

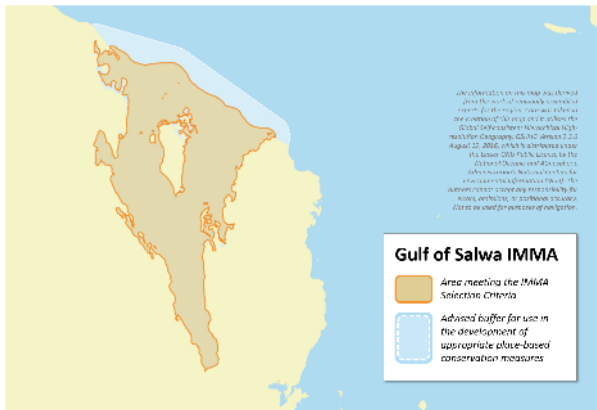
# Gulf of Salwa IMMA

## Description

The Gulf of Salwa IMMA includes the territorial waters of Qatar and Bahrain in the Gulf of Salwa in the southern Arabian Gulf. It includes the west coast of Qatar, south of the 10m isobath. The IMMA comprises a small part of a larger portion of the southern and western side of Arabian Gulf stretching between the UAE and the southern border of Kuwait where marine mammal aerial surveys were conducted in the winter of 1985/1986. The surveys formed the basis for further surveys across the area in 1999 (Preen, 2004), and later in the waters of Bahrain (Hodgson, 2009) and Qatar (Marshall et al, 2018). Water flow in and out of the Gulf of Salwa is partially constricted due to a reef complex stretching across its northern end between Bahrain almost to Qatar with a water depth <10m. Tidal ranges which are 1.2 m to the north of Bahrain are reduced to 0.5 m in the south of the Gulf of Salwa, and the tidal phase lags considerably (Sheppard et al,1993).

Regularly occurring species in the area include the dugong (*Dugong dugon*), Indo-Pacific humpback dolphin (*Sousa plumbea*) and the Indian Ocean bottlenose dolphin (*Tursiops aduncus*) (Preen 1995, Baldwin et al., 1999; Hodgson, 2009). There are also confirmed records of the finless porpoise (*Neophocaena phocaenoides*) (Baldwin et al, 1999; Preen, 2004) within the Gulf of Salwa but the species is uncommon. Bryde's whales (*Balaenoptera edeni*) are only known in the Gulf of Salwa from strandings and are considered rare (Robineau and Fiquet, 1996).

Aerial surveys were conducted in the winter of 1985 and the summers of 1986, 1999, and 2006 (Preen, 2004; Hodgson, 2009). During these surveys dugongs were most abundant in the north east of the Gulf of Salwa within a triangular shaped area between the main island of Bahrain, Fasht Adhm in Qatar and south towards the Hawar Islands. This resulted in the proposal for the area to form one of three protected areas for the dugongs within the Arabian/Persian Gulf. Surveys from 5–6 March 1986 between Bahrain and Qatar documented the largest single dugong group ever observed (n=674) (Preen 1995; Preen, 2004; Marsh et al., 2002).



## Area Size

10,676 km<sup>2</sup>

## Qualifying Species and Criteria

Dugong – *Dugong dugon*

Criteria A, B2, C1, C2

## Other Marine Mammal Species Documented

*Balaenoptera edeni*, *Delphinus delphis tropicalis*,  
*Dugong dugon*, *Neophocaena phocaenoides*,  
*Orcinus orca*, *Sousa plumbea*, *Tursiops aduncus*

## Summary

The Gulf of Salwa covers the territorial waters of both Bahrain and Qatar. The area is characterized by shallow water habitats with extensive seagrass meadows, and is recognized as a globally important area for the world's second largest population of dugongs (*Dugong dugon*). Dugongs, listed as Vulnerable on the Red List, have been documented feeding in this unique habitat. The Gulf of Salwa is partially constricted at its northern end by a reef complex that stretches from Bahrain towards Qatar. Depths within the gulf are generally <10m, with tidal ranges varying from 1.2 m to the north of Bahrain to only 0.5 m in the south of the Gulf of Salwa. Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) and Endangered Indian Ocean humpback dolphins (*Sousa plumbea*) are also reported from the area, while Vulnerable finless porpoises (*Neophocaena phocaenoides*) are only rarely sighted.

