

## Area Size

726 km<sup>2</sup>

## Qualifying Species and Criteria

Indo-Pacific bottlenose dolphin  
*Tursiops aduncus*  
Criterion B1

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

Humpback whale  
*Megaptera novaeangliae*  
Criterion C1

## Marine Mammal Diversity

*Dugong dugon*, *Megaptera novaeangliae*, *Sousa plumbea*, *Stenella longirostris*, *Tursiops aduncus*

## Summary

The Kisite-Shimoni IMMA is located in the coastal waters of southern Kenya adjacent to the Tanzania border. Within the IMMA is the Kisite-Mpunguti National Marine Park and Reserve. Research in this area shows that there is a small resident population of Indo-Pacific bottlenose dolphins that are the regular target of dolphin watching tourism. The population shows a high degree of site fidelity and is reliant on the habitat within the area for both feeding and breeding. Indian Ocean humpback dolphins and spinner dolphins are also observed within the Kisite-Shimoni area. The habitat is used by humpback whales from IWC Breeding Stock C for both calving and nursing activities.

# Kisite-Shimoni IMMA

## Description

The Kisite-Shimoni IMMA is located in shallow water of the southern Kenyan coast adjacent to the border with Tanzania. Within the boundaries of the IMMA is Wasini Island, and the Kisite-Mpunguti Marine Protected Area (KMMPA) which is comprised of the Kisite Marine Park, the largest no-take area in Kenya (28 km<sup>2</sup>), and the adjacent Mpunguti Marine Reserve, where only artisanal fishing is allowed (11 km<sup>2</sup>). This area is part of the transboundary EBSA named Pemba-Kisite-Mpunguti, located across the border of Tanzania and Kenya.

The near-shore waters of the Shimoni coast are home to resident Indo-Pacific bottlenose and humpback dolphins. Based on field-work conducted between January 2006 and December 2009, the population size was estimated as ranging from 19 individuals (95% CI: 11–33) to a maximum of 104 dolphins (95% CI: 78–139) with a mean of 62 dolphins

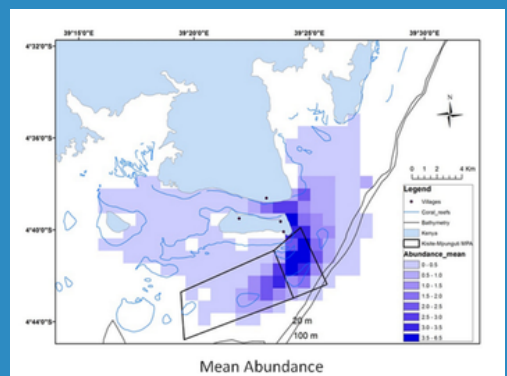


Figure 1 – Replicated from Pérez-Jorge et al., 2016 – distribution maps of predicted mean abundance of Indo-Pacific bottlenose dolphins in the Kisite-Shimoni area. Black box is the MPA.

estimated (SE: 6.66) (Pérez-Jorge et al. 2016). There was a very high degree of residence of individuals within the IMMA and a low proportion of transient individuals in the population (Pérez-Jorge et al. 2016). Abundance estimates were roughly stable from 2006 to 2009 (Pérez-Jorge et al. 2016). Studies demonstrate that the tourist boat interactions affected dolphins' behavioural time budgets, with a significant decrease in the overall amount of time travelling and an increase in diving time (Pérez-Jorge et al. 2017). Integrative ecological modelling showed that Indo-Pacific bottlenose dolphins preferentially selected reefs inside the MPA and along the east side of Wasini Island (adjacent to the 100m isobaths) and these were important for foraging (Pérez-Jorge et al. 2015). The waters are regularly used for reproductive activities and by mother-calf pairs (Pérez-Jorge et al. 2017).

Indian Ocean humpback dolphins also occur within the IMMA although in lower numbers and less regularly than Indo-pacific bottlenose dolphins (Morley et al. 2011). Between 2006 and 2009 Indian Ocean humpback dolphins were seen 88 times with an encounter rate of 0.03 sightings/10km (SD=0.12). Using photo-identification a total of 28 individuals were identified (Morley et al. 2011) Mark-recapture methods for open populations (Jolly-Seber model) were used to estimate the abundance of humpback

dolphins inhabiting the Wasini Channel resulting in a best estimate of 104 individuals (95% CI 67-160) (Meyler et al. 2011). The core range utilised by *Sousa plumbea* is closer to shore than Indo-pacific bottlenose dolphins (Morley et al. 2011, Meyler et al. 2011).

