

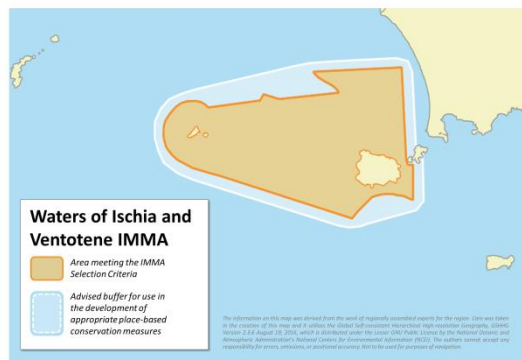
Waters of Ischia and Ventotene Important Marine Mammal Area - IMMA

Description

The area, located in the Tyrrhenian Sea (Italy), is characterized by the presence of complex and varied geological structures, with some submarine canyons. The boundary of this candidate area includes the Cuma's canyon system and the deep valley between Ischia and Ventotene Islands. The variations in bottom topography and bathymetry influence oceanographic processes that concentrate nutrients and structure prey availability vertically in the water column (e.g. upwelling phenomena), consequently attracting key species in the pelagic trophic web like *Meganctiphanes norvegica* (Mussi et al., 1999, 2014). Depth range covers approximately 1000 m isobath. The area is entirely under the Italian jurisdiction.

Based on published (Mussi and Miragliuolo, 2003; Mussi et al., 2004; Pace et al., 2012) and unpublished data by Oceanomare Delphis Onlus regarding marine mammals in the area, 7 cetacean species have been recorded in the area. Information on common dolphin, bottlenose dolphin and fin whale in this IMMA is based on long-time series data collected by Oceanomare Delphis. A total of 1,366 daily visual and acoustic surveys were conducted in 2000-2016, during which about 58,100 km of track line were completed in 10,649 hours of effort.

There were 63 encounters with common dolphins. Encounters and movements were mainly located north of Ischia Island, with different patterns observed over the years (Pace et al., 2012, 2015, 2016). The region corresponds to the central heads of Cuma and Punta Cornacchia canyons, within a wide range of depth and middle-high slope. The encounter rate showed an overall value of



Area Size

1,067 km²

Qualifying Species and Criteria

Common dolphin - *Delphinus delphis*
Criterion A; C (i, ii)

Common bottlenose dolphin -
Tursiops truncatus
Criterion A; C (i, ii)

Fin whale - *Balaenoptera physalus*
Criterion A; C (ii);

Marine Mammal Diversity

[*Physeter macrocephalus*, *Grampus griseus*,
Stenella coeruleoalba]

Summary

Vulnerable Mediterranean fin whales (*Balaenoptera physalus*), Vulnerable common bottlenose dolphins (*Tursiops truncatus*) and Endangered common dolphins (*Delphinus delphis*) have shown regular presence around the waters of Ischia and the Ventotene Islands, within the Tyrrhenian Sea. The complex topography of canyon systems contributes to factors which shape the species' presence and distribution. Oceanographic upwelling promotes primary production leading to an abundance of krill, *Meganctiphanes norvegica*, prey for fin whales seasonally occurring in the area.

0.118 groups/100 km, with a significant steady decline between 2000 and 2016.

There were 91 encounters with bottlenose dolphin. Encounters and movements were principally located in the coastal waters north Ischia Island and over the central heads of the Cuma's submarine canyon. There were sightings of the species in deeper waters, far from shore sites, clearly related to the Cuma's canyons system (Mussi and Miragliuolo, 2003; Mussi et al., 2004; Pace et al., 2012).