Fishermen interviewed from Bahrain indicated dugongs are known to form large groups in this area during winter months (Preen, 1989). In contrast to the winter survey, the summer survey of 1986 resulted in a broader distribution of dugongs through the survey area with more sightings of dugongs but smaller group sizes (Fig. 1). These early surveys also noted other high-density areas for dugongs existing between Saudi Arabia and Bahrain, south of the Saudi Arabia-Bahrain Causeway and north of Uqair in Saudi Arabia. Although the work conducted between 1985 and 1986 by Preen is almost 35 years old, results from more recent surveys demonstrate that the area of the Gulf of Salwa is still important for dugongs and bottlenose dolphins (Hodgson, 2009).

Other marine mammal species have been rarely sighted in the IMMA. Killer whales (*Orcinus orca*) were sighted off Bahrain in January 2004 (Jassim Al Qaseer, pers. comm.) with Indo-Pacific common dolphins also reported close to the island (M. Hill, pers. comm.) as reported by Hodgson (2009). Studies conducted approximately 100km away from this IMMA in the Jubail area of Saudi Arabia between 1992 and 1994 indicated consistent presence of common dolphins

with group sizes between 2 and 60 individuals (Robineau and Fiquet, 1996). In May 1995 a Bryde's whale (*Baleanoptera edeni*) stranded at the Bahrain end of the Saudi – Bahrain causeway; this event, together with a stranding of the same species off Abu Ali Island, Saudi Arabia (March 1995) and the sighting of two foraging individuals off Jana Island in May 1993 led Robineau and Fiquet (1996) to suggest that the species could be a regular visitor to the area.

### Criterion A: Species or Population Vulnerability

The dugong (*Dugong dugong*) is listed as Vulnerable according to the IUCN Red List (Marsh and Sobtzick, 2015) with a decreasing population trend. The status assessment is based on a global review of the species although within this review information from the Gulf is considered as 'Data Deficient'. However, studies in Bahrain in 2006 (Hodgson, 2009), produced population estimates of Dugongs within these waters equivalent to those encountered 20 years previously by Preen (2004).

