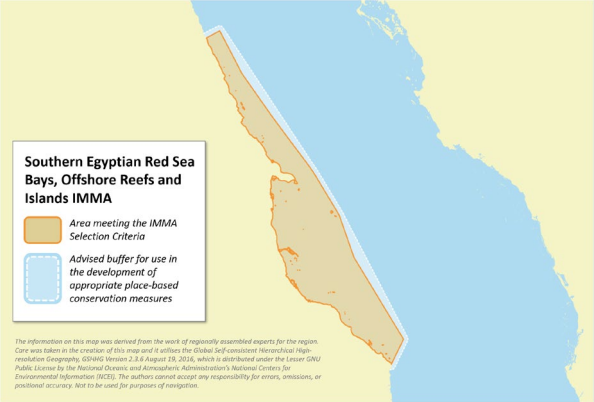

Area Size

19,425 km²

Qualifying Species and Criteria

Dugong – *Dugong dugon*
Criteria A, B1

Indian Ocean humpback dolphin – *Sousa plumbea*
Criterion A

Risso's dolphin – *Grampus griseus*
Criterion B1

Spinner dolphin – *Stenella longirostris*
Criteria B1, C1

Indo-Pacific bottlenose dolphin – *Tursiops aduncus*
Criterion B1

Common bottlenose dolphin – *Tursiops truncatus*
Criterion B2

Marine Mammal Diversity

Balaenoptera edeni, Dugong dugon, Grampus griseus, Pseudorca crassidens, Sousa plumbea, Stenella longirostris, Tursiops aduncus, Tursiops truncatus, Stenella attenuata

Southern Egyptian Red Sea Bays, Offshore Reefs and Islands IMMA

Summary

The Egyptian Red Sea waters south of Marsa Alam encompass diverse marine habitats, including coastal bays, offshore reefs, and islands, supporting populations of nine marine mammal species. The northern parts of the area feature habitats used by resident dugong (Dugong dugon) and spinner dolphins (Stenella longirostris).¬┼ These populations have become the target of popular, intense, and in many cases, unregulated "swim-with" tourism operations that take place in their resting and calving areas. Conversely, the southern portion of the area is remote and less affected by coastal development and tourism. Scientific research on marine mammals in this area commenced in the early 2000s and has contributed significantly to the understanding of spinner dolphin and dugong behaviour, as well as species occurrence, distribution and ecology in the region.

Description

The IMMA is located in Egypt's Red Sea Governorate, an administrative division of Egypt including most of the Red Sea coastal area, from the Suez Canal to the border with Sudan. It encompasses the entire Marsa Alam administrative region, which ranges from Port Ghalib in the north (25.6˚N, 34.1˚E) to Shalatin in the south (23.5˚N; 33.5˚E), and includes a range of diverse marine and terrestrial habitats. The region includes two national parks: Wadi El Gemal and Gabel Elba.

This IMMA is divided in two by the projecting peninsula of Ras Banas. The area north of Ras Banas is narrower, with the continental slope closer to the coastline. Here, the straight coastline is occasionally interrupted by bays ("marsas") featuring sandy beaches and seagrass beds, which interrupt the otherwise continuous fringing reef. The shelf contains isolated reefs ("shaab") several km from the coast that form sheltered lagoons, such as Marsa Alam Reef (25.073˚N, 34.936˚E), Samadai Reef (24.987˚N,

34.998˚E) and Satayah Reef (24.162˚N, 35.692˚E). The latter is the major coral formation in a wider system of shallow reefs called Fury Shoal, which is considered among the most pristine sites in the Egyptian Red Sea. The northern portion of the IMMA also features a few small, low-lying, uninhabited islands. A portion of the IMMA north of Ras Banas is part of the Wadi El Gemal - Hamata National Park (IUCN Category II park) established in 2003 (EEAA, 2019).

South of Ras Banas, the shelf (and IMMA) becomes wider. The area immediately to the south of the cape is called Foul Bay, due to a system of shallow, uncharted reefs that make navigation very difficult. Foul Bay includes a cluster of small coral reefs and pinnacles known as St. John's reef area ~5-40 km off the coast, reaching the surface from depths up to 200m. Additionally, the islands of Mukkawar (23.836˚, 35.810˚E), Zabargad (23.610˚N, 36.196˚E) and Rocky (23.563˚N, 36.246˚E), lie within 70 km of the coast.

