

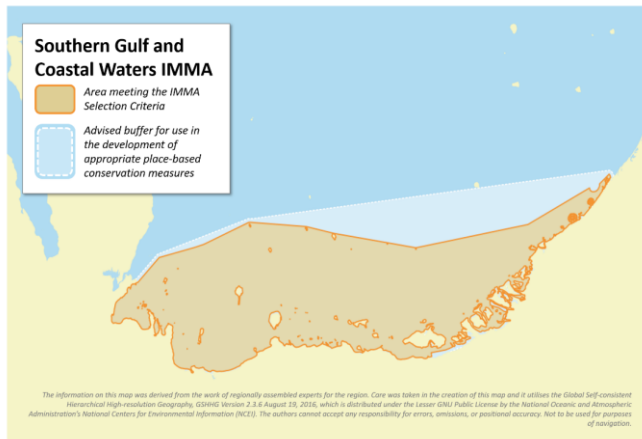
Southern Gulf and Coastal Waters IMMA

Summary

The Southern Gulf and Coastal Waters IMMA, in the southern portion of the Arabian/Persian Gulf, is characterized by varied habitats including extensive seagrass meadows, mangroves, areas of sandy and soft bottom sediments, coral reefs and numerous man-made and natural channel systems. The area includes the cities of Abu Dhabi and Dubai and various artificial islands and peninsulas. In the past 20 years it has experienced drastic impacts from human activity mainly in the form of land reclamation, overfishing and other effects of human population expansion. However, the area still supports a number of marine mammal species, including the world's second-largest Vulnerable dugong (*Dugong dugon*) population, and approximately 700 Endangered Indian Ocean humpback dolphins (*Sousa plumbea*). Long term monitoring of these species using systematic aerial and vessel-based surveys has found high concentrations of dugongs in the Marawah Marine Biosphere Reserve and the Al-Yasat Marine Protected Area. Recent surveys have also documented the regular presence of Vulnerable Indo-Pacific finless porpoises (*Neophocaena phocaenoides*) and Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) in the area. The ongoing anthropogenic pressures in this rapidly developing region raise concerns for the continued survival of these species in this IMMA.

Criterion A: Species or Population Vulnerability

The Gulf region constitutes an enclosed body of shallow water with an average depth of 35 m connected with the Indian Ocean only through the narrow Strait of Hormuz (Sheppard et al., 2010). It is regarded as being one of the most fragile and vulnerable marine ecosystems in the world (WCMC, 1991) and has been subjected to drastic changes in the past 30 years (Sheppard et al., 2010). The IUCN Red List of globally threatened species lists the global status of Indian Ocean humpback dolphin (*Sousa plumbea*) as "EN" (Endangered) (Braulik et al.,



Area Size

26,149 km²

Qualifying Species and Criteria

Indian Ocean humpback dolphin – *Sousa plumbea*

Criteria A, B2, C1, C2

Indo-Pacific finless porpoise – *Neophocaena phocaenoides*

Criteria A, C1, C2

Dugong – *Dugong dugon*

Criteria A, B2, C1, C2

Indo-Pacific bottlenose dolphin – *Tursiops aduncus*

Criteria C1, C2

Other Marine Mammal Species Documented

Balaenoptera edeni, *Kogia sima*, *Megaptera novaeangliae*, *Orcinus orca*

2017) whilst the dugong (*Dugong dugon*) and Indo-Pacific finless porpoise (*Neophocaena phocaenoides*) are both listed as "VU" (Vulnerable) species to extinction (Marsh and Sobotzick, 2015; Wang and Reeves, 2017).



Figure 1: Indian Ocean humpback dolphin (*Sousa plumbea*) in the Marawah Marine Biosphere Reserve (Abu Dhabi, UAE). Photo: Bruno Díaz López/BDRI 2017

