that aggregate in large schools near the surface and the shoreline. They frequently engage in surface feeding of small schooling epipelagic clupeid fishes, predominantly the European pilchard (*Sardina pilchardus*) and the round sardinella (*Sardinella aurita*), and are often observed also foraging in the proximity of fish farm cages.

Main threats

The main threat to the Bottlenose dolphin subpopulation in the Gulf of Ambracia is the increasingly degraded condition of the Gulf's water quality, which is affected by agriculture, livestock and discharges of domestic sewage from coastal towns and villages. The deeper layers of the water column have become seasonally hypoxic, with the eastern portion becoming seasonally anoxic. Moreover, intensive fish farming in the Gulf contributes significantly to nutrient load.

With respect to toxicological status, the organochlorine levels found in Ambracian Bottlenose dolphins were similar to those of their conspecifics in the neighbouring waters of the Ionian Sea as far as HCB and PCBs were concerned; however, DDTs levels were four times higher in the Gulf. About half of the local fishermen have declared to be aware of occasional dolphin incidental captures. The development of unregulated dolphin-watching activities in the Gulf and the resulting disturbance caused also pose a potential threat.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

Cetaceans are protected against capture or killing in Greece by a Presidential Decree, which was followed by the ratification of international conventions including the Bern Convention, the Barcelona Convention and its SPA/BD Protocol, CITES, the Convention on Biological Diversity, the Convention on Migratory Species, and ACCOBAMS. Most notably, the European Council Habitats Directive and the Marine Strategy Framework Directive were ratified by national law.

The Gulf of Ambracia is a Natura 2000 site and is also part of the network of Ramsar Sites. In 2006 it was confirmed as a Site of Community Importance (SCI) and in 2011 it was designated as a Special Area for Conservation according to law 3937/29-3-11 (OJ 60 A). In 2008, the Gulf of Ambracia was also designated as a 'National Park'. Nevertheless, despite being protected by national, European, and international legislation, the Gulf is undergoing severe changes that are rapidly degrading the entire ecosystem.

This recent assessment of the conservation status of the Gulf of Ambracia Bottlenose dolphin subpopulation is likely to support the Greek Ministry of Environment and Energy in the development, legal approval and implementation of habitat and species' Action Plans, and Natura 2000 site Management Plan, in combination with targeted communication, public awareness and training actions.

The Gulf of Ambracia was also identified in 2017 as an IUCN Important Marine Mammal Area (IMMA) for Bottlenose Dolphins, based on criteria A, B(i), C(i) and D(i) (Figure 16).

Source: Gonzalvo, J. & Notarbartolo di Sciarra, G. 2021. *Tursiops truncatus* (Gulf of Ambracia subpopulation). The IUCN Red List of Threatened Species 2021: e.T181208820A181210985.



CUVIER’S BEAKED WHALE

ES: Zifio de Cuvier | FR: Baleine de Cuvier | AR: الحوت المنقلبي

Ziphius cavirostris
Artiodactyla / Ziphiidae



Illustration by Massimo Demma

Mediterranean subpopulation



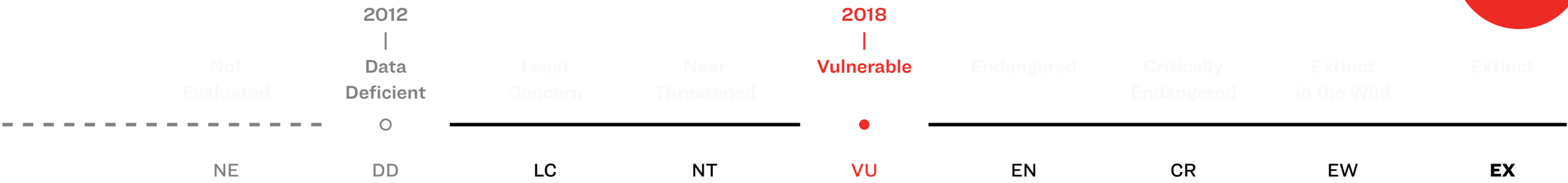
FIGURE 17. The distribution of the Cuvier's beaked whale (*Ziphius cavirostris*) Mediterranean subpopulation, showing the IMMAs designated for this species. Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.