Further to the south, the coastal reefs off the Hala'ib triangle are in a disputed area between Egypt and Sudan, administered *de facto* by Egypt since the mid-1990s. The great majority of the triangle, including its coastal waters and marine habitats, is included in Egypt's Gabel Elba National Park. This area includes a complex system of reefs, islands and coastal bays within the 50m-depth contour, and open waters up to 600m deep. This region is under-developed and remote, inaccessible to tourists from the land, and only very occasionally included in boat-based diving tours. Both the type and extent of human activities carried out in the waters off Hala'ib are not well known, nor are the potential threats to marine biodiversity and habitats. Military bases are located along the Hala'ib coastline, and preliminary information suggests that some artisanal fisheries (some indulging in illegal practices) occur in the region.

Criterion A: Species or Population Variability

The IMMA hosts Endangered Indian Ocean humpback dolphins (*Sousa plumbea*) and Vulnerable Dugongs (*Dugong dugon)* (Fig. 1). Dugongs are believed to have once been widely distributed along the entire Red Sea coastal area wherever appropriate habitat and seagrass meadows existed. They persist today scattered in fragmented locations, including the many marsas along the coast of the northern portion of the IMMA (Hanafy et al., 2006; Nasr et al., 2019; Shawky et al., 2017), all the way to the border with Sudan (and beyond), and perhaps also in the reef lagoons between Foul Bay and Hala'ib. The species is listed as Vulnerable by the IUCN, although the Red Sea and Gulf of Aden population is considered Data Deficient (Marsh & Sobtzick, 2015). *Sousa plumbea* are present, although infrequently encountered, in the shallowest portions of the IMMA. Their overall abundance is unknown, but they are thought to occur in low numbers in shallow habitats along the Egyptian coast with the exclusion of the Gulf of Aqaba. Few sightings are reported along the coast surrounding Fury Shoal, and in the vicinity of Shalatin (Costa, 2015; Notarbartolo di Sciara et al., 2017).

Figure 1: A silhouette of a Dugong (*Dugong dugon*).
Photo: Mohamed Ismail

Criterion B: Distribution and Abundance Sub-criterion B1: Small and Resident Populations

Tursiops aduncus (Fig. 5) is regularly observed throughout the IMMA, most often in proximity to coral reefs or in sheltered lagoons, and more occasionally in the coastal bays of the IMMA (Costa, 2015; Notarbartolo di Sciara et al., 2017). Population abundance estimates of Indo-Pacific bottlenose dolphins in the area north of Ras Banas (Fig. 2)

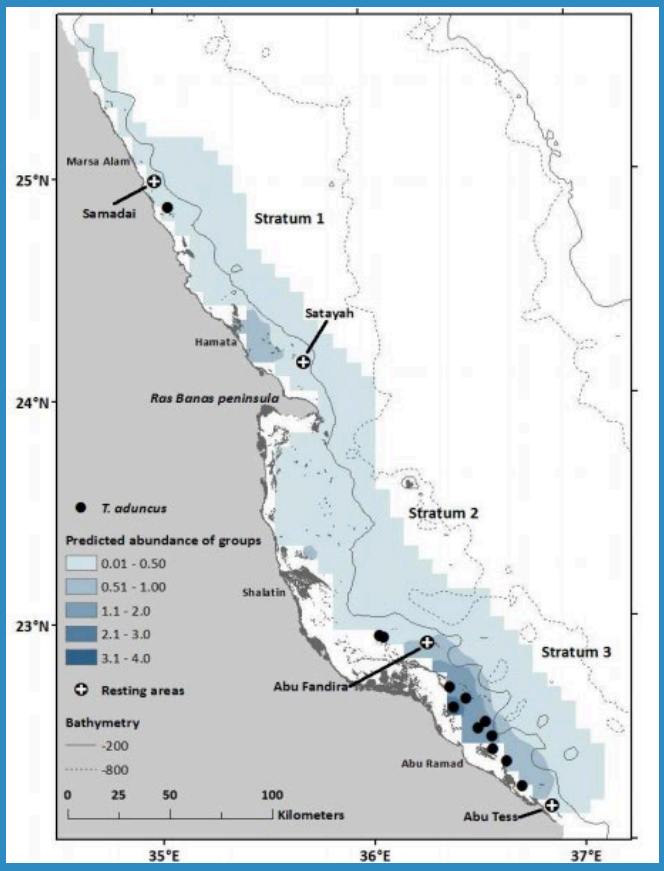

Figure 2: Surface map of predicted abundance of groups of Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) in the southern Egyptian Red Sea (summers 2010, 2011 and 2012). From Costa, 2015.