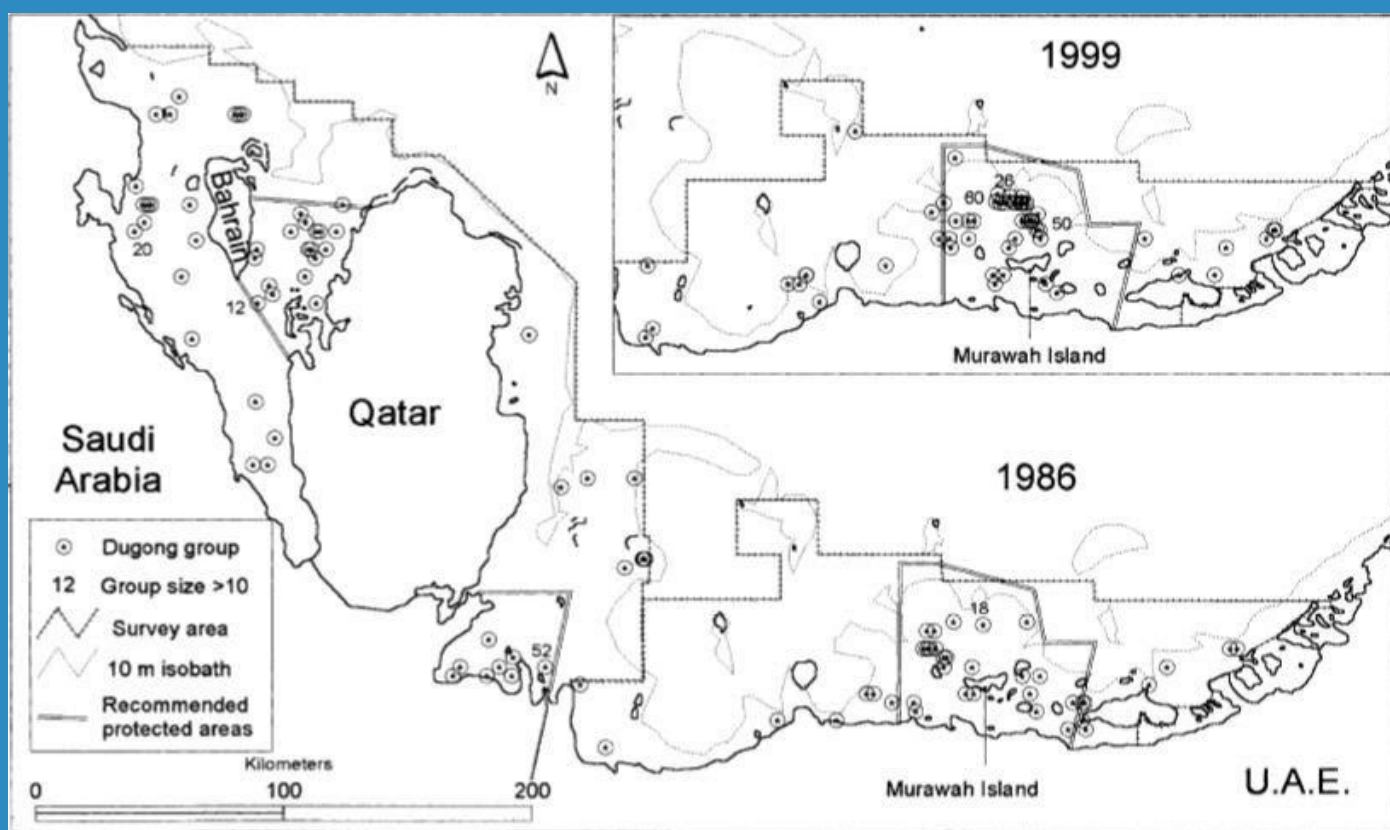


Figure 1. Locations of dugong groups recorded during strip-transect aerial surveys of the southern Arabian Gulf during the summers of 1986 and 1999. Sizes of groups are indicated. From Preen, 2004.



Figure 2: An Indian Ocean humpback dolphin (*Sousa plumbea*) in the Gulf of Salwa. Photo: Premlal Panickan

## Criterion B: Distribution and Abundance

### Sub-criterion B2: Aggregations

During Preen's (1995) summer survey, dugongs were mainly sighted as single individuals. By contrast, during winter months, two large groups in close proximity composed of 577 and 97 dugongs were sighted between Bahrain and Qatar (Preen, 2004). Very few dugongs were recorded outside of these two groups. The survey results corresponded with information obtained from interviews with fishers who also reported that dugongs tended to aggregate in large herds in winter. Large aggregations of >50 animals were also reported in 2005 from the same area (Hodgson, 2009), and marine mammal surveys off the west coast of Qatar in January to March and December of 2015 came across a large aggregation of Dugongs (n=508) (Marshall et al. 2018) equivalent to the large aggregation (n=674) observed by Preen in March of 1986 (Preen, 2004).

## Criterion C: Key Life Cycle Activities

### Sub-criterion C1: Reproductive Areas

The presence of dugong cow-calf pairs were reported in both the Preen (2004) and Marshall et al. (2018) surveys. Preen (2004) reports calves making up 15.7% (SE 0.5%) of a single large herd of 674 animals calculated from a series of 5 close-up photos taken close to the maritime boundary between Bahrain and Qatar in March 1986. Marshall et al. (2018) documented a count of 508 animals within an area of <1 km<sup>2</sup> from vessels surveys assisted using UAV to produce aerial imagery of the herd. Analysis of the imagery revealed that cow-calf pairs comprised 9.9% of the group.

## Criterion C: Key Life Cycle Activities

### Sub-criterion C2: Feeding Areas

Large aggregations of foraging dugongs have been reported (Marshall et al., 2018). Underwater observations confirmed animals feeding in seagrass meadows (comprised of *Halodule univernis* and *Halophila ovalis*) during vessel surveys conducted off northwest Qatar (Marshall et al., 2018). Two separate herds (n=226 and n=166) of foraging dugongs were also observed during two separate helicopter surveys of northwest Qatari waters in early December 2015. Foraging behaviour was detected based on the surfacing intervals of animals, and on observed plumes of sediment trails.