Extant (resident)

Important Marine Mammal Areas (IMMA)

- 1) Alboran Corridor IMMA
- 2) Western Ligurian Sea and Genoa Canyon IMMA
- 3) Hellenic Trench IMMA

Mediterranean subpopulation



IUCN RED LIST

Year **2012**
Category **Data Deficient**

Appropriate data on distribution, population structure and abundance in the Mediterranean basin are lacking, except for a few limited areas. Additionally, the species' biology remains poorly known. The status of Cuvier's Beaked Whale in the Mediterranean is therefore unfeasible to assess with the currently available evidence.

Source: Cañadas, A. (2012b). *Ziphius cavirostris* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012
<https://www.iucnredlist.org/species/16381144/16382769>

Year **2018**
Category **Vulnerable**
Criteria **C2a(ii)**



This subpopulation is genetically distinct and contains fewer than 10 000 mature individuals, the subpopulation is inferred to be experiencing a continuing decline in numbers of mature individuals, and all mature individuals are considered to be in the same subpopulation. The species therefore qualifies as Vulnerable (C2a(ii)).

The taxon is threatened primarily by anthropogenic underwater noise from a range of sources, including military sonar use and seismic hydrocarbon exploration.

Depth range and ecology

Cuvier's beaked whale is an oceanic species often associated with steep slope habitat and a marked preference for submarine canyons and escarpments. They are less frequently observed in the pelagic waters of the Mediterranean.

Mean group size is fairly constant across the whole Mediterranean basin where data have been collected, ranging from 1.6 to 2.5 individuals. Social organisation 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.

Cuvier's beaked whale is mainly teuthophagic (squid eating). The most common prey species in the Mediterranean are from the family Histioteuthidae, 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, although that is not confirmed in the Mediterranean.

Main 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, which is certain forms of man-made underwater noise. This threat affects the species world-wide and it has been responsible for some of the observed deaths 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.

Current conservation measures

For a comprehensive list of all the international agreements that protect this taxon, see Table 4.

One hotspot for Cuvier's beaked whales in the Mediterranean, the Ligurian Sea, is included within the Pelagos Sanctuary created by Italy, France, and Monaco (Figure 6). However, no management or conservation measures have been taken as yet specifically for this species.

A 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, but it has not yet been designated or even evaluated by the Spanish administration. This proposed area includes another of the hotspots for Cuvier's Beaked Whales, the deep waters off southern Almería.

Three Important Marine Mammal Areas (IMMAs) in the Mediterranean have been identified, including important habitat for this species (Figure 17). Two candidate IMMA for the Cuvier's beaked whale and Fin whale have been proposed recently in the Mediterranean Sea: Central Tyrrhenian Sea cIMMA and North East Ionian Sea cIMMA. Although IMMAs are not legal designations, they are intended to attract managers' and decision makers' attention to areas that are especially important for marine mammals and that deserve special consideration.

As a result of the concerns regarding cetacean exposure to anthropogenic noise resulting from military activity, ACCOBAMS (2013) strongly recommended that, during naval exercises using sonar or underwater explosions, there should be absolute avoidance within an approximate 90 km buffer zone around all areas that have been designated as 'Areas of Special Concern for Beaked Whales' in the Mediterranean Sea.

Source: Cañadas, A. & Notarbartolo di Sciarra, G. (2018). *Ziphius cavirostris* (Mediterranean subpopulation) (errata version published in 2021). *The IUCN Red List of Threatened Species* 2018: [e.T16381144A199549199](https://www.iucnredlist.org/species/16381144/199549199).