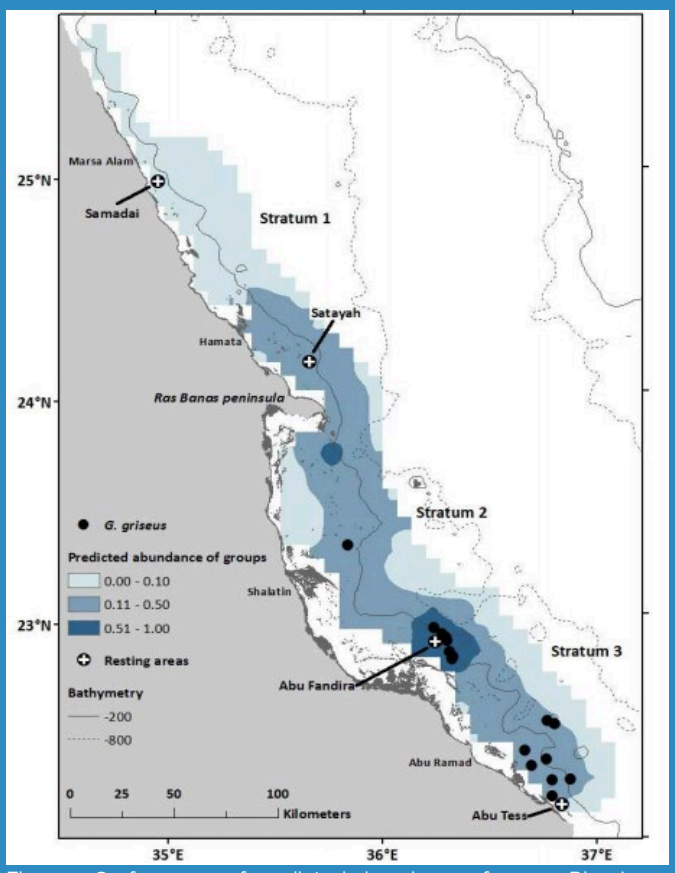

Figure 3: Surface map of predicted abundance of groups Risso's dolphin (*Grampus griseus*) in the southern Egyptian Red Sea (summers 2010, 2011 and 2012). From Costa, 2015.

indicate a population of 103 individuals (CV=0.34; Costa, 2015), often encountered in mixed-species groups with spinner dolphins. Recaptures of the same individuals over the relatively few sampling occasions available suggest the importance of the area for the group (Costa, 2015). A similar situation was observed south of Ras Banas, where the abundance estimate for the species was 108 individuals (CV=0.47, n=20; Costa, 2015). Four out of 46 distinctive individuals were recaptured in different years (three in 2010 and 2012, one in 2010 and 2011) at sites relatively close to each other (mean distance=38 km, SD=22.6), suggesting some level of long-term site fidelity to this region. None of the distinctive individuals encountered south of Ras Banas was ever recaptured north of it (Costa, 2015). Risso's dolphins were concentrated in the area from Abu Fandira to the IMMA's southern boundary (Fig. 3). Groups ranged from 1 to 17 individuals and occasionally included calves. Of 74 distinctive, identified individuals, 11 were recaptured over the course of a 2010-2012 study (Costa, 2015). The pattern and location of recaptures led to suggest that the whole area, from St. John's reefs to Qubbat'Isa (Abu Tess in the reference cited), might be used by the species (Costa, 2015).

