

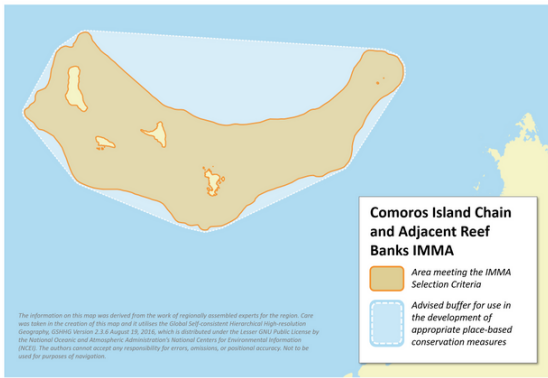
Comoros Island Chain and Adjacent Reef Banks IMMA

Summary

The area of the Comoros (Grande Comore, Mohéli, Anjouan), Mayotte and other reef banks under French jurisdiction (Zélée/Geysier complex and the Glorieuses) includes submarine canyons and a large number of seamounts located between the main islands. Small resident populations of coastal dolphins occur around Mayotte, particularly Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) and endangered Indian Ocean humpback dolphins (*Sousa plumbea*). Throughout the archipelago, high densities of oceanic delphinids have been recorded, particularly spinner dolphins, pantropical spotted dolphins and melon-headed whales (*Peponocephala electra*). Other common species include dwarf sperm whales, Blainville's beaked whales, sperm whales, short-finned pilot whales, and false killer whales. The density of migrating humpback whales is particularly high off the south coast of Moheli, in the coastal waters of Grande Comore and on the Geysier/Zélée complex. Finally, dugongs still occur in small numbers in the lagoon of Mayotte, in the Moheli Marine Park (south coast), but this population has declined greatly over the past four decades.

Description

The Comoros archipelago is located in the northern Mozambique Channel, in the southwest tropical Indian Ocean. The Union of the Comoros consists of four main islands, and many surrounding small islets. The islands of Mohéli, Anjouan, and Grande Comore constitute volcanic islands. Anjouan and Grande Comore feature deep oceanic waters in close



Area Size
62,920km²

Qualifying Species and Criteria

Humpback whale – *Megaptera novaeangliae*.
Criterion A; B2; C1,3b

Blue whale – *Balaenoptera musculus*.
Criterion A; B2; C3b

Sperm whale – *Physeter macrocephalus*.
Criterion A; B2

Melon-headed whale – *Peponocephala electra*.
Criterion B2

Short-finned pilot whale – *Globicephala macrorhynchus*. Criterion B2

Spinner dolphin – *Stenella longirostris*.
Criterion B2

Indo-Pacific Bottlenose dolphin – *Tursiops aduncus*. Criterion B1

Indian Ocean humpback dolphin – *Sousa plumbea*. Criterion A; B1

Pantropical spotted dolphins – *Stenella attenuata*. Criterion B2

False killer whale – *Pseudorca crassidens*.
Criterion B2

Dugong – *Dugong dugon*. Criterion A; B1

Criterion D2 – Marine Mammal Diversity
Balaenoptera musculus, *Dugong dugon*, *Feresa attenuata*, *Globicephala macrorhynchus*, *Grampus griseus*, *Indopacetus pacificus*, *Kogia breviceps*, *Kogia sima*, *Lagenodelphis hosei*, *Megaptera novaeangliae*, *Mesoplodon densirostris*, *Orcinus orca*, *Peponocephala electra*, *Physeter macrocephalus*, *Pseudorca crassidens*, *Sousa plumbea*, *Stenella attenuata*, *Stenella coeruleoalba*, *Stenella longirostris*, *Steno bredanensis*, *Tursiops aduncus*, *Tursiops truncatus*, *Ziphius cavirostris*



Figure 1- False Killer whale inside the Comoros Island Chain and adjacent reef banks IMMA. Photo Credit: Jeremy Kiszka

proximity to the coastline. In contrast, Mohéli has a large reef complex in the south of the island, with shallow waters, including fringing reefs and pinnacles, as well as smaller islands extending to the 100m isobath (around 404 km²).

