

# Chesterfield–Bellona Coral Reef Complex and Seamounts IMMA

## Description

The Chesterfield-Bellona archipelago has been identified as one of the two hotspots targeted by 19th century commercial whaling of humpback whales in the South Pacific (Townsend, 1935), which suggests that it historically hosted large numbers of humpbacks. Four scientific expeditions conducted in 2002, 2010 (Oremus and Garrigue, 2014), 2016 and 2017 (Garrigue et al., 2020) have confirmed that whales are still present in the area. The lagoons enclosed within the Chesterfield-Bellona plateaus and the shallow banks of La Boussole, Vauban and Dumont D'Urville, are likely to serve as breeding and nursing grounds based on observations of numerous females with calves (Garrigue et al., 2020). Niche modelling based on sightings recorded during research surveys supports the suitability of Chesterfield-Bellona habitats for humpback whales (Derville et al., 2018; Garrigue et al., 2020). Finally, recent deployment of satellite tags (2016–2017) showed extensive humpback whale movement within the IMMA (Fig. 1) (Derville et al., 2020; Garrigue et al., 2020).

Other marine mammal species observed in the area include the spinner dolphin (*Stenella longirostris*), the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) and unidentified *Balaenoptera* spp. The paucity of records for marine mammals other than humpback whales is likely due to the logistical difficulty to survey this remote region, rather than the reflection of true absence.

## Criterion A: Species or Population Vulnerability

Recent multidisciplinary analyses combining satellite tracking, song analysis, photo-identification and genetics were conducted on humpback whales



## Area Size

59,852 km<sup>2</sup>

## Qualifying Species and Criteria

Humpback whale – *Megaptera novaeangliae*

Criteria A, B2, C1, C3

## Marine Mammal Diversity

*Stenella longirostris*, *Tursiops aduncus*, *Megaptera novaeangliae*

## Summary

The Chesterfield-Bellona coral reef complex and seamounts are a remote and vast region in the southwestern Pacific, with diversified marine habitats and very limited anthropogenic influence. This IMMA, located halfway between Australia and New Caledonia, includes two major underwater plateaus surrounded by barrier reefs and islets, and three unsheltered shallow banks (La Boussole, Vauban, and Dumont D'Urville). Further south, the IMMA includes several seamounts along the Lord Howe seamount chain (Nova, Argo, Kelso, Capel). The IMMA is for the most part located inside the Exclusive Economic Zone (EEZ) of New Caledonia and the Natural Park of the Coral Sea under the jurisdiction of the government of New Caledonia. As part of the park, a natural reserve (MPA IUCN category II) and an integral reserve (MPA IUCN category Ia) were created in 2018 over the Chesterfield-Bellona plateaus. A small portion at the southern extremity of the IMMA is located in international waters.