KILLER WHALE

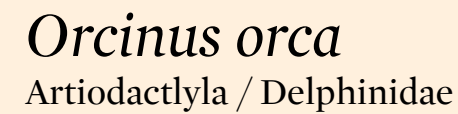


Illustration by Massimo Demma

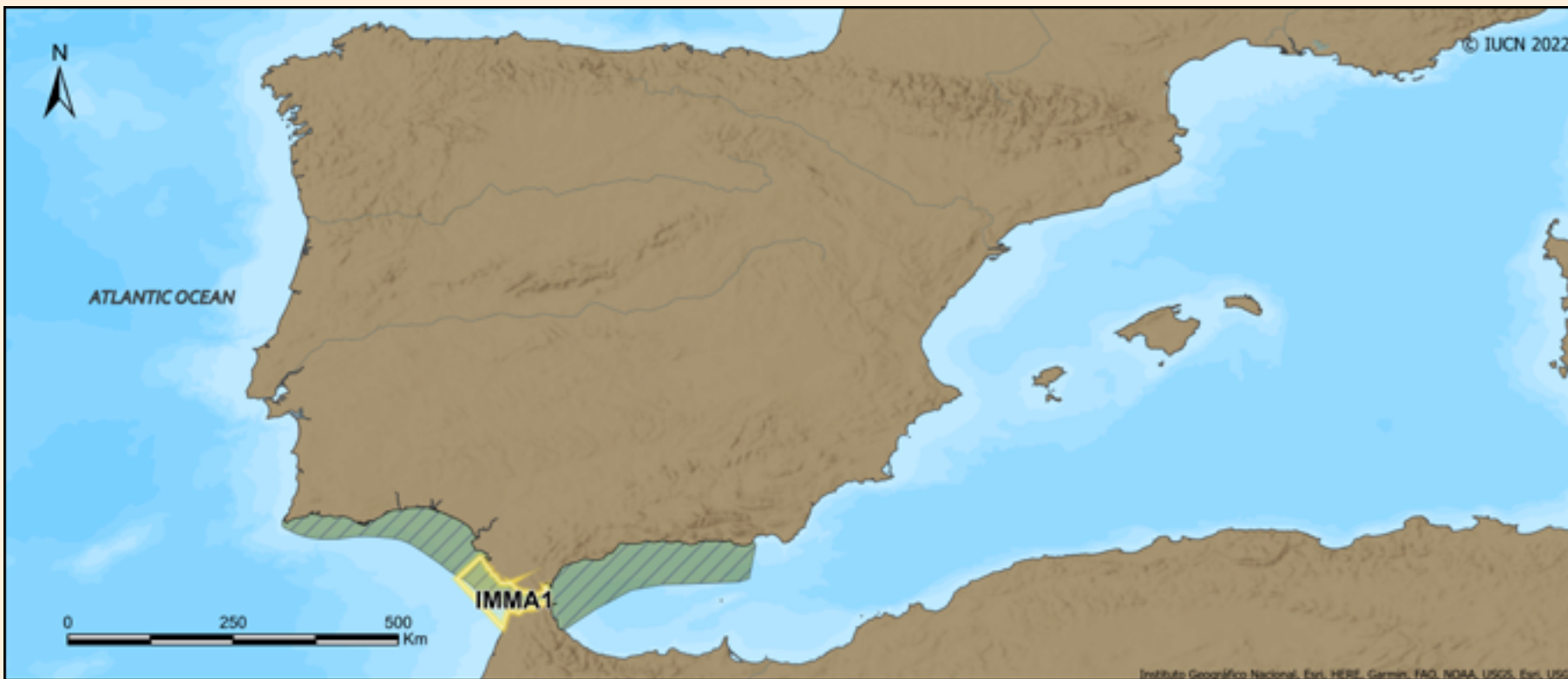


FIGURE 18. The distribution of the Killer whale (*Orcinus orca*) Strait of Gibraltar subpopulation, showing the IMMA designated for this species.
Source: Prepared by the report authors based on the IMMA e-atlas, data from the Barcelona Convention and the IUCN Red List of Threatened Species.