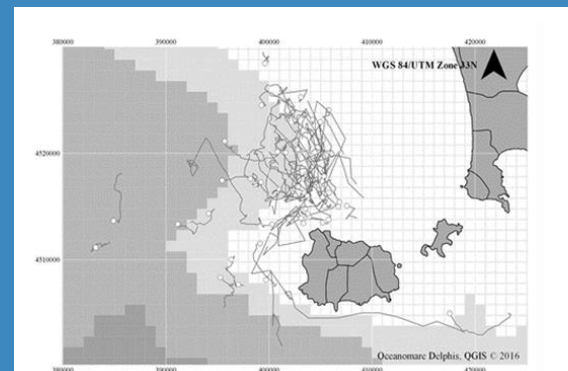
There were 35 encounters with fin whales, principally located NW, W and SW of Ischia Island (over the central heads of the Cuma's submarine canyon, the large, deep valley between Ischia and Ventotene Islands, and the Punta Imperatore Canyon located SW Ischia. While in the past a strong relationship with the Cuma's canyons system was observed (Mussi et al., 1999), in the last decade the degree of association involves also the south-west sighting areas. Sightings occurred mostly in spring-summer.

Criterion A - Species or Population Vulnerability

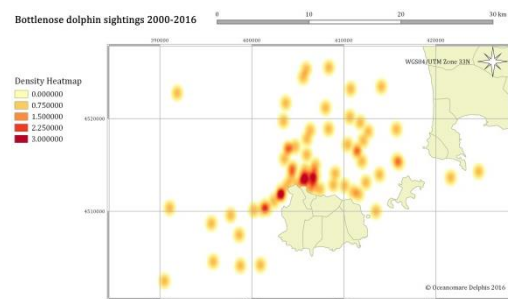
Mediterranean common dolphins are genetically differentiated from those inhabiting the Atlantic Ocean and are subject to several threats including incidental mortality in fishing gear, contaminants, prey depletion, disturbance and climate change (Pace et al., 2016). Declined abundance raised conservation concerns for Mediterranean common dolphin and in 2003 the species was listed as 'Endangered' in the IUCN Red List, based on criterion A2, which refers to a 50% or greater decline in abundance over the last three generations, the causes of which 'may not have ceased or may not be understood or may not be reversible' (Bearzi, 2003).

Mediterranean bottlenose dolphins are genetically differentiated from those inhabiting the contiguous eastern North Atlantic Ocean and Scottish waters and are subject to several threats including incidental mortality in fishing gear, reduced availability of key prey, disturbance, noise and chemical contaminants. In 2012, the IUCN Red List

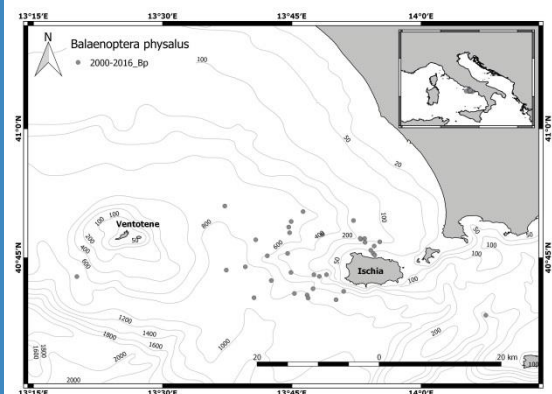
Authority classified the Mediterranean bottlenose dolphins as 'Vulnerable' according to the criteria A2cde and based on a suspected population decline of at least 30% over the last 60 years (Bearzi et al., 2012).



Distribution of the common dolphin sightings around Ischia Island (Oceanomare Delphis Onlus, unpublished).



Density map (Kernel) of the bottlenose dolphin sightings around Ischia island (Oceanomare Delphis Onlus, unpublished).



Distribution of the fin whale sightings around Ischia Island (Oceanomare Delphis Onlus, unpublished)

The resident and genetically isolated population of Mediterranean fin whales, presumed to number at most in the low thousands (and possibly in decline), is subject to several threats including ship strikes, disturbance, noise and chemical contaminants with several potential negative effects at the population level (Notarbartolo di Sciara, 2016). The Mediterranean sub-population has

been listed as 'Vulnerable' in the IUCN Red List according to the followings (Panigada and Notarbartolo di Sciara, 2012): the Mediterranean subpopulation, which is genetically distinct from fin whales in the Atlantic, contains fewer than 10,000 mature individuals; the subpopulation experiences an inferred continuing decline in number of mature individuals; all mature individuals are in one sub-population.