The edge of the IMMA connects to the deeper waters of the IMMA for the Greater Pemba Channel, and Spinner dolphins are recorded, as well as Humpback whales on their seasonal migrations (sightings summarized in the newsletter of the Kenya Marine Mammal Network <https://kenyammnetwork.wixsite.com/kmmnetwork/newsletter>).



Figure 2- A humpback whale, *Megaptera novaeangliae*, leaps inside the Kisite-Mpunguti IMMA. Photo credit: Global Vision International Kisite-Mpunguti

There have been occasional sightings of dugong near Funzi Island, Sii Island and Vanga within the IMMA and this may be one of the few remaining refuges in Kenya for the endangered dugong (Cockcroft et al 2018, Findlay et al. 2011).

The boundary of the IMMA is defined by the Kenya-Tanzania border in the south, which also marks a change in habitat and reduction in depth of the Pemba Channel.

## **Criterion A: Species or Population Vulnerability**

The Indian Ocean humpback dolphin is currently designated under the IUCN Red List as Endangered (Braulik et al., 2017). There is a population of Indian Ocean humpback dolphins that occur within the waters of the area that is estimated to number approximately 100 individuals (Morley et al. 2011, Meyler et al. 2011).

## **Criterion B: Distribution and Abundance**

### **Sub-criterion B1: Small and Resident Populations**

The near-shore waters of the Shimoni coast are home to resident Indo-Pacific bottlenose and humpback dolphins. Based on a robust dataset of 367 photo-identification sessions (137 individuals identified) collected over 551 dedicated vessel-based surveys (~13850km of survey effort) between January 2006 and December 2009, the population size of Indo-Pacific bottlenose dolphins was estimated as ranging from 19 individuals (95% CI: 11–33) to a maximum of 104 dolphins (95% CI: 78–139) with a mean of 62 dolphins estimated (SE: 6.66) (Pérez-Jorge et al. 2016). The individual recapture rate ranged from 1 to 75 with

an average of 19 (SD: 19.76) recaptures along the study period 2006-2009. There was a very high degree of residence of individuals within the area and a low proportion of transient individuals in the population (Pérez-Jorge et al. 2016). Abundance estimates were roughly stable from 2006 to 2009 (Pérez-Jorge et al. 2016).

Similarly, it is estimated that there are approximately 104 Indian Ocean humpback dolphins that utilize the area (Meyler et al. 2011).

## **Criterion C: Key Life Cycle Activities**

### **Sub-criterion C1: Reproductive Areas**

Long-term photo ID programs provides strong information on the importance of Kisite as a reproductive area for the Indo-Pacific bottlenose dolphin. From 2006 to 2012, a total of 182 individuals were identified around the Kisite-Mpunguti Marine Protected Area and surrounding waters, with at least 27 individuals identified as females, accounting for approximately 15% of the population (Pérez-Jorge, S, unpublished data; Kenya Marine Mammal Network Newsletter 3). This area is an important reproductive habitat for humpback whales, as it is used regularly every year for calving and nursing. During the period 2007-2012, 61 individuals were photo-identified passing through the study area of Kisite-Mpunguti MPA (Pérez-Jorge unpublished data, Kenya Marine Mammal Network Newsletter 3).

## Supporting Information

Braulik, G. T., K. Findlay, S. Cerchio, R. Baldwin and W. Perrin (2017). "Sousa plumbea." *The IUCN Red List of Threatened Species* 2017: e.T82031633A82031644. Downloaded on 06 December 2017.

Cockcroft, V.G., Findlay, K.P. Guissamulo, A.T., Lindsay West, Mohamed, M. 2018. *Dugongs (Dugong dugon) of the Western Indian Ocean Region: – Identity, Distribution, Status, Threats and Management*. Western Indian Ocean Science Association Final Technical Report. 143pp.