IUCN RED LIST

Year	2019
Category	Critically Endangered
Criteria	C2a(i,ii); D

Depth range and ecology

In the Mediterranean Sea, the Killer whale is considered resident in the Strait of Gibraltar and its adjacent Atlantic waters. Killer whales in the Strait of Gibraltar have specialised in preying on the Atlantic Bluefin Tuna, that migrate through the Strait. They perform at least two foraging strategies, one consists on actively hunting smaller live-ranging tuna, and the other one on depredating larger tuna from the local artisanal drop long-line fishery. These feeding techniques have been linked to social structure and to higher survival and recruitment in pods that interact with fisheries.

There is some evidence for bycatch of Killer whales by the fishery. Additionally, the Strait of Gibraltar is an area of heavy maritime traffic, due to the increase in commercial vessels, whale watching, ferries, and sports fishing boats in recent decades. Furthermore, whale watching may affect foraging efficiency, making it harder for whales to obtain food in a noisier environment.

Current conservation measures

In 2007, the Small Cetaceans' sub-committee of the International Whaling Commission (IWC) recommended that "two governments (Spain and Morocco) to cooperate to monitor the status of the Killer whales and to assess the need for conservation action".

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Annex 1. Conservation status of Mediterranean cetaceans in 2012 and 2022 according to the IUCN Red List of Threatened Species.

Family	Taxon	2012 Report	Details	2022 Report	Details
Balaenopteridae	Fin whale	VU	Panigada, S. & Notarbartolo di Sciara, G. 2012. <i>Balaenoptera physalus</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012: e.T16208224A17549588. https://dx.doi.org/10.2305/IUCN.UK.2012.RLTS.T16208224A17549588.en	EN	Panigada, S., Gauffier, P. & Notarbartolo di Sciara, G. 2021. <i>Balaenoptera physalus</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: e.T16208224A50387979. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T16208224A50387979.en
	<i>Balaenoptera physalus</i> (Mediterranean subpopulation)	C2a(ii)	https://www.iucnredlist.org/species/16208224/16208255 Assessed 2011	C2a(ii)	https://www.iucnredlist.org/species/16208224/50387979 Assessed 2021
Delphinide	Common dolphin	2003	Bearzi, G. 2003. <i>Delphinus delphis</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2003: e.T41762A10557372. https://dx.doi.org/10.2305/IUCN.UK.2003.RLTS.T41762A10557372.en	NE	
	<i>Delphinus delphis</i> Mediterranean subpopulation	EN A2abc	https://www.iucnredlist.org/species/41762/10557372 Assessed 2003		
Delphinide	Common dolphin	NE		CR D	Bearzi, G., Bonizzoni, S. & Santostasi, N.L. 2020. <i>Delphinus delphis</i> (Gulf of Corinth subpopulation) (errata version published in 2021). The IUCN Red List of Threatened Species 2020: e.T156206333A194321818. https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T156206333A194321818.en
	<i>Delphinus delphis</i> Gulf of Corinth subpopulation				https://www.iucnredlist.org/species/156206333/194321818 Assessed 2019
Delphinide	Common dolphin	NE		EN A2cde; C1	Bearzi, G., Genov, T., Natoli, A., Gonzalvo, J. & Pierce, G.J. 2022. <i>Delphinus delphis</i> (Inner Mediterranean subpopulation) (errata version published in 2022). The IUCN Red List of Threatened Species 2022: e.T189865869A210844387.
	<i>Delphinus delphis</i> Inner Mediterranean subpopulation				https://www.iucnredlist.org/species/189865869/210844387 Assessed 2020
Delphinide	Long-finned pilot whale	NE		EN C2a(ii)	Gauffier, P. & Verborgh, P. 2021. <i>Globicephala melas</i> (Inner Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: e.T198785664A198787672. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T198785664A198787672.en
	<i>Globicephala melas</i> Inner Mediterranean subpopulation				https://www.iucnredlist.org/species/198785664/198787672 Assessed 2021
Delphinide	Long-finned pilot whale	NE		EN C2a(ii)	Verborgh, P. & Gauffier, P. 2021. <i>Globicephala melas</i> (Strait of Gibraltar subpopulation). The IUCN Red List of Threatened Species 2021: e.T198787290A198788152. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T198787290A198788152.en
	<i>Globicephala melas</i> Strait of Gibraltar subpopulation				https://www.iucnredlist.org/species/198787290/198788152 Assessed 2021

