

# Moreton Bay IMMA

## Description:

Moreton Bay in southern Queensland is a large shallow embayment (~1,500 km<sup>2</sup>) flanked by four large sand islands: North Stradbroke and Moreton Islands to the east, Bribie Island to the north, and South Stradbroke Island to the south. This area features the southernmost resident populations of dugongs and Australian humpback dolphins on the east coast, a substantial number of Indo-Pacific bottlenose dolphins and a narrow humpback whale migratory corridor along its seaward boundary. Humpback whales also often enter northern Moreton Bay as they return south, and the area is visited occasionally by New Zealand fur seals and southern right whales. Other species that are regularly sighted in shelf waters east of the sand islands include common bottlenose dolphins, common dolphins, Bryde's whales and dwarf minke whales. Most of the IMMA is within the Moreton Bay Marine Park, which has zones that restrict commercial and recreational fishing, and Go-Slow areas to limit vessel speed in dugong foraging habitat.

## Criterion A – Species or Population Vulnerability

Threatened species that are resident in the IMMA include substantial populations of Australian

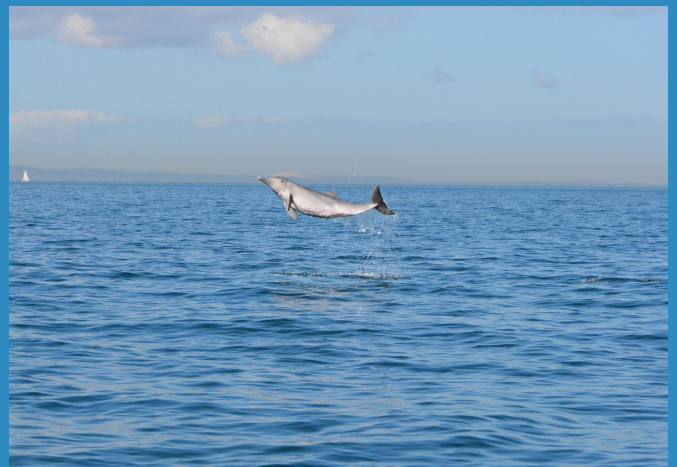
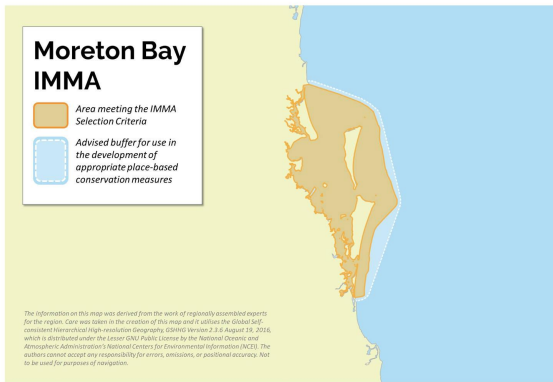


Figure 1 - An adult Australian humpback dolphin *Sousa sahulensis*, photo taken near the Port of Brisbane with Moreton Island in the background. Photo credit: Justin Meager, DES.



## Area Size

4,229 km<sup>2</sup>

## Qualifying Species and Criteria

Dugong – *Dugong dugon*

Criterion A, B2, C1, C2

Australian humpback dolphin – *Sousa sahulensis*

Criterion A, B1, D1

Indo-Pacific bottlenose dolphin – *Tursiops aduncus*

Criterion B1

## Marine Mammal Diversity

*Megaptera novaeangliae*, *Tursiops truncatus*,

*Eubalaena australis*, *Delphinus delphis*,

*Arctocephalus forsteri*, *Balaenoptera edeni*,

*Balaenoptera acutorostrata*

## Summary

Moreton Bay is a large subtropical embayment in southern Queensland with an abundant and diverse marine mammal assemblage and several features that make it an important area for marine mammals. It supports the most southern resident populations of dugongs and Australian humpback dolphins on the Australian east coast, is visited seasonally by migratory humpback whales and has significant populations of Indo-Pacific bottlenose dolphins. The population dynamics and ecology of the key species of marine mammals of Moreton Bay are well understood from decades of research in the region.



Figure 2 – An adult Indo-Pacific bottlenose dolphin, *Tursiops aduncus*, photo taken in Deception Bay with Mount Tibrogargan in the background. Photo credit: DES.

humpback dolphins and dugongs, which are both listed as Vulnerable by the IUCN (Parra et al., 2017, Marsh and Sobotzick, 2019) and under the State of Queensland's Nature Conservation Act 1992.

## Criterion B: Distribution and Abundance

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

The population size of Australian humpback dolphins in Moreton Bay was estimated to be between 119 and 163 from 1984 to 1987 (95% CI: 81–251; Corkeron et al., 1997), and more recently between 128 and 139 from 2014 to 2016 (95% CI: 67–274, J. J. Meager & E. R. Hawkins, unpubl. data). A recent study demonstrated long-term site fidelity and consistent habitat use in Moreton Bay from 1992 to 2016 (Meager et al., 2018). There are approximately 550 Indo-Pacific bottlenose dolphins in Moreton Bay in two genetically distinct sub-populations: the first in the northern Bay and the second in the southern Bay (Ansmann et al., 2012). The smaller southern subpopulation is estimated to be ~200 dolphins (Ansmann et al., 2013). Very high densities of Indo-Pacific bottlenose dolphins have been recorded adjacent to the rocky headlands of North Stradbroke Island (Chilvers and Corkeron, 2003), which is also within the IMMA.