Photo-identification data for 2006 and 2011-2014 show that the Samadai and Satayah spinner dolphin reef-associated populations include long-term resident individuals of both sexes (Cesario, 2017; Fumagalli, 2016; Fumagalli et al., 2019). At Samadai Reef, females exhibit stronger site fidelity than males, especially in the warm season (mid-April to mid-October) (Cesario, 2017). Capture-recapture routines returned stable, reef-associated Samadai and Satayah populations of ~200 non-calf individuals (Cesario, 2017; Fumagalli et al., 2019), whereas species abundance in the area was estimated to be 6,961 individuals (CV=0.26; Costa, 2015). The area is also host to a small, fragmented resident population of dugongs (Hanafy et al., 2006; Nasr et al., 2019; Shawky et al., 2017). The photo-identification capture histories of 30 distinctive individual dugongs in the

northernmost portion of the IMMA suggested high fidelity to a specific site or to adjacent sites (Nasr et al., 2019, Shawky et al., 2017).

Criterion B: Distribution and Abundance Sub-criterion B2: Aggregations

A relatively large group of common bottlenose dolphins (*Tursiops truncatus*) inhabits Fury Shoal and surrounding waters. The only estimate available based on mark recapture data suggest that about 400 (CV=0.31) individuals use an area that extends about 200 km north and 200 km south of Fury Shoal. It is important to notice however, that the majority of the bottlenose dolphin sightings and individual recaptures occurred in Fury Shoal waters, thus suggesting that the area might be the core of the population, with some individuals dispersing further away. This is also confirmed by habitat modelling analyses showing that the maximum values of predicted abundances of groups for the species have their centre in the Fury Shoal area (Costa, 2015).

Figure 4: Mother-neonate calf pair of spinner dolphin (*Stenella longirostris*) in Samadai Reef, Egypt. Photo: Amina Cesario

Criterion C: Key Life Cycle Activities Sub-criterion C1: Reproductive Areas

Mating, pregnancy, occurrence of newborn and older calves, as well as nursing and nurturing behaviours were regularly observed in the spinner dolphin schools encountered at the resting areas of Samadai and Satayah Reef (Fig 4). Mating is a behaviour commonly observed in the resting school (Cesario, 2017; Fumagalli et al., 2019), as already reported elsewhere (Norris et al., 1994; Silva-Jr. et al., 2005). The mating system of the spinner dolphins of Samadai Reef is polygynous (Cesario, 2017). Mother and calf pairs, including calves aged 1-3 years and juveniles, are common year-round (Cesario, 2017; Ismail, 2017; Notarbartolo di Sciara et al., 2009). Calving season corresponds to the summer months of June-August, when newborn calves are recorded (Cesario, 2017; Fumagalli et al., 2019; Ismail, 2017; Notarbartolo di Sciara et al., 2009). Visual, underwater observations documented the regular presence of pregnant females within the resting schools (Cesario, 2017; Fumagalli et al., 2019; Ismail, 2017). Births have never been observed inside the reef lagoon, distinctive pregnant females have been encountered in the few days immediately preceding and succeeding the estimated delivery date (Cesario, 2017; Ismail, 2017), thus suggesting that the area is safe and suitable during vulnerable phases of late pregnancy and while caring for newborn calves. The features of the resting area appear to be ideal not only for resting, but also for nursing and nurturing of newborn as well as older calves. At Qubbat'Isa Reef, calves were recorded in all sightings (Fumagalli, 2016). During three encounters in the lagoon of Abu Fandira Reef in July 2012, groups ranged in size from 24 to 55 individuals. These schools always included calves, in two cases newborn calves. This may indicate that the June-August birth season identified in Samadai and Satayah reefs also applies here. As hypothesized for the northern, better known spinner dolphin resting areas, these southern, less-known sites appear to possess ideal features not only for resting, but also for nursing and nurturing. Following the observation of small dugong feeding trails, as well as the sightings of several calves, several of the coastal bays and areas in the northern portion of the IMMA (i.e. Ras Bagdady, Marsa Egla and Marsa Assalaya) were suggested to be nursery ground for the dugong (Shawky et al., 2017, 2016).

Supporting Information

Baird, R.W. 2018. *Pseudorca crassidens*. The IUCN Red List of Threatened Species 2018: e.T18596A50371251. http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T18596A50371251.en. Downloaded on 02 August 2019.

Bonatti, E. 1985. Punctiform initiation of seafloor spreading in the Red Sea during transition from a continental to an oceanic rift. Nature, 316 (6023): 33-37.

Cesario, A. 2017. Population ecology of spinner dolphin (*Stenella longirostris*) in an offshore resting habitat in the Red Sea (Doctoral dissertation). University of Hong Kong (Hong Kong). https://hub.hku.hk/handle/10722/240645.