Annex 1. Conservation status of Mediterranean cetaceans in 2012 and 2022 according to the IUCN Red List of Threatened Species. (Continued)

Family	Taxon	2012 Report	Details	2022 Report	Details
Delphinide	Long-finned pilot whale <i>Globicephala melas</i> Mediterranean subpopulation	DD	Cañadas, A. (2012a). <i>Globicephala melas</i> Mediterranean subpopulation. The IUCN Red List of Threatened Species 2012 : e.T9250A3150309. https://www.iucnredlist.org/species/9250/3150309 Assessed 2010	NE	Replaced by <i>Globicephala melas</i> Strait of Gibraltar subpopulation and <i>Globicephala melas</i> Inner Mediterranean subpopulation
Delphinide	Risso's dolphin <i>Grampus griseus</i> Mediterranean subpopulation	DD	Gaspari, S. & Natoli, A. 2012. <i>Grampus griseus</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012: e.T16378423A16378453. https://dx.doi.org/10.2305/IUCN.UK.2012-1.RLTS.T16378423A16378453.en https://www.iucnredlist.org/species/16378423/16378453 Assessed 2010	EN A2bc	Lanfredi, C., Arcangeli, A., David, L., Holcer, D., Rosso, M. & Natoli, A. 2022. <i>Grampus griseus</i> (Mediterranean subpopulation) (errata version published in 2022). The IUCN Red List of Threatened Species 2022: e.T16378423A210404051. https://www.iucnredlist.org/species/16378423/210404051 Assessed 2020
Delphinide	Striped dolphin <i>Stenella coeruleoalba</i> Mediterranean subpopulation	VU A2bcde	Aguilar, A. & Gaspari, S. 2012. <i>Stenella coeruleoalba</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012: e.T16674437A16674052. https://dx.doi.org/10.2305/IUCN.UK.2012-1.RLTS.T16674437A16674052.en https://www.iucnredlist.org/species/16674437/16674052 Assessed 2010	LC	Lauriano, G. 2022. <i>Stenella coeruleoalba</i> (Mediterranean subpopulation) (errata version published in 2022). The IUCN Red List of Threatened Species 2022: e.T16674437A210833690. https://www.iucnredlist.org/species/16674437/210833690 Assessed 2020
Delphinide	Striped dolphin <i>Stenella coeruleoalba</i> Gulf of Corinth subpopulation	NE		EN B1ab(iii)	Bearzi, G., Bonizzoni, S. & Santostasi, N.L. 2022. <i>Stenella coeruleoalba</i> (Gulf of Corinth subpopulation). The IUCN Red List of Threatened Species 2022: e.T210188066A210188619. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T210188066A210188619.en https://www.iucnredlist.org/species/210188066/210188619 Assessed 2022
Delphinide	Rough-toothed dolphin <i>Steno bredanensis</i> Mediterranean subpopulation	NE		NT D1	Kerem, D., Frantzis, A., Scheinin, A. & Goffman, O. 2021. <i>Steno bredanensis</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: e.T160158217A160158353. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T160158217A160158353.en https://www.iucnredlist.org/species/160158217/160158353 Assessed 2020
Delphinide	Common bottlenose dolphin <i>Tursiops truncatus</i> Mediterranean subpopulation	VU	Bearzi, G., Fortuna, C. & Reeves, R. 2012. <i>Tursiops truncatus</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012: e.T16369383A16369386. https://www.iucnredlist.org/species/16369383/16369386 Assessed 2009	LC	Natoli, A., Genov, T., Kerem, D., Gonzalvo, J., Lauriano, G., Holcer, D., Labach, H., Marsili, L., Mazzariol, S., Moura, A.E., Öztürk, A.A., Pardalou, A., Tonay, A.M., Verborgh, P. & Fortuna, C. 2021. <i>Tursiops truncatus</i> (Mediterranean subpopulation) (errata version published in 2022). The IUCN Red List of Threatened Species 2021: e.T16369383A215248781. https://www.iucnredlist.org/species/16369383/215248781 Assessed 2021 (errata assessment 2022)