## Supporting Information

Al-Abdulrazzak, D. and Pauly, D., 2017. Reconstructing historical baselines for the Persian/Arabian Gulf Dugong, *Dugong dugon* (Mammalia: Sirena). *Zoology in the Middle East*, 63(2), pp.95-102.

Baldwin, R.M., Gallagher, M.D. and Van Waerebeek, K. 1999. A review of cetaceans from waters off the Arabian Peninsula. In: *Oman's Natural History*, eds. Fisher, M., Spalton, A. and Gazanfar, S., Backhuys Publishers, Leiden. Pp. 161-189.

Baldwin, R. M. 2003. *Whales and Dolphin of Arabia*. Mazoon Printing Press, Muscat, Sultanate of Oman. Pp 111

Baldwin R.M. 2005. *Marine Life of Arabian Seas*. Seawords Publishing, Noordhoek, South Africa. Pp 210

Bell, I. 2001. A preliminary assessment of the turtle and dugong population of Bahrain and Hawar Islands. Manama, Bahrain: Unpublished internal report for the Ministry of Housing.

Braulik, G.T., Ranjbar, S., Owfi, F., Aminrad, T., Dakhteh, S.M.H., Kamrani, E. and Mohsenizadeh, F., 2010. Marine mammal records from Iran. *Journal of Cetacean Research and Management*, 11(1), pp.49-63.

Braulik, G.T., Findlay, K., Cerchio, S., Baldwin, R. & Perrin, W. 2017. *Sousa plumbea*. The IUCN Red List of Threatened Species 2017: e.T82031633A82031644. <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T82031633A82031644.en>. Downloaded on 31 Aug. 2019. 91-101.

Collins, T., Preen, A., Willson, A., Braulik, G., Baldwin, R.M. 2005. Finless Porpoise (*Neophocaena phocaenoides*) in the waters of Arabia, Iran and Pakistan. Submitted paper to the International Whaling Commission Scientific Committee 2005. SC/57/SM6.

Cope, R.C., Pollett, P.K., Lanyon, J.M. and Seddon, J.M. 2015. Indirect detection of genetic dispersal (movement and breeding events) through pedigree analysis of dugong populations in southern Queensland, Australia. *Biological Conservation* 181:

Gallagher, M. D. 1991. Collection of skulls of cetacea: Odontoceti from Bahrain, United Arab Emirates and Oman, 1969 – 1990 Pages 89-97 in S. Leatherwood, and G. P. Donovan, editors. *Cetaceans and Cetacean Research in the Indian Ocean Sanctuary: Marine Mammal Technical Report Number 3*. UNEP, Nairobi, Kenya.

Hodgson, A. J. 2009. 'Marine Mammals'. In *Marine Atlas of Bahrain*. Ed R. Loughland pp233 – 261. GEOMATEC Bahrain Centre for Studies and Research.

Keijl, G.O. and Have, T.M.V.D., 2002. Observations on marine mammals in southern Iran, January 2000. *Zoology in the Middle East*, 26(1), pp.37-40.

Marsh, H. and 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 31 August 2019.

Marshall, C.D., Al Ansi, M., Dupont, J., Warren, C., Al Shaikh, I. and Cullen, J., 2018. Large dugong (*Dugong dugon*) aggregations persist in coastal Qatar. *Marine Mammal Science*, 34(4), pp.1154-1163.

Nithyanandan, M., 2010. Opportunistic sightings of Indo-Pacific humpback dolphin, *Sousa chinensis* from Kuwait waters with notes on their behaviour. *J. of the Marine Biological Association of India*, 52(1), pp.19-23.

Preen, A., 1995. Impacts of dugong foraging on seagrass habitats: observational and experimental evidence for cultivation grazing. *Marine Ecology Progress Series*, 124, pp.201-213.

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

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

Sheppard, J., Preen, A.R., Marsh, H., Lawler, I.R., Whiting, S. and Jones, R.E. 2006. Movement heterogeneity of dugongs, *Dugong dugon* (Müller) over large spatial scales. *Journal of Experimental Marine Biology & Ecology* 334: 64–83.

## 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. Gulf of Salwa IMMA Factsheet. <https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/WesternIndianOcean/gulf-salwa-WesternIndianOcean.pdf>. Downloaded on (day month year).

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