Criterion B: Distribution and Abundance

Sub-criterion B2: Aggregations

The extensive seagrass meadows in the area support important concentrations of dugongs year-round (Preen, 2004; Das, 2014). Aerial surveys estimated an abundance of 2,682 (\pm 346) dugongs inhabiting mainly Abu Dhabi Central and Western regions placing this as the second largest dugong population in the world after Australia (Marsh et al., 2002; Preen, 2004; EAD, 2015). The Marawah Marine Biosphere Reserve supports the highest density of dugongs in the area, followed by Al-Yasat marine protected area. Most of the dugongs occurred in smaller groups, yet aggregations up to 300 individuals are not uncommon. Significant dugong aggregations are also known to occur in adjacent waters of Qatar and Bahrain and connectivity between these winter aggregations is plausible. Recent (2014-2015) boat-based surveys that covered the waters of the Abu Dhabi Emirate estimated a population of 701 (95% CI = 473 to 845) individual Indian Ocean humpback dolphins, the largest population estimate of this species in reported literature (Grandcourt et al., 2015, 2016; Díaz López and Methion, 2016; EAD 2016; Díaz López et al., 2017).

Criterion C: Key Life Cycle Activities

Sub-criterion C1: Reproductive Areas

Survey data confirm that the IMMA contains important habitat for Indian Ocean humpback dolphins, dugongs, Indo-pacific finless porpoises and Indo-pacific bottlenose dolphins to mate, give birth, and/or care for young until weaning (EAD, 2015; EAD, 2016; Díaz López et al., 2017; Grandcourt et al., 2017). Overall, 26% of the individuals in each group of Indian Ocean humpback dolphins, 27% of Indo-Pacific bottlenose dolphins, and 22% of Indo-Pacific finless porpoise are newborn or dependent calves (< 2 yrs. old), (Díaz López & Methion, 2016 and 2018). The number of Indo-Pacific bottlenose dolphin calves increased significantly during the winter season (Díaz López & Methion, 2018). During boat-based surveys carried out in 2017, the research team observed a female Indo-Pacific bottlenose dolphin giving birth in the waters within the Marawah Marine Biosphere Reserve. Satellite telemetry of dugongs in the IMMA suggests that dugongs are resident in these waters and do not move over large distances (EAD, 2012). During aerial and boat-based surveys, it has been confirmed that dugongs breed in the shallow coastal waters of Abu Dhabi (Das et al., 2018). Many groups included mother-calf pairs (8.2% to 20.6%) (Preen, 1989; Preen, 2004; Das et al., 2015; Das et al., 2018). Recent drone footage documented a mother with two calves, further confirming earlier aerial observations that twin births occur in this population (Das et al., 2015).

Criterion C: Key Life Cycle Activities

Sub-criterion C2: Feeding Areas

The coastal waters of the Southern Gulf have an estimated seagrass cover of greater than 5600 km², with a depth gradient up to 15 m (Phillips et al., 2003; Erftemeijer and Shuail, 2012; Al Dhaheri, 2017). The seagrass meadows are critical foraging areas for dugongs as confirmed by visual observations from aerial and boat-based surveys (Das, 2005; Díaz López, et al., 2017; Díaz López and Methion, 2016, 2018). These also include narrow inshore channels, mangrove areas, and open sandy and shallow coastal waters as an important foraging habitat for Indian Ocean humpback dolphins, Indo-pacific bottlenose dolphins,

and finless porpoises (Díaz López and Methion, 2016, 2018; EAD 2016; Díaz López et al., 2017).

Within the coastal waters of Dubai, both boat-based surveys and occasional sighting data reported all three cetacean species actively feeding in the area. Indo-Pacific bottlenose dolphins have been directly observed feeding on cephalopods and following shoals of barracuda and kingfish. Preliminary studies on stomach contents show that a number of species identified as prey are common commercial species targeted by the local fishery industry. This raises concern as a recent regional study reported over 80% decline of the local fish stock of the major commercial species.

Supporting Information

Al Dhaheri, S., Javed, S., Alzahlawi, N., Binkulaib, R., Cowie, W., Grandcourt, E. and Kabshawi, M. 2017. Abu Dhabi Emirate Habitat Classification and Protection Guideline. Environment Agency Abu-Dhabi. Pages - 76

Baldwin, R.M., Collins, M., Van Waerebeek, K. and Minton, G., 2004. The Indo-Pacific humpback dolphin of the Arabian region: a status review. *Aquatic Mammals*, 30(1), pp.111-124.

Braulik, G.T., Findlay, K., Cerchio, S., Baldwin, R. and Preen, W., 2017. *Sousa plumbea*. The IUCN Red List of Threatened Species 2017: e. T82031633A82031644.