### Sub-Criterion B2: Aggregations

The dugong population in Moreton Bay displays distinct aggregating behaviour that has been associated with feeding (Preen, 1995, Hodgson, 2004).

The eastern seagrass banks in Moreton Bay are the only known location in the dugong's range where a very high proportion of dugongs recorded during aerial surveys are consistently in large herds of up to several hundred animals (Preen, 1995, Hodgson, 2004, Sobotzick et al., 2017).

## Criterion C: Key Life Cycle Activities

### Sub-criterion C1: Reproductive Areas

The three resident species of marine mammals reproduce in the IMMA, as evidenced by observations of mating behaviour and neonates. Since 2000, the proportion of dugongs classified as calves in Moreton Bay during aerial surveys has been around 10%, varying much less than the other areas on the east coast of Queensland and indicating that Moreton Bay is a consistently important area for dugong reproduction (Sobotzick et al., 2017).

### Sub-criterion C2: Feeding Areas

Moreton Bay provides important foraging habitat for dugongs, and the locations of key foraging habitat for dugongs and humpback dolphins is well understood (e.g. Sobotzick et al., 2017, Meager et al., 2018). Moreton Bay supports extensive seagrass pastures for dugongs (Lyons et al., 2011).

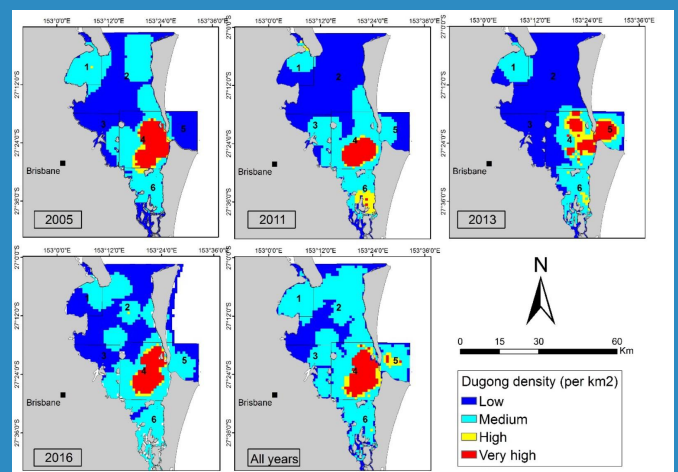


Figure 3 – 3 Spatially-explicit models of dugong density in Moreton Bay (Sobotzick et al., 2017) based on data from the aerial surveys conducted in 2005, 2011, 2013, and 2016, and all years combined. Dugong density estimates were generated using the Hagihara method (Hagihara et al., 2018). Dugong densities were classified as Low (0 dugongs per km<sup>2</sup>); Medium (0-0.5 dugongs per km<sup>2</sup>); High (0.5-1 dugongs per km<sup>2</sup>), and Very high (>1 dugongs per km<sup>2</sup>). Survey block numbers are indicated in the middle of each block.

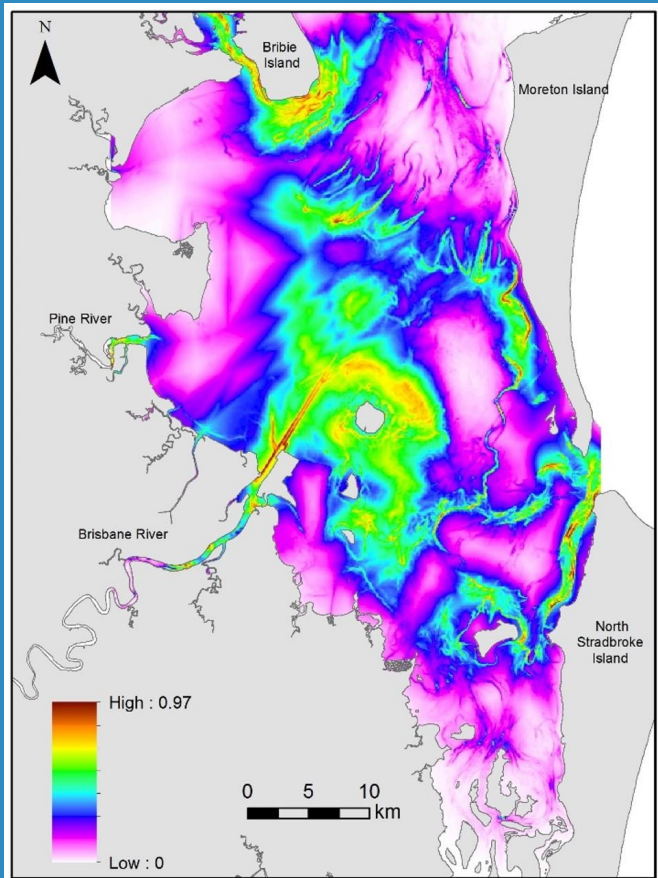


Figure 3 – Species distribution model for Australian humpback dolphins in Moreton Bay, based on the model published in Meager *et al.* (2018) and using data from 2005 to 2020. Warmer colours denote the most suitable habitat.

## Criterion D: Special Attributes

### Sub-criterion D1: Distinctiveness

The humpback dolphins in Moreton Bay represent a putative population with limited gene flow to the nearest population in the Great Sandy Strait (Parra *et al.*, 2018), and the social structure of the local population is highly fragmented with five separate communities and limited spatial overlap (Hawkins *et al.*, 2019).

### Supporting Information

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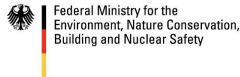
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