Cesario, A. 2008. Uso dell'habitat e abitudini alimentari di *Stenella longirostris* (Gray, 1828) nel Mar Rosso egiziano (M.Sc. dissertation). Università degli Studi di Milano (Italy).

Costa, M. 2015. Abundance and distribution of Delphinids in the Red Sea (Egypt) (Doctoral dissertation). University of St. Andrews (United Kingdom).

Costa, M., Fumagalli, M., & Cesario, A. 2019. Review of Cetaceans in the Red Sea. In Rasul, N.M.A. and Stewart, I.C.F. (Eds.), Oceanographic and Biological Aspects of the Red Sea, pp. 281–303. Cham: Springer International Publishing.

De Montpellier, G. 2007. Eco-ethological approaches of the Spinner Dolphin (*Stenella longirostris*, Gray, 1828) in Southern Red Sea (Egypt) with a view of improving management of the Marine Protected Area Sha'ab Samadai reef. (M.Sc. dissertation). Université Catholique de Louvain (France).

EEAA 2019. "Wadi El Gemal – Hamata Protected Area". Retrieved from the Ministry of State for Environmental Affaires, Egyptian Environmental Affairs Agency website http://www.eeaa.gov.eg/en-us/topics/nature/protectorates/protectoratesdescription.aspx. Accessed on 02 August 2019.

El Shaffai, A., Hanafy, M.H., & Gab-Alla, A.A.-F.A. 2011. Distribution, abundance and species composition of seagrasses in Wadi El Gemal National Park, Red Sea, Egypt. Indian Journal of Applied Research, 4(3): 1-9.

Fumagalli, M. 2016. Conservation of the spinner dolphin in the Egyptian Red Sea (Doctoral dissertation). University of Otago (New Zealand). https://ourarchive.otago.ac.nz/handle/10523/6767.

Fumagalli, M. 2008. Socio-ecologia di *Stenella longirostris* nel Mar Rosso egiziano (M.Sc. dissertation). Unversità degli Studi di Milano (Italy).

Fumagalli, M., Cesario, A., & Costa, M. 2019. Where dolphins sleep: resting areas in the Red Sea. In Rasul, N.M.A. and Stewart, I.C.F. (Eds.), Oceanographic and Biological Aspects of the Red Sea, pp. 305–326. Cham: Springer International Publishing.

Fumagalli, M., Cesario, A., Costa, M., Harraway, J., Notarbartolo Di Sciara, G., & Slooten, E. 2018. Behavioural responses of spinner dolphins to human interactions. Royal Society Open Science, 5(4): 172044.

Fumagalli, M., Cesario, A., Costa, M., Notarbartolo Di Sciara, G., Harraway, J., Slooten, E. 2019. Population ecology and the management of whalewatching operations on a data-deficient dolphin population. Ecology and Evolution. 9:10442-10456 doi:10.1002/ece3.5565

Halpin, P.N., Read, A.J., Fujioka, E., Best, B.D., Donnelly, B., Hazen, L.J., Kot, C., Urian, K., LaBrecque, E., Dimatteo, A., Cleary, J., Good, C., Crowder, L.B., & Hyrenbach K.D. 2009. OBIS-SEAMAP: The world data center for marine mammal, sea bird, and sea turtle distributions. Oceanography, 22(2): 104–115.

Hanafy M., Gheny M.A., Rouphael A.B., Salam A., Fouda M. 2006. The dugong, *Dugong dugon*, in Egyptian waters: distribution, relative abundance and threats. Zoology in the Middle East, 39:17-24.

Ismail M.E. 2017. Biological aspects on the populations of spinner dolphin (*Stenella longirostris*) in the southern Egyptian coast of the Red Sea. (M.Sc. dissertation). Port Said University (Egypt).

Ismail, M.E., Ahmed, M.I., Hanafy, M.H., & Madkour, F.F. (2017). Examination of genetic diversity of spinner dolphin (*Stenella longirostris*) using cox 1 at the southern Egyptian coast of the Red Sea. International Journal of Engineering Science and Computing, 14801.

Marsh, H., & Sobtzick, S. 2015. *Dugong dugon*. The IUCN Red List of Threatened Species 2015: e. T6909A43792211. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T6909A43792211.en. Downloaded on 02 August 2019.