Heithaus, M., Kiszka, J., Cadinouche, A., Dulau-Drouot, V., Boucaud, V., Pérez-Jorge, S. and Webster, I. 2017. *Spatial variation in shark-inflicted injuries to Indo-Pacific bottlenose dolphins (Tursiops aduncus) of the western Indian Ocean*. *Marine Mammal Science*, 33: 335-341 Kenya Marine Mammal Network. 2012-2013. Newsletters 1-4. Available online: <https://kenyammnetwork.wixsite.com/kmmnetwork/newsletter>

Pérez-Jorge, S., Louzao, M., Oro, D., Pereira, T., Corne, C., Wijtten, Z., Gomes, I., Wambua, J. and Christiansen, F. 2017. *Estimating the cumulative effects of the nature-based tourism in a coastal dolphin population from southern Kenya*. *Deep Sea Research II: Topical Studies in Oceanography*. 140: 278-289.

Pérez-Jorge, S., Gomes, I., Hayes, K., Corti, G., M. Louzao, M and Oro, D. 2016. *Effects of nature-based tourism and*

*environmental drivers on the demography of a small dolphin population*. *Biological Conservation*, 197: 200-208.

Pérez-Jorge, S., Pereira, T., Corne, C., Wijtten, Z., Omar, M., Katello, J., Kinyua, M. Oro, D. and Louzao, M. 2015a. *Can static environmental drivers on the demography of a small dolphin population*. *Biological Conservation*, 197: 200-208.

Pérez-Jorge, S., Pereira, T., Corne, C., Wijtten, Z., Omar, M., Katello, J., Kinyua, M. Oro, D. and Louzao, M. 2015a. *Can static habitat protection encompass critical areas for highly mobile marine top predators? Insights from coastal East Africa*. *PLoS ONE* 10(7).

Pérez-Jorge, S., Pereira, T., Corne, C., Wijtten, Z., Omar, M., Katello, J., Kinyua, M. Oro, D. and Louzao, M. 2015b. *Integrative assessment of human dimension on the conservation of the Indo-Pacific bottlenose dolphin in Kenya*. *Devotes-Euro Marine Summer School, Spain*.

Findlay, K.P., Cockcroft, V.G., and AT Guissamulo. 2011. *Dugong abundance and distribution in the Bazaruto Archipelago, Mozambique*. *African Journal of Marine Science* 2011, 33(3): 441-452

Morley, K., Pérez-Jorge, S., Omar, M., Lemarkat, R., and Corti, G. 2011. *Abundance and spatial distribution of Indo-Pacific humpback dolphins (Sousa chinensis) and possible threats on the south coast of Kenya*. *Proceeding in the 7th Western Indian Ocean Marine Science Association, Kenya*.

Gilbert Mwang'ombe, M., Pérez-Jorge, S., Katana Charo, K., Kahindi Yaa, J., Njuguna, N., Trott, S.J., and Spilsbury, J.H. 2015. *Cetacean species distribution and encounter rates in the Malindi – Watamu National Marine Reserve 2011 – 2014. Proceeding in the 9th Western Indian Ocean Marine Science Association, Kenya.*

Pérez-Jorge, S., Gomes, I., Morley, K., Omar, M., Lemarkat, R., Oro, D., Karczmarksj, L and Corti, G. .2011. *Cetaceans around Kisite-Mpunguti Marine Protected Area (Kenya): Spatio-temporal distribution and encounter rate. Proceeding in the 7th Western Indian Ocean Marine Science Association, Kenya.*

Pérez-Jorge, S., Gomes, I., Crouthers, R., Lemarkat, R. and Corti, G. .2010. *Indo-Pacific bottlenose dolphin (Tursiops aduncus) population study of Kisite-Mpunguti Marine Protected Area, East Africa. Proceeding in the European Cetacean Society Annual Meeting in Stralsund, Germany.*

## 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. . Funding for the identification of this IMMA was provided to the Global Ocean Biodiversity Initiative by the International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. Support was also provided by Whale and Dolphin Conservation and the Tethys Research Institute.



Supported by:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

based on a decision of the German Bundestag

**MARINE MAMMAL PROTECTED AREAS TASK FORCE**

IUCN SSC WCPA

**IMMA**

**Gobi**

**TETHYS** since 1986

**WDC** WHALE AND DOLPHIN CONSERVATION

**Suggested Citation: IUCN-MMPATF (2020). Kisite-Shimoni IMMA. IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force, 2020.**

**PDF made available for download at:**  
<https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/WesternIndianOcean/Kisite-Shimoni-WesternIndianOcean.pdf>