Mayotte is a French archipelago located in the eastern Mozambique Channel, and is part of the Comoros archipelago. The island is surrounded by a 197 km long barrier reef, with a second double-barrier in the southwest and the immersed reef complex of Iris Bank in the northwest. The lagoon and surrounding reef complexes are 1,500 km² with an average depth of 20 m and a maximum depth of 80 m found in the western, older, region of the lagoon. The insular slope on the exterior of the barrier reef is very steep and contains many submarine canyons and volcanoes.

Geyser Reef and Zélée Bank form an isolated complex northeast of the island of Mayotte. This complex sits atop what is presumed to be a seamount of volcanic origin, and is composed of two distinct areas separated by a channel that exceeds 600 m in depth. Depths on this complex, range from one meter near the reef crest to 40 m in the interior regions. The edge of the complex is characterized by near vertical walls that rapidly drop to depths over 1,000 m within as little as 500 m of their shallowest points. The complex remains completely submerged at low tide, with the exception of a partially emergent western rim of the Geysers Reef.

Glorieuses is a 17 km long coral bank and covering 165 km² with two main coral islands, Grande Glorieuse (7 km²) and Lys island (600 m long). It is located east of the Comoros archipelagos about 250 km from Mayotte and 200 km from Madagascar. Mayotte and Glorieuses waters were declared as a marine protected area in 2010 and 2012, respectively.

Criterion A – Species or Population Vulnerability

This region is a critical habitat for several threatened marine mammal species (particularly the sperm whale, the Indian Ocean humpback dolphin and the dugong), and a migratory corridor for blue whales (Kiszka et al. 2007a, 2007b, 2010a, 2010b, Pusineri et al. 2013). Information on the movements and distribution of sperm whales in this region remain scarce, but multiple sightings between Mayotte and Anjouan suggest the presence of an aggregation (Van Canneyt et al. 2010). Dugongs still occur in the Comoros, especially in the Mohéli Marine Park, but in small numbers (WWF EAME 2004; Muir & Kiszka 2012)

They also occur in small numbers in the lagoon of Mayotte although this species has declined since the early 80's due to hunting and as bycatch in several fisheries. Probably less than 10 individuals are present throughout the lagoon (Kiszka et al. 2007b, Pusineri et al. 2013). Blue whales (*Balaenoptera musculus*) have been recorded on several occasions all year round, particularly off Mayotte (Kiszka et al. 2007a, J. Kiszka, unpublished data).

Criterion B: Distribution and Abundance

Sub-criterion B1: Small and Resident Populations

Small resident populations of coastal dolphins occur in the IMMA, particularly the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) and the Endangered Indian Ocean humpback dolphin (*Sousa plumbea*) around Mayotte (Kiszka et al., 2010b, 2012). Using photo-identification data, from 2004 to 2008, it was estimated that annual abundances of Indo-pacific bottlenose dolphins ranged from 47 ±18 to 98 ±50 individuals (estimated population home range is 978 km², Pusineri et al. 2014).

Indian Ocean humpback dolphins only occur in the lagoon of Mayotte, and less than 5 individuals currently remain in the area (J. Kiszka unpublished data). Some evidence suggests that spinner dolphins occurring around some islands are resident, particularly around Mayotte (Viricel et al. 2016). However, more work is required to improve our knowledge on the residency and movements of this species. Finally the area supports a small, resident and isolated population of dugongs, dependent upon seagrass beds for foraging, particularly around Mayotte and in Mohéli (Muir and Kiszka 2012).

