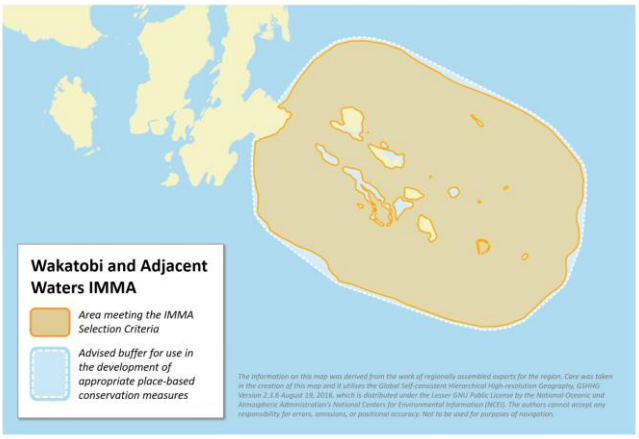

Area Size

26 815 km²

Qualifying Species and Criteria

Sperm whale – *Physeter macrocephalus*

Criterion A; C (2)

Spinner dolphin – *Stenella longirostris*

Criterion B (2); C (2)

Marine Mammal Diversity

Criterion D (2)

Balaenoptera musculus, Ziphius cavirostris, Peponocephala electra, Tursiops truncatus, Grampus griseus, Stenella attenuata, Stenella longirostris, Physeter macrocephalus, Balaenoptera edeni, Globicephala macrorhynchus, Tursiops aduncus

Summary

The Wakatobi IMMA is situated between the Banda and Flores Seas, southeast Sulawesi and is one of Indonesia's marine national parks. Wakatobi and its adjacent waters are formed of the four main Tukangbesi Islands in the archipelago including Wangi-wangi, Kaledupa, Tomia, and Binongko (Wa-ka-to-bi). This area is characterised by a highly variable submerged landscapes and channels between major islands that act as habitat for sperm whales (*Physeter macrocephalus*). This area is also an important

Wakatobi and Adjacent Waters IMMA

Summary, continued.

habitat for spinner dolphins (*Stenella longirostris*), of which a significant number of individuals have been observed across multiple years of study. A concentration of both species occurs here and their habitat use has been confirmed via spatial modelling studies of their habitats. The area contains an important diversity of cetacean species; at least 11 marine mammal species have been observed utilising the area of Wakatobi and its adjacent waters.

Description

Wakatobi and its adjacent waters cover an area of 40,575.6 square km. The Wakatobi area is situated between the Banda and Flores Seas, southeast Sulawesi, Indonesia. As part of the Banda Sea Ecoregion and Southeast Sulawesi Seascape, the IMMA has a high marine biodiversity and is the second highest priority site of marine conservation in the region (Green and Mous, 2008; Huffard et al., 2012; Pet-Soede and Erdmann, 2003). The Wakatobi National Park (NP) is the second largest marine NP in Indonesia, covering an area of 1.39 million hectares and consisting of four main islands that lie in a south-easterly direction. It is well known as a conservation hotspot hosting high diversity of corals and fishes (Pet-Soede and Erdmann, 2003), as well as important habitat for seagrass, mangroves (Wakatobi NP, 2008) and seabirds (Sahri et al., 2014a). There are two big atolls to the southwest of the islands; two other small atolls and several patch reefs spread across the east of four main islands. The area also has submerged canyons and channels between major landmasses as well as oceanographic conditions that serve as important habitat for migrating marine mammals

(Pet-Soede and Erdmann, 2003). In 2012, Wakatobi was declared a World Biosphere Reserve.

Opportunistic boat-based surveys have been carried out in Wakatobi waters from 2004 to 2012. These surveys have shown that the waters support a high diversity of cetaceans. Sperm whales are most abundant in the north of Wangi-wangi island (Sahri et al., 2014b) where the slope drops off and seamount-like features are found. It is believed that there is upwelling in this location as the seascape forces nutrient circulation thereby providing more prey. Sperm whales are also found in the channels between the main islands and outer reefs.

In the east part of this area adjoining the wider Banda Sea, blue whales (Endangered species) reach the migration in the Banda Sea (Double at al., 2014). The channels between major landmasses in this area serve as passageways for migrating cetaceans (Pet-Soede and Erdmann, 2003) from the Indian Ocean. At least 11 species of whale and dolphin occur in Wakatobi (Sahri et al., 2014b), a third of the total of 33 species of cetaceans found in Indonesia (Rudolph et al., 1997; Mustika et al., 2015).