Burt, J.A. 2014. The environmental costs of coastal urbanization in the Arabian Gulf. *City*. 18(6):760-770. <https://doi.org/10.1080/13604813.2014.962889>

Dakhteh S.M.H., Ranjbar S., Moazeni M., Mohsenian N., Delshab H., Moshiri H., Nabavi S. M. B., Van Waerebeek K., 2017. *J Mar Biol Oceanogr*. 6:3.

Das, H. 2005. Status of Dugongs in Abu Dhabi. In: "Marine Environment and Resources of Abu Dhabi" Edt. By Thabit Zahran Al Abdessalaam. Chapter 11. Pp184-199. Environment Agency Abu Dhabi, UAE. Motivate Publishing.

Das, H. S., Al Hameli, M., Al Ameri, H., Bulga, I., Abdulla, M., and Grandcourt, E. 2015. Aerial Survey of Marine Wildlife 2015. Monitoring of Marine Endangered Species Project. Marine Division. TMBS. EAD. p. 16.



Figure 2: Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) in front of the city of Abu Dhabi, UAE. Photo: Bruno Díaz López/BDR1 2017.

Das, H. S., Al Hameli, M., Bulga, I., Al Ameri, H., and Kwan, D. 2018. Aerial Survey of Marine Wildlife 2018. Technical Report, Monitoring of Marine Endangered Species Project. Marine Division. TMBS. EAD. p. 25.

Das, H. S., Al Hameli, M., Bulga, I., Al-Mansoori, A., Al Ameri, H. and Kwan, D. 2019. Investigation of Mortality of Dugongs in Abu Dhabi Waters (2009-2018). Marine Assessment and Conservation Section. Marine Division. TMBS. EAD. p. 22.

Díaz López B. and Methion, S., 2016. Abundance estimate, distribution and use of habitat of dolphin species in Abu Dhabi waters 2014-2016. Marine Division. TMBS. EAD. 120 p.

Díaz López B. and Methion, S., 2018. Distribution, use of habitat and group dynamics of cetacean species in Abu Dhabi waters, April 2017 Surveys. Dolphins Project. Marine Division. TMBS. EAD. 20 p.

Díaz López, B., Grandcourt, E., Methion, S., Das, H., Bugla, I., Al Hameli, M., Al Ameri, H., Abdulla, M., Al Blooshi, A., & Al Dhaheri, S. 2017. The distribution, abundance and group dynamics of Indian Ocean humpback dolphins (*Sousa plumbea*) in the Emirate of Abu Dhabi (UAE). *Journal of the Marine Biological Association of the United Kingdom*, 98(5), 1119-1127.



Figure 3: A group of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) in Abu Dhabi, UAE. Photo: Bruno Díaz López/BDRI 2017

EAD, 2012. Movement of Dugongs in Abu Dhabi waters. Result of satellite tagging program 2008 and 2012. Marine Assessment and Conservation section, Environmental Agency Abu Dhabi, UAE. Pages – 12.

EAD, 2015. Dugong Conservation. Biodiversity Annual Report 2014, Environmental Agency Abu Dhabi, UAE. Pages – 20.

EAD, 2016. Status of Dolphins of Abu Dhabi Waters. Biodiversity Report of Environmental Agency Abu Dhabi, UAE. Pages – 16.

Erftemeijer, P.L.A. and Shuail, D.A. 2012. Seagrass habitats in the Arabian Gulf: Distribution, tolerance thresholds and threats. *Aquatic Health System Health and Management* 15: 73-83.

Grandcourt, E., Díaz López, B, Das, H., Bugla, I., Al Hameli, M., Al Ameri, H., Abdulla, M. 2015. Dolphin surveys in the world's most extreme marine environment. Poster presented at Biennial Conference on the Biology of Marine Mammals – International Society for Marine Mammalogy. San Francisco, USA. December 2015.

Grandcourt, E., Díaz López, B., Methion, S., Das, H., Bugla, I., Al Hameli M., Al Mansoori A., Al Ameri H., and Al Dhaheri, S., 2017. Poster presented at Biennial Conference on the Biology of Marine Mammals – International Society for Marine Mammalogy. Halifax, Canada. October 2017.