Sub-criterion B2: Aggregations

Throughout the IMMA, high densities of oceanic delphinids have been recorded, particularly the spinner dolphin (*Stenella longirostris*), the pantropical spotted dolphin (*Stenella attenuata*) and

the melon-headed whale (*Peponocephala electra*) (Kiszka et al., 2010a, 2010b, Laran et al. 2017). Other common species include the sperm whale (*Physeter macrocephalus*), the short-finned pilot whale (*Globicephala macrorhynchus*) and the false killer whale (*Pseudorca crassidens*) (Kiszka et al. 2010a, 2010b). During aerial surveys conducted in 2009-2010 in the region, a relatively dense patch of sightings of sperm whales was recorded between the islands of Anjouan and Mayotte (off-effort sighting data, Van Canneyt et al. 2010).

(Globice 2005, Kiszka et al. 2010a, Ersts et al. 2011). Densities of humpback whales is particularly high off the south coast of Moheli, in the coastal waters of Grande Comore and on the Geyser/Zélée complex (Kiszka et al. 2010a, Ersts et al. 2011). The densities of humpback whales on the Iris, Zélée and Geyser banks ranged from 0.027 to 0.618 whales/nm² across three reef banks in 2002 and 2003 (Ersts et al. 2011). Presumably all other species described as being present year-round also reproduce in the area.

Criterion C: Key Life Cycle Activities

Sub-criterion C1: Reproductive Areas

This region is a migratory destination for humpback whales (*Megaptera novaeangliae*) between July and October (austral winter), where the majority of encountered groups are mother-calf pairs (Kiszka et al. 2010a, Ersts et al. 2011). The high proportion of mother-calf pairs suggests that the surrounding waters of Mayotte, the Geyser/Zélée reef complex, Glorieuses and the other Comorian islands constitute a nursing ground for this species in the region

Sub-criterion C3: Migration Routes

C3b – Migration / Movement Area

The region is a known breeding ground for humpback whales during the austral winter, but also a potential migratory corridor for other baleen whales and male sperm whales. Sightings of blue whales in August 2016 and April 2007 (Kiszka et al. 2007) suggest that pygmy blue whales (*B. m. breviceauda*) and possibly Antarctic blue whales (*B. m. intermedia*) migrate through the Comoros archipelago.