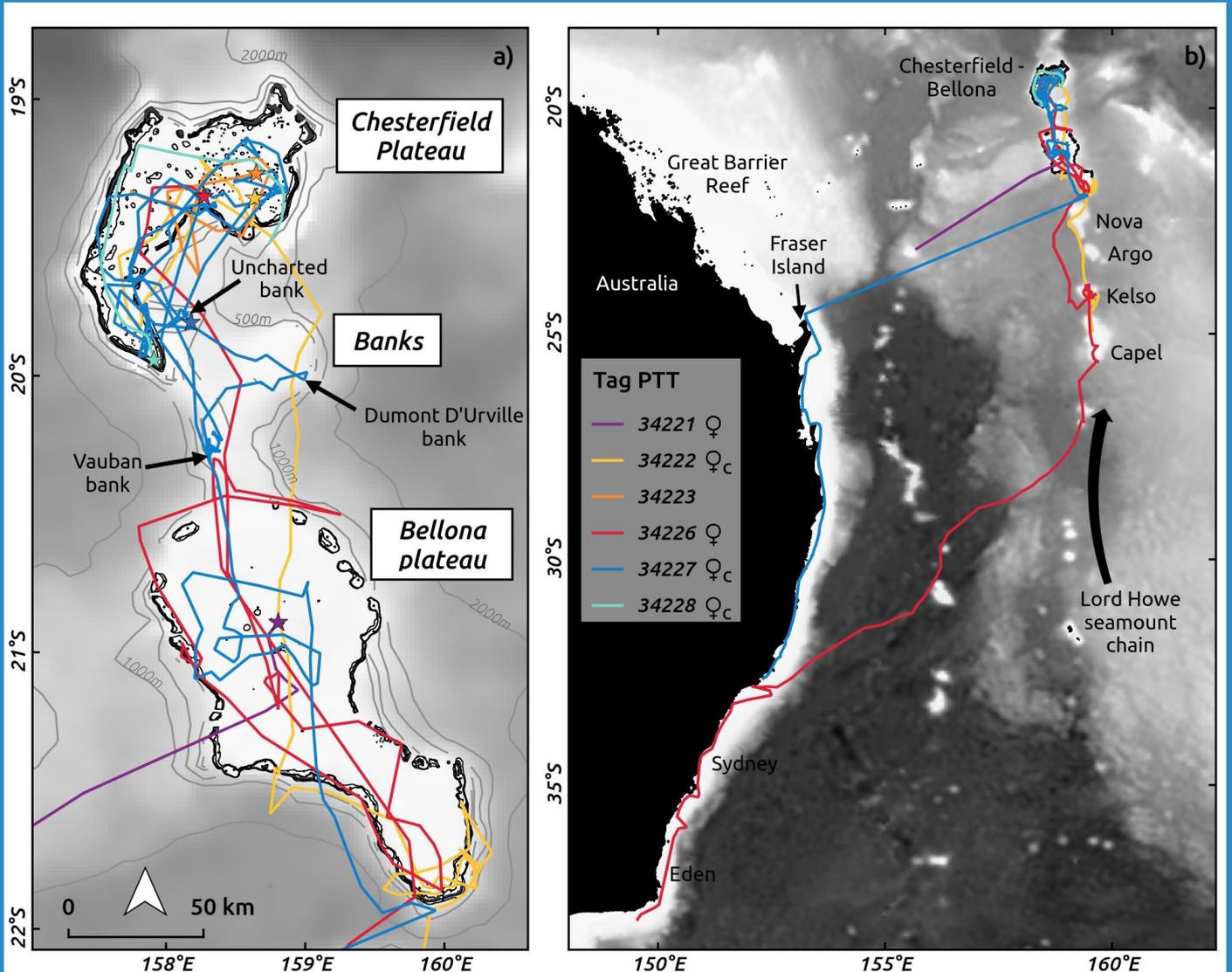


Figure 1: Satellite tracking of 6 humpback whales tagged in Chesterfield (n=4), Bellona (n=1), and the offshore banks (n=1) in 2017. a) Zoom on the Chesterfield-Bellona archipelago and b) whole tracks from start to end of transmission. Deployment positions are shown with stars. From: Garrigue et al., 2020.

visiting the Chesterfield-Bellona plateaus in austral winter. The results did not reveal the origin of this humpback whale population, but they did demonstrate a connection with the New Caledonia breeding sub-stock E2 classified as Endangered in the IUCN red list (Childerhouse et al., 2009) and with the neighbouring Australian Great Barrier Reef breeding population (Chaplin, 2018; Derville et al., 2020; Garrigue et al., 2020; 2015; 2010). Expeditions conducted in the Chesterfield-Bellona plateaus during 2016 and 2017 provided the first evidence on connectivity within this vast area. The comparison of photo-ID and genotypes collected during the 2016 and 2017 expeditions with the New Caledonian catalogues of humpback whales revealed that 34% of whales photo-identified during the expedition and 26% of those genotyped had previously been observed in the New Caledonia Main Lagoons and

Shelf Waters IMMA (Garrigue et al., 2020). In addition, two satellite tracked whales travelled from the New Caledonian Southern Seamounts and Banks IMMA where they were tagged and finally followed a direct route to this remote area.