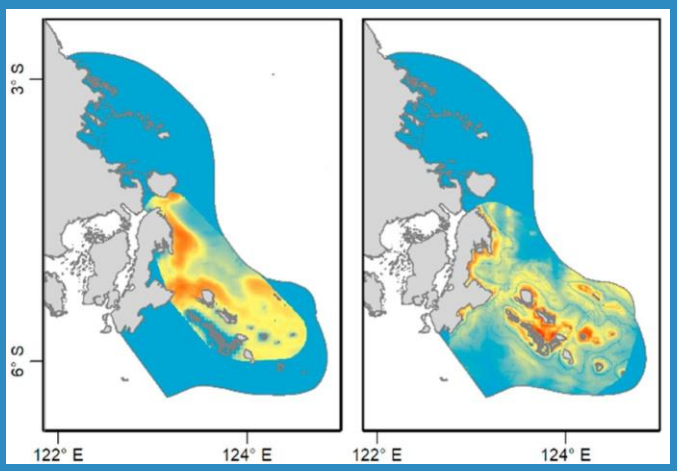

Figure 1: Habitat suitability map of sperm whale (left) and spinner dolphin (right) in Wakatobi and adjacent waters. Habitat Suitability Index ranges from 0 (blue) to 1 (red). (from Sahri et al., 2021).

Criterion A: Species or Population Vulnerability

The Sperm whale is assessed as Vulnerable A1d (Taylor et al., 2008) on the IUCN Red List, and was targeted in historical whaling in Indonesia (Sahri et al., 2020b). In Wakatobi, the sperm whale is commonly found in the northern part of the Wangi-Wangi Islands and east part of Wakatobi waters where deep channels pass between landmasses (Sahri et al., 2020c). Besides occupying the deep channels of Wakatobi, the species also tend to avoid shallow reefs (Sahri et al., 2021). The Indonesian government has classed sperm whales, along with all marine mammals, as a fully protected species (Government of The Republic of Indonesia, 1999; Sahri et al., 2020a).

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

According to monitoring data from 2006-2012 in the region (Sahri et al., 2020c), large aggregations of >100 individual bottlenose dolphins and spinner dolphins were frequently recorded in the area. Distribution of sightings indicate that bottlenose dolphins and spinner dolphins regularly utilize all parts of Wakatobi waters. This further indicates that Wakatobi waters and the habitats therein function to aggregate the species into groups of significant numbers.

Criterion C: Key Life Cycle Activities Sub-Criterion C2: Feeding Areas

The Wakatobi IMMA has highly variable submerged landscapes with drop-offs and channels between major islands. Sperm whales are most abundant in the north of Wangi-Wangi Island (Sahri et al., 2014;

Figure 2: A pod of sperm whales, *Physeter macrocephalus*, in Wakatobi waters. Photo: Robert Delfs

Sahri et al., 2020c) where the slope edges and drop-offs are located. Upwelling points that force nutrient circulation, greater productivity and aggregate prey, create a very good habitat for this squid-eating deep-diving species. From Maxent habitat modelling, the distribution of sperm whales in Wakatobi was determined by chlorophyl concentration in the area (Sahri et al., 2021). Oceanographic features (e.g. upwelling current, bathymetric slopes, thermal fronts and mesoscale eddies) support high-densities of prey. Feeding behaviour has also been observed for spinner dolphins in this area. This was validated by direct observation of this species actively feeding at the surface on schooling baby skipjack tuna and anchovies. Many sightings of dolphins associated with seabird aggregations, and feeding or foraging in this area have been documented (Sahri et al., 2020c).

Criterion D: Special Attributes
Sub-criterion D2: Diversity

The waters of Wakatobi are an important habitat for cetaceans and one of the most productive areas in the Banda Sea region, attracting a diversity of cetaceans. At least eleven common and also other rare whale and dolphin species can be observed in the area (Sahri et al. 2014; Sahri et al., 2020c), which account for a third of the total of 33 species of cetaceans found in Indonesia (Mustika et al., 2015). In addition to sperm whales, blue whales (*Balaenoptera musculus*) which are listed as Endangered on the Red List occur (Reilly et al., 2008). Short-finned pilot whale (*Globicephala macrorhynchus*), Indo-Pacific bottlenose dolphin (*Tursiops aduncus*), Cuvier's beaked whale (*Ziphius cavirostris*), spinner dolphin

(*Stenella longirostris*), melon-headed whale (*Peponocephala electra*), common bottlenose dolphin (*Tursiops truncatus*), Risso's dolphin (*Grampus griseus*), pantropical spotted dolphin (*Stenella attenuata*), and Bryde's whale (*Balaenoptera edeni*) are all recorded.