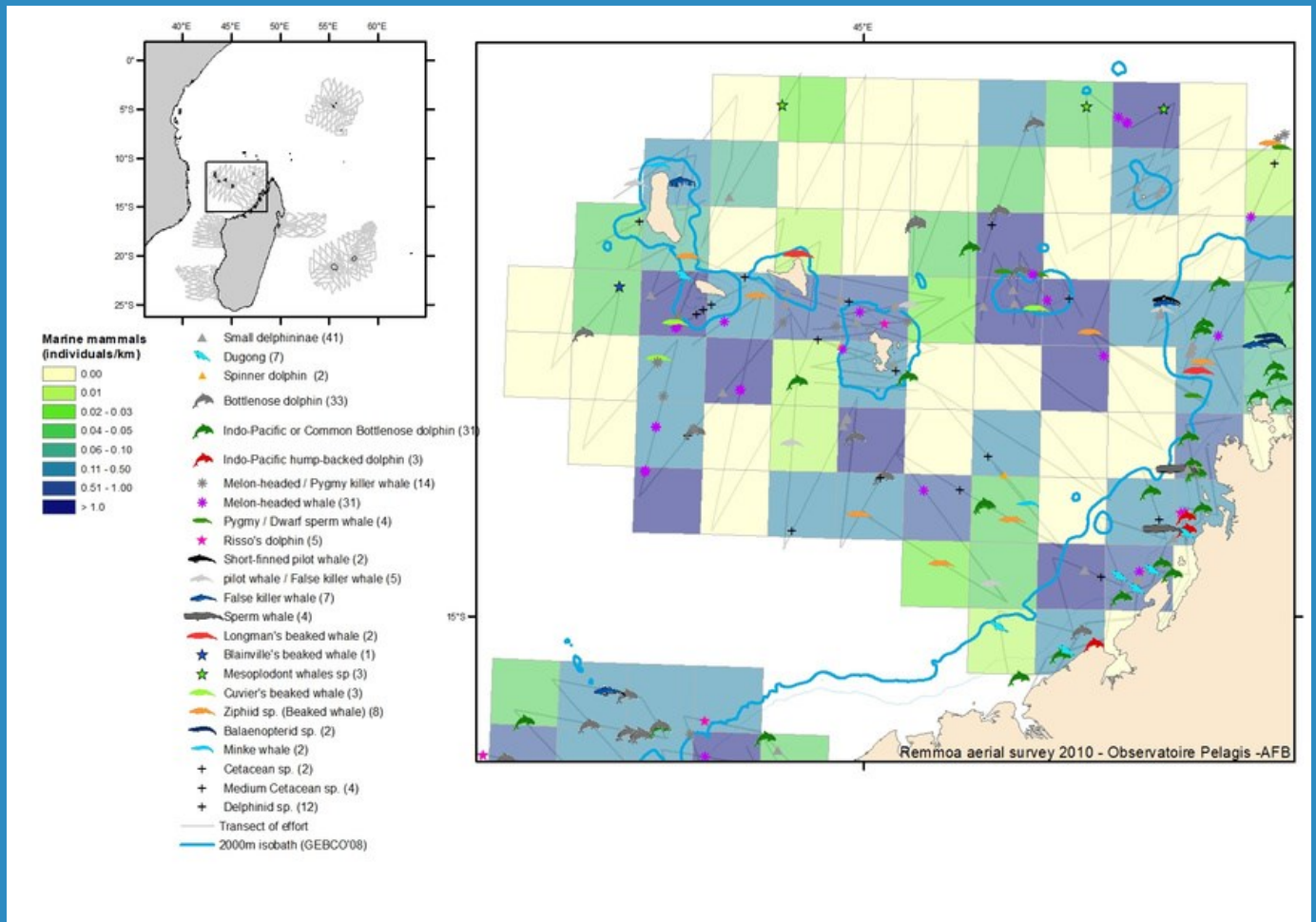


Figure 3 - Map showing the location of marine mammal sightings made by the REMMOA surveys around the Comoros Island China and adjacent reef banks IMMA

Criterion D: Special Attributes

Sub-criterion D2: Diversity

The diversity of species present in the IMMA is sustained by a high variation of ocean, coastal, reef and lagoon habitats, with 22 species of cetaceans recorded and the dugong (Kiszka et al. 2010a, 2010b, Laran et al. 2017). These cetacean species include sperm whale (*Physeter macrocephalus*), humpback whale (*Megaptera novaeangliae*), blue whale (*Balaenoptera musculus*), indo-Pacific and common bottlenose dolphins (*Tursiops aduncus*, *Tursiops truncatus*), spinner dolphin (*Stenella longirostris*), pantropical spotted dolphin (*Stenella attenuata*), Indian Ocean humpback dolphin (*Sousa plumbea*), melon-headed whale (*Peponocephala electra*), short-finned pilot whale (*Globicephala macrorhynchus*), false killer whale (*Pseudorca crassidens*), Risso's dolphin (*Grampus griseus*), pygmy killer whale (*Feresa attenuata*), Fraser's dolphin (*Lagenodelphis hosei*), killer whale (*Orcinus orca*), Longman's beaked whale (*Indopacetus pacificus*), Cuvier's beaked whale (*Ziphius cavirostris*), Blainville's beaked whale (*Mesoplodon densirostris*), pygmy sperm whale (*Kogia breviceps*), dwarf sperm whale (*Kogia sima*), dugong (*Dugong dugon*), striped dolphin (*Stenella coeruleoalba*), and rough-toothed dolphin (*Steno bredanensis*).

Supporting Information

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Aknowledgements

The participants of the 2019 IMMA Regional Expert Workshop held in Salalah, Oman for the Identification of IMMAs in the Western Indian Ocean and Arabian Seas.



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