Criterion C: Key Life Cycle

Activities

Sub-criterion Ci: Reproductive Areas

The proposed area fulfils sub-criterion Ci in being an area where evidences on mating, breeding and calving is available for both common and bottlenose dolphins (Mussi and Miragliuolo, 2003; Mussi et al., 2004). Confidence in evidence available is very high thanks to the published/unpublished data.

About 88% of observed common dolphin groups and about 70% of bottlenose dolphin groups included immature individuals, with most of these including calves and neonates. For both species, each age class was encountered during almost all months and field years; parturition has never been observed, although it likely occurs given the observations of extremely small individuals (classified as newborns) showing foetal folds on the flanks and lacking basic motor-coordination skills. The relative frequency of occurrence of groups containing immature animals (in relation to all groups) did not vary annually.

Criterion C: Key Life Cycle

Activities

Sub-criterion Cii: Feeding Areas

The proposed area fulfils sub-criterion Cii in being an area where coastal and pelagic feeding events were regularly observed for all species (Mussi and Miragliuolo, 2003; Mussi et al., 2004; Pace et al., 2012). Confidence in evidence available is very high thanks to the published/unpublished data. In the area, common dolphin was frequently observed to

feed at surface, targeting shoaling fish along the head of the Cuma's canyon (Mussi and Miragliuolo, 2003). The feeding preferences of common dolphins in Ischia area are not entirely known, however, observations of cooperatively herding of schooling fish (mainly the Atlantic saury, *Scomberesox saurus*, European anchovy, *Engraulis encrasicolus*, and European pilchard, *Sardina pilchardus*, as well as fish tosses, circle formations and synchronous diving suggest coordinated feeding strategies.

As for bottlenose dolphin, the species was reported to feed at depth, near rocky banks, and to follow bottom trawlers, as reported in many other Mediterranean sites (Mussi and Miragliuolo, 2003). Fin whale was observed to feed in the area, mainly targeting the Mediterranean krill *Meganctiphanes norvegica* in spring-summer (Mussi et al., 1999, Mussi and Miragliuolo, 2003; Pace et al., 2012).