Nasr, D., Shawky, A.M., Vine, P. 2019. Status of Red Sea Dugongs. In Rasul, N.M.A. and Stewart, I.C.F. (Eds.), Oceanographic and Biological Aspects of the Red Sea, pp. 327–354. Cham: Springer International Publishing.

Nature Conservation Sector 2004. Management Plan for Wadi El Gemal National Park. Cairo, Egypt: Egyptian Environmental Affairs Agency.

Nicolas, A., Boudier, F., & Montigny, R. (1987). Structure of Zabargad Island and early rifting of the Red Sea. Journal of Geophysical Research: Solid Earth, 92(B1), 461-474. doi:10.1029/JB092iB01p00461

Norris, K.S., Würsig, B., Wells, R.S., & Würsig, M. 1994. The Hawaiian spinner dolphin. Berkeley and Los Angeles, USA: University of California Press.

Notarbartolo di Sciara, G., Hanafy, M.H., Fouda, M.M., Afifi, A., & Costa, M. (2009). Spinner dolphin (*Stenella longirostris*) resting habitat in Samadai Reef (Egypt , Red Sea) protected through tourism management. Journal of the Marine Biological Association of the United Kingdom, 89(1): 211–216.

Notarbartolo di Sciara G., Kerem D., Smeenk C., Rudolph P., Cesario A., Costa M., Elasar M., Feingold D., Fumagalli M., Goffman O., Hadar N., Mebrathu Y.T., Scheinin A. 2017. Cetaceans of the Red Sea. CMS Technical Series 33. Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals.

Perrin W.F. and Gilpatrick J.W.J. 1994. Spinner dolphin *Stenella longirostris* (Gray, 1828). In: Ridgway S.H., Harrison R (eds) Handbook of marine mammals: the first book of dolphins, pp. 99-128. London: Academic Press.

Ponnampalam, L.S. 2005. Spinner dolphins at Sha'ab Samadai: behaviour and interaction with snorkelers. Cetacean Society International.

Shawky, A. M., & Afifi, A. 2008. Behaviour of spinner dolphin at Sha'ab Samadai, Marsa Alam, Red Sea, Egypt. Egyptian Journal of Biology, 10: 36–41.

Shawky, A.M., Alwany, M.A., Zakaria, S., El-Etreby, S.G. 2015. Estimation of the abundance of the spinner dolphin *Stenella longirostris* using photo identification technique in Samadai Reef, Red Sea, Egypt. Catrina: The International Journal of Environmental Sciences, 10: 61–73

Shawky, A.M., Sallam, W.S., Alwany, M.A., Mohammad, D.A., Mohamed, S.Z. 2017. Photo identification of dugongs of Marsa Alam and Wadi El Gemal National Park, Egyptian coast of the Red Sea. Al Azhar Bulletin of Science, 28(2): 1-10.

Shawky, A.M., Sallam W.S., Alwany M.A., Mohammad D.A., Mohamed S.Z. 2016. Stranding of a neonatal dugong calf in Wadi El Gemal National Park: implications for dugong conservation in Egypt. Al Azhar Bulletin of Science, 27(2): 1-11.

Silva-Jr., J. M., Silva, F. J. L., & Sazima, I. 2005. Rest, nurture, sex, release, and play: diurnal underwater behaviour of the spinner dolphin at Fernando de Noronha Archipelago, SW Atlantic. Aqua, Journal of Ichthyology and Aquatic Biology, 9: 161–176.

The dataset used in Notarbartolo di Sciara et al. (2017) is available as "Red Sea Cetacean Review – Sightings" in OBIS-SEAMAP (Halpin et al., 2009).

Figure 5: A group of Indo-Pacific bottlenose dolphin (*Tursiops aduncus*). Photo: Mohamed Ismail

Acknowledgements

We would like to thank 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.

Suggested Citation: IUCN-Marine Mammal Protected Areas Task Force, 2021. Southern Egyptian Red Sea Bays, Offshore Reefs and Islands IMMA Factsheet. https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/ WesternIndianOcean/ southern-egyptian-red-sea-bays-offshore-reefs-islands-WesternIndianOcean.pdf. Downloaded on (day month year).

PDF made available for download at https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/WesternIndianOcean/ southern-egyptian-red-sea-bays-offshore-reefs-islands-WesternIndianOcean.pdf.