## Criterion B: Distribution and Abundance

### Sub-criterion B2: Aggregations

Research surveys conducted in the IMMA have recorded a relatively low density of humpback whales (0.041 whales/km) compared to what could be expected from the 19th century whaling data (Garrigue et al., 2020; Oremus and Garrigue, 2014). No aggregation of humpback whales has recently been recorded, but historical whaling data suggest that

aggregations used to occur in the area (Townsend, 1935). No humpback whales were sighted on the Chesterfield plateau in 1992 (Gill et al., 1995), and very few were observed during two boat-based surveys conducted in 2002 and 2010 (Oremus and Garrigue, 2014). The Chesterfield-Bellona plateaus were more extensively surveyed in 2016 and 2017 during the "Marine Mammals of the Coral Sea" expeditions (MARACAS 1 and 3) and the highest densities of humpback whales were estimated over the offshore shallow banks (0.041 whales/km) separating the Chesterfield and Bellona plateaus. The encounter rate for the 2016-2017 surveys was estimated at 0.038 whales/km for the Chesterfield plateau and 0.035 whales/km for the Bellona plateau (Garrigue et al., 2020). Overall, the encounter rate was higher in 2017 (0.051 whales/km) than in 2016 (0.025 whales/km) suggesting some temporal variability in the numbers of humpback whales likely aggregating in the IMMA in each year.

## **Criterion C: Key Life Cycle Activities**

### **Sub-criterion C1: Reproductive Areas**

Given recent behavioural observations, the area appears to be used as a nursing ground and could also serve as a mating and calving ground (Garrigue et al., 2020; Oremus and Garrigue, 2014). During the MARACAS 1 and 3 expeditions, 44 % of all the humpback whale groups encountered included mothers with a calf. Genetic analysis of samples collected in the area also revealed a sex ratio largely skewed toward females (1:2.4). Although few competitive groups were observed, singing behaviour noted on multiple occasions during both expeditions attested to breeding activities (Chaplin, 2018; Garrigue et al., 2018; 2017).

## **Criterion C: Key Life Cycle Activities**

### **Sub-criterion C3: Migration Routes**

Although the IMMA is located under breeding latitudes for humpback whales, the area appears to also be used as a stop-over for longitudinal

migrations during the austral winter. Using the Capel and Kelso seamounts as stepping-stones, two males tagged in southeastern New Caledonia crossed the Coral Sea to reach the East Australian coast south of the E1 Great Barrier Reef breeding grounds (Derville et al., 2020). Furthermore, whales tagged over the Chesterfield-Bellona plateaus stopped over the Capel and Kelso seamounts while initiating their southern migration (Derville et al., 2020). Satellite tracking therefore suggests that the seamounts located in the southern part of the IMMA are crossroads for humpback whales migrating through the Coral Sea.

## **Supporting Information**

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## Acknowledgements

We would like to thank the participants of the 2017 IMMA Regional Expert Workshop held in Apia, Samoa for the identification of IMMAs in the Pacific Islands Region. 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 SPREP, the French Biodiversity Agency, Whale and Dolphin Conservation and the Tethys Research Institute.



**MARINE MAMMAL PROTECTED AREAS TASK FORCE**

IUCN SSC WCPA IMMA

GOBI TETHYS since 1986 WDC WHALE AND DOLPHIN CONSERVATION

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

based on a decision of the German Bundestag

OFB OFFICE FRANCAIS DE LA BIODIVERSITE SPREP Secretariat of the Pacific Regional Environment Programme

Suggested Citation: IUCN-Marine Mammal Protected Areas Task Force, 2021. Chesterfield-Bellona Coral Reef Complex and Seamounts IMMA Factsheet. <https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/PacificIslands/chesterfield-bellona-coral-reef-complex-seamounts-PacificIslands.pdf>. Downloaded on (day month year).

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