Supporting Information

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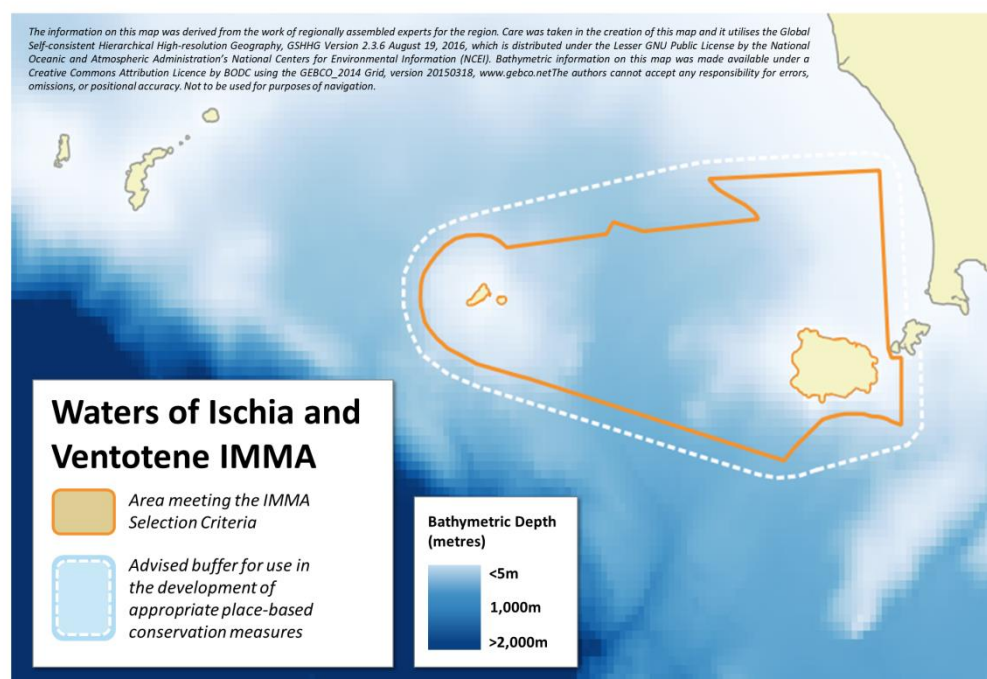
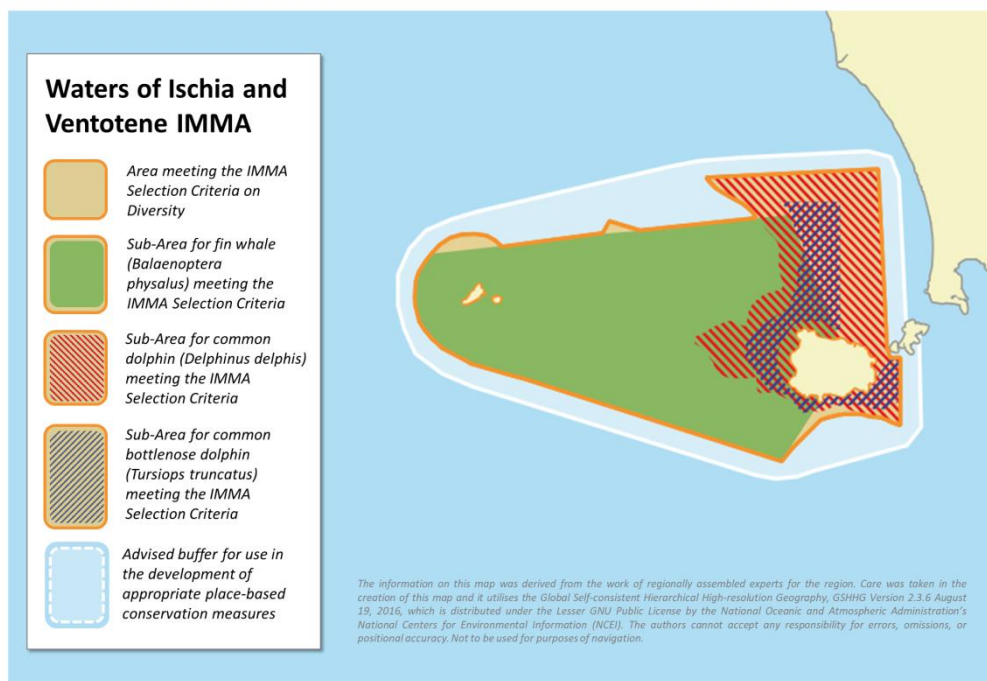


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Annex I

Supplementary Maps



Annex II

List of Primary and Secondary Species

Primary Species – Meet the IMMA Selection Criteria

Scientific Name	Common Name of Species	Population / Subpopulation Name	IUCN Red List Status
<i>Balaenoptera physalus</i>	Fin whale	Mediterranean Subpopulation	Vulnerable
<i>Tursiops truncatus</i>	Common bottlenose dolphin	Mediterranean Subpopulation	Vulnerable
<i>Delphinus delphis</i>	Common dolphin	Mediterranean Subpopulation	Endangered

Secondary Species – Do not individually meet the IMMA Selection Criteria but are present within the area

Scientific Name	Common Name of Species	Population / Subpopulation Name	IUCN Red List Status
<i>Stenella coeruleoalba</i>	Striped dolphin	Mediterranean Subpopulation	Vulnerable
<i>Grampus griseus</i>	Risso's dolphin	Mediterranean Subpopulation	Data Deficient
<i>Physeter macrocephalus</i>	Sperm whale	Mediterranean Subpopulation	Endangered