Hoolihan, J.P., Premanandh, J., D'Aloia-Palmieri, M.A. and Benzie, J.A.H., 2004. Intraspecific phylogeographic isolation of Arabian Gulf sailfish *Istiophorus platypterus* inferred from mitochondrial DNA. *Marine Biology*, 145(3), pp.465-475. <https://www.ramsar.org/news/united-arab-emirates-designates-jabal-ali-wetland-sanctuary>

Hoolihan, J.P., Premanandh, J., D'Aloia-Palmieri, M.A. and Benzie, J.A.H., 2004. Intraspecific phylogeographic isolation of Arabian Gulf sailfish *Istiophorus platypterus* inferred from mitochondrial DNA. *Marine Biology*, 145(3), pp.465-475. <https://www.ramsar.org/news/united-arab-emirates-designates-jabal-ali-wetland-sanctuary>

López, B.D., Grandcourt, E., Methion, S., Das, H., Bugla, I., Al Hameli, M., Al Ameri, H., Abdulla, M., Al Blooshi, A. and Al Dhaheri, S., 2018. The distribution, abundance and group dynamics of Indian Ocean humpback dolphins (*Sousa plumbea*) in the Emirate of Abu Dhabi (UAE). *Journal of the Marine Biological Association of the United Kingdom*, 98(5), pp. 1119-1127.

Marsh, H. & Soltzick, 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>.

Marsh, H., Penrose, H., Eros, C., and Huges, J. 2002. Dugong Status Report and Action Plans for Countries and Territories. UNEP Early Warning Assessment Report Series, UNEP/DEWA/RS.02-1
Phillips, R.C., Roughland, R. A. and Ypussef, A. Seagrasses of Abu Dhabi UAE. *Tribulus*, 12.1. Pp 20-23. *Journal of Emirates natural History Group*. Abu Dhabi, UAE.

Preen, A., 2004. Distribution, abundance and conservation status of dugongs and dolphins in the southern and western Arabian Gulf. *Biological Conservation*, 118(2), pp.205-218.

Sheppard, C., Al-Husiani, M., Al-Jamali, F., Al-Yamani, F., Baldwin, R., Bishop, J., Benzoni, F., Dutrieux, E., Dulvy, N.K., Durvasula, S.R.V. and Jones, D.A., 2010. The Gulf: a young sea in decline. *Marine Pollution Bulletin*, 60(1), pp.13-38. Evaluation (pp. 1-23). Academic Press

Sheppard, C.R., 1993. Physical environment of the Gulf relevant to marine pollution: an overview. *Marine Pollution Bulletin*, 27, pp.3-8.

Sheppard, Charles, Mohsen Al-Husiani, Fahad Al-Jamali, Faiza Al-Yamani, Rob Baldwin, James Bishop, Francesca Benzoni et al., 2010. "The Gulf: a young sea in decline." *Marine Pollution Bulletin* 60, no. 1: 13-38.

Smith, E.G., Hume, B.C., Delaney, P., Wiedenmann, J. and Burt, J.A., 2017. Genetic structure of coral-*Symbiodinium symbioses* on the world's warmest reefs. *PLoS one*, 12(6), p.e0180169.

Vaughan, G.O., Al-Mansoori, N. and Burt, J.A., 2019. The Arabian Gulf. In *World Seas: an Environmental Wabnitz, C.C., Lam, V.W., Reygondeau, G., Teh, L.C., Al-Abdulrazzak, D., Khalfallah, M., Pauly, D., Palomares, M.L.D., Zeller, D. and Cheung, W.W., 2018. Climate change impacts on marine biodiversity, fisheries and society in the Arabian Gulf. PLoS one*, 13(5), p.e0194537.

Wang, J.Y. & Reeves, R. 2017. *Neophocaena phocaenoides*. The IUCN Red List of Threatened Species 2017: e.T198920A50386795. <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T198920A50386795.en>.

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.



**MARINE MAMMAL
PROTECTED AREAS
TASK FORCE**



IMMA

Supported by:



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



based on a decision of the German Bundestag

Suggested Citation: IUCN-Marine Mammal Protected Areas Task Force, 2021. Southern Gulf and Coastal Waters IMMA Factsheet. <https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/WesternIndianOcean/southern-gulf-coastal-waters-WesternIndianOcean.pdf>. Downloaded on (day month year).

PDF made available for download at <https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/WesternIndianOcean/southern-gulf-coastal-waters-WesternIndianOcean.pdf>