Supporting Information

Double, M.C., Andrews-Goff, V., Jenner, K.C.S., Jenner, M.N., Laverick, S.M., Branch, T.A., and Gales, N.J. 2014. Migratory Movements of Pygmy Blue Whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as Revealed by Satellite Telemetry. PLoS ONE 9(4): 1-11. [online]. Available at: https://doi.org/10.1371/journal.pone.0093578

Government of The Republic of Indonesia. 1999. Peraturan Pemerintah No. 7 Tahun 1999 tentang Pengawetan Jenis Tumbuhan dan Satwa (Government Regulation No. 7/1999 on Preserving Flora and Fauna Species). [Online]. Available at: http://ksdae.menlhk.go.id/assets/uploads/Lampiran-PP-Nomor-7-Tahun-1999.pdf

Green, A.L. and Mous, P.J. 2008. Delineating the Coral Triangle, its ecoregions and functional seascapes Version 5.0. Bali and Brisbane. 44 pp. Bali: The Nature Conservancy.

Huffard, C.L., Erdmann, M.V., and Gunawan, T. 2012. Geographic priorities for marine biodiversity conservation in Indonesia. Jakarta-Indonesia. 114 pp. Jakarta: Ministry of Marine Affairs and Fisheries and Marine Protected Areas Governance Program.

Mustika, P.L., D. Sadili, A. Sunuddin, D. Kreb, Sarmintohadi, I. Ramli, D. Suprapti, J. Ratha, E. Lazuardi, H. Rasdiana, Y. Miastro, R. P. Sari, S. Annisa, N. Terry, and M.M.P. Monintja. 2015. Rencana Aksi Nasional Konservasi Cetacea Indonesia Periode I: 2016-2020 (National Action Plan for Indonesia Cetacean Conservation Periods I: 2016-2020). Jakarta-Indonesia. 76 pp. Jakarta: Ministry of Marine Affairs and Fisheries of Indonesia.

Pet-Soede, L. and Erdmann, M.. 2003. Rapid Ecological Assessment Wakatobi National Park. Bali-Indonesia. 187 pp. Bali: WWF Indonesia and The Nature Conservancy.

Reilly, S.B., Bannister, J.L., Best, P.B., Brown, M., Brownell Jr., R.L., Butterworth, D.S., Clapham, P.J., Cooke, J., Donovan, G.P., Urbán, J. and Zerbini, A.N. 2008. *Balaenoptera musculus*. The IUCN Red List of Threatened Species 2008: e.T2477A9447146. [Online]. Available at: http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T2477A9447146.en

Rudolph, P., Smeenk, C., and Leatherwood, S. 1997. Preliminary checklist of cetacea in the Indonesian Archipelago and adjacent waters. Zoologische Verhandelingen, 312: 3-48. [Online]. Available at: http://www.repository.naturalis.nl/record/317830

Sahri, A., Santosa, H., and Purwanto. 2014. Sebaran Setasea Berdasarkan Pengamatan Insidental Jangka Panjang di Taman Nasional Wakatobi: Apakah informasi yang diperoleh cukup berarti untuk pengelolaan dan konservasi?' (Cetacean Distribution Based on Long-Term Occasional Observation in Wakatobi NP: Is the information obtained sufficient meaningful for the management and conservation?) paper delivered at the 3rd Annual National Seminar on Fisheries and Marine Research, Semarang-Indonesia, 2 November 2013.

Sahri, A., Mustika, P.L.K., Dewanto, H.Y., and Murk, A.J.. 2020a. A critical review of marine mammal governance and protection in Indonesia. Marine Policy, 117C: 103893. https://doi.org/10.1016/j.marpol.2020.103893

Sahri, A., Putra, M.I.H., Mustika, P.L.K. and Murk, A.J. 2020b. A treasure from the past: Former sperm whale distribution in Indonesian waters unveiled using distribution models and historical whaling data. Journal of Biogeography, 7(10): 2102-2116. https://doi.org/10.1111/jbi.13931

Sahri, A., Mustika, P.L.K., Purwanto, P., Murk, A.J., and Scheidat, M. 2020c. Using cost-effective surveys from platforms of opportunity to assess cetacean occurrence patterns for marine park management in the heart of the Coral Triangle. Frontiers in Marine Science, 7: 569936. https://doi.org/10.3389/fmars.2020.569936

Sahri, A., Putra, M.I.H., Mustika, P.L.K., Kreb, D., and Murk, A.J. 2021. Cetacean habitat modelling to inform conservation management, marine spatial planning, and as a basis for anthropogenic threat mitigation in Indonesia. Ocean and Coastal Management, 205: 105555. https://doi.org/10.1016/j.ocecoaman.2021.105555

Taylor, B.L., Baird, R., Barlow, J., Dawson, S.M., Ford, J., Mead, J.G., Notarbartolo di Sciara, G., Wade, P. and Pitman, R.L. 2008. *Physeter macrocephalus*. The IUCN Red List of Threatened Species 2008: e.T41755A10554884. [Online]. Available at: http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41755A10554884.en

Wakatobi National Park. 2008. Rencana Pengelolaan Taman Nasional Wakatobi 1998-2023 (Management Plan of Wakatobi National Park 1998-2023). Baubau-Indonesia. 98 pp. Baubau: Wakatobi National Park.

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