Annex 1. Conservation status of Mediterranean cetaceans in 2012 and 2022 according to the IUCN Red List of Threatened Species. (Continued)

Family	Taxon	2012 Report	Details	2022 Report	Details
Delphinide	Common bottlenose dolphin <i>Tursiops truncatus</i> Gulf of Ambracia subpopulation	NE		CR C2a(ii)	Gonzalvo, J. & Notarbartolo di Sciara, G. 2021. <i>Tursiops truncatus</i> (Gulf of Ambracia subpopulation). The IUCN Red List of Threatened Species 2021: e.T181208820A181210985. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T181208820A181210985.en https://www.iucnredlist.org/species/181208820/181210985 Assessed 2020
Delphinide	Killer whale <i>Orcinus orca</i> Strait of Gibraltar subpopulation	NE		CR C2a(i,ii); D	Esteban, R. & Foote, A. 2019. <i>Orcinus orca</i> (Strait of Gibraltar subpopulation). The IUCN Red List of Threatened Species 2019: e.T132948040A132949669. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T132948040A132949669.en https://www.iucnredlist.org/species/132948040/132949669 Assessed 2019
Physeteridae	Sperm whale <i>Physeter macrocephalus</i> Mediterranean subpopulation	EN C2a(ii)	Notarbartolo di Sciara, G., Frantzis, A., Bearzi, G. & Reeves, R. 2012. <i>Physeter macrocephalus</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012: e.T16370739A16370477. https://www.iucnredlist.org/species/16370739/16370477 Assessed 2006	EN C2a(ii)	Pirotta, E., Carpinelli, E., Frantzis, A., Gauffier, P., Lanfredi, C., Pace, D.S. & Rendell, L.E. 2021. <i>Physeter macrocephalus</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: e.T16370739A50285671. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T16370739A50285671.en https://www.iucnredlist.org/species/16370739/50285671 Assessed 2020
Phocoenidae	Black sea harbour porpoise <i>Phocoena phocoena</i> ssp. <i>relicta</i>	EN A1d + 4cde	Birkun Jr., A.A. & Frantzis, A. 2008. <i>Phocoena phocoena</i> ssp. <i>relicta</i> . The IUCN Red List of Threatened Species 2008: e.T17030A6737111. https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T17030A6737111.en https://www.iucnredlist.org/species/17030/6737111 Assessed 2008	In progress	
Ziphiidae	Cuvier's beaked whale <i>Ziphius cavirostris</i> Mediterranean subpopulation	DD	Cañadas, A. (2012b). <i>Ziphius cavirostris</i> (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2012: e.T16381144A16382769. https://www.iucnredlist.org/species/16381144/16382769	VU C2a(ii)	Cañadas, A. & Notarbartolo di Sciara, G. (2018). <i>Ziphius cavirostris</i> (Mediterranean subpopulation) (errata version published in 2021). The IUCN Red List of Threatened Species 2018: e.T16381144A199549199. https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T16381144A199549199.en https://www.iucnredlist.org/species/16381144/199549199 Assessed 2018 (errata assessment 2021)



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