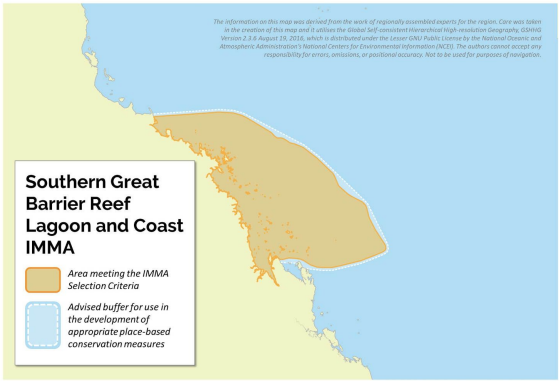

Area Size

84,807 km^2

Qualifying Species and Criteria

Humpback whale – *Megaptera novaeangliae*

Criterion B2, C1

Marine Mammal Diversity

Balaenoptera acutorostrata, Dugong dugon, Orcaella heinsohni, Sousa sahulensis, Stenella longirostris, Pseudorca crassidens, Tursiops truncatus, Tursiops aduncus

Summary

The southern Great Barrier Reef lagoon-waters contain the core breeding area of the East Australian humpback whale (*Megaptera novaeangliae*) population. Humpback whales annually migrate from Antarctic feeding grounds to the Great Barrier Reef for mating and calving, with the highest density of whales within this area (19.5˚S – 22˚S). There is no distinct separation of calving and mating areas due to groups containing a calf occurring in similar areas to groups without calves, although there is a greater dependence on coastal areas by mothers with calves as the breeding season progresses. This IMMA secondarily supports a diversity of marine mammals with at least two species of mysticete, six species of odontocetes (two of which are endemic to Australia and vulnerable; *Orcaella heinsohni* and *Sousa sahulensis*) and dugongs.

Southern Great Barrier Reef lagoon and coast IMMA

Description:

The east Australian humpback whale population (IWC breeding stock E1; BSE1) migrate in austral winter to this core breeding area within the Great Barrier Reef World Heritage Area, which encompasses the central and southern lagoonal waters (19.5˚S – 22˚S. The lagoonal water is the open water embedded by the inshore and offshore reefs, dominated by sand and mud with mobile sand dunes and minimal algae or seagrass. Humpback whales occur here between June and October, with peak whale abundance in August. This area is recognised as important for humpback whale mating and calving based on opportunistic sightings data (Simmons and Marsh 1986; Paterson and Paterson 1984; Chaloupka and Osmond 1999; Smith et al. 2012), dedicated aerial surveys (Smith et al. 2019; Smith et al. 2020) and satellite tagged whales (Gales *et al.* 2010). The aggregation extends from waters north of the Whitsunday Islands group (~19˚S), south to Shoalwater Bay (~22˚S). Within this range, groups without calves (proxy for mating areas) have a higher density offshore of Mackay and groups with calves (proxy for calving areas) occur in greatest density offshore of the Whitsunday region. As the breeding

Figure 1 - Aerial image of a humpback whale on the GBR. Photo credit: Josh Smith.

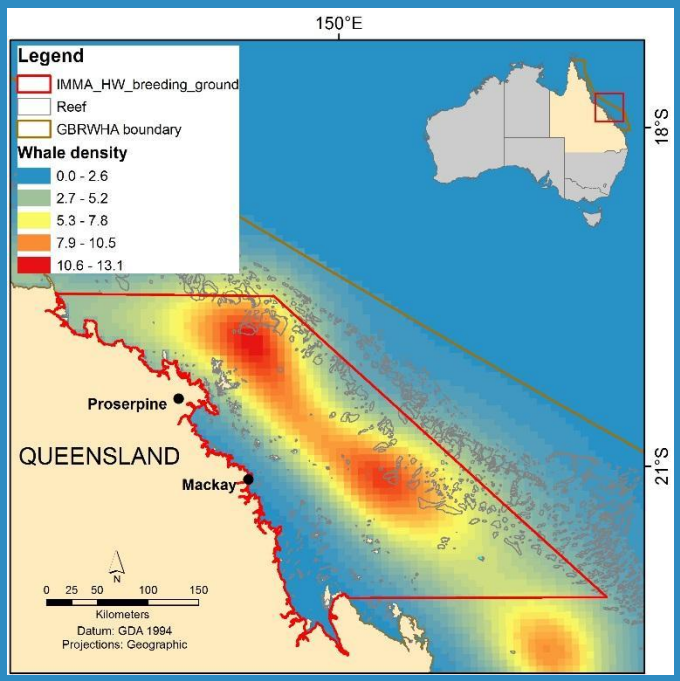

Figure 2 – Modelled humpback whale density for 'all whale' groups using 2012 and 2018 whale sighting data. Source: Smith et al. 2019.

season progresses from July to September, there is a shift in distribution of groups with calves in this area, to inshore waters closer to the coast (Smith *et al.* 2020).

The east Australian population of humpback whales (BSE1) was commercially hunted extensively in the 1950's and early 1960's, which resulted in a decline to approximately 1% of its original population (Paterson et al. 1994; Bannister & Hedley 2001). The population, however, has recovered strongly with a rapid and consistent rate of increase of 10-11% per annum since dedicated surveys began in the early 1980s (Paterson et al. 1994; Noad et al. 2019). They form an extensive aggregation that likely includes more than 30,000 whales, one of the largest whale aggregations in the world (Noad et al., 2019). This area also supports a diversity of inshore and offshore assemblages of secondary species of marine mammals, including at least two species of mysticete, six species of odontocetes (two of which are endemic to Australia and vulnerable) and dugongs.

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

The BSE1 humpback whale population annually migrate from Antarctic high latitude feeding grounds to the tropical, low latitude breeding grounds in the Great Barrier Reef (Chittleborough 1965; Dawbin, 1966). This is a well-known seasonal breeding aggregation of humpback whales and encompasses the core breeding area for this population (Chaloupka & Osmond, 1999; Simmons & Marsh, 1986; Smith et al., 2012; Smith et al., 2020; Smith et al. 2021). This is one of the largest whale populations in the world, with the population exponentially increasing at approximately 11% per year (Noad et al., 2011, 2019). The population is likely more than 30,000 whales (extrapolating from Noad et al., 2019), with the majority within the core breeding area at any point between July and September and peak whale abundance in August. The current population size is approaching or has reached modelled pre-exploitation population size (Noad et al., 2019).

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

This area is critical to reproduction for this population of humpback whales with the bulk of mating and calving presumed to occur here. Breeding activity is strongly supported by anatomical and physiological data from whaling data (Chittleborough, 1965), photographs of calves (Paterson & Paterson 1984) and observations of increasing numbers of calves in the area throughout the breeding season (Smith & Peel, 2020). There is evidence that groups with calves (proxy for calving areas) occur in greatest density in the northern region of this area (offshore of the Whitsundays) and groups without calves (proxy for mating area) have a higher density in the southern region of this area (offshore of Mackay) (Smith & Peel 2019). This is the main breeding area for this population (BSE1), although calving does occur to a lesser extent along the migratory corridor (Corkeron & Brown, 1995, Torres-Williams et al. 2019).

Supporting Information

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