

Albany Canyon Region IMMA

Summary cont....

important area for sperm whales. The Bremer Sub-basin supports a genetically distinct population of killer whales (*Orcinus orca*) which are the largest known aggregation in Australian waters, with >140 individuals currently recognised through photo-identification. The presence of killer whales in the Bremer Sub-Basin is most likely linked to seasonal productivity and upwelling of nutrient rich waters.

Description:

The Albany Canyon Region IMMA encompasses an extensive network of steep, shelf-incising, and highly productive submarine canyons off the continental shelf of southwest Australia. It includes the Albany Canyon group, adjacent shelf break, and the Bremer Sub-basin. The submarine canyons, which are 40-90 kilometers south of the southwest Australian coastline, have been identified as a key ecological feature as they are linked to localized, periodic upwellings that enhance productivity and attract aggregations of marine life including cetaceans. The



Area Size

90,657 km²

Qualifying Species and Criteria

Sperm whale – *Physeter macrocephalus*

Criterion A, B2, C2

Killer whale – *Orcinus orca*

Criterion B2, C2

Marine Mammal Diversity

Delphinus delphis, *Stenella coeruleoalba*,
Balaenoptera musculus intermedia, *Balaenoptera musculus brevicauda*, *Balaenoptera physalus*,
Megaptera novaeangliae, *Eubalaena australis*,
Mesoplodon layardii, *Pseudorca crassidens*,
Globicephala melas

Summary

Sperm whales (*Physeter macrocephalus*) inhabit and forage in deep offshore areas of the world's oceans and were hunted extensively across all oceans for two centuries. Data from historical and commercial whaling catches, aerial surveys, modern passive acoustic studies and research voyages have identified submarine canyons in the southwest Australia region as important habitat for sperm whales and other cetaceans. The Australian Government has cited this region as a biologically

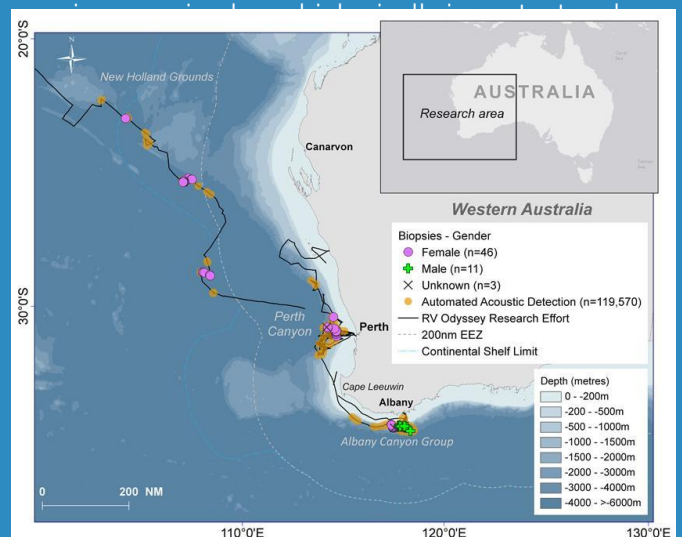


Figure 1 - The south-eastern Indian Ocean study area with the track of the RV Odyssey, locations of the biopsy samples and gender of the sampled sperm whales, all automated acoustic detections of sperm whales recorded by Rainbow Click and bathymetry (Johnson et al. 2016).

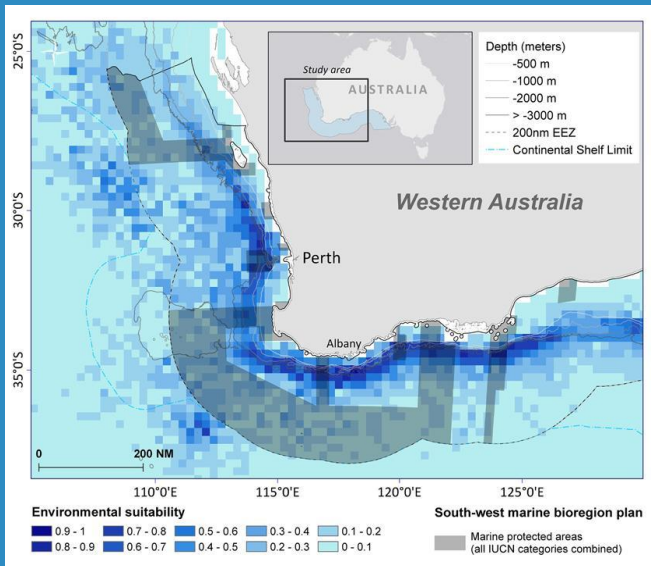


Figure 2 – Sperm whale distribution model of suitable habitat displayed in 15 nautical mile grid cells for summer/autumn seasons combined at 95% confidence level. The boundaries of the south-west marine bioregion proposed protected areas (shaded in dark gray – 2016 version) displayed over the species distribution model (Johnson et al., 2016).

productive marine ecosystem, hosting a large number of marine megafaunal species (e.g. seabirds, pelagic sharks and fishes, cetaceans, pinnipeds and reptiles). The IMMA supports a diversity of vulnerable, near threatened, and data deficient cetaceans. Some species are seasonally resident, while others are transient or migratory. Of particular significance are the year-round sperm whale and killer whale aggregations.

Criterion A: Species or Population Vulnerability

Data from historical and commercial whaling catches, aerial surveys, modern passive acoustic studies and research voyages have identified submarine canyons in the southwest Australia region as important habitat for sperm whales and other cetaceans (Bannister, 1964, 1968; Bouchet, Meeuwig, et al., 2018; Carrol et al. 2014; Johnson et al., 2016; Salgado Kent et al., 2020). The sperm whale is listed as “Vulnerable” on the IUCN Red List and by the State Government of Western Australia (Biodiversity Conservation Act 2016). Sperm whales inhabit and forage in deep offshore areas and were hunted extensively across all oceans for two centuries.

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

Killer whales have been reported to concentrate in the Bremer Sub-basin over the austral summer and autumn months, forming what is believed to be the largest known aggregation of the species in Australian waters with >140 individuals photo-identified as of 2019 (Bouchet, Wellard, Erbe, & Meeuwig, 2018; Wellard & Erbe, 2017). Satellite tracks of tagged individual killer whales show movement all along the canyon shelf from Hood Canyon, offshore Bremer Bay, Western Australia to Albany Canyon, offshore Albany, Western Australia.

From 1936 to 1978, 16,080 sperm whales were killed offshore in the southwest of Australia primarily from the Cheynes Beach whaling station in Albany. The International Whaling Commission (IWC) commercial whaling records indicate that sperm whales used the Albany canyons year-round (Johnson et al., 2016). Visual observations conducted on recent research voyages revealed that sperm whales are utilising the region offshore from Albany through to Bremer Bay (Bouchet, Meeuwig, et al., 2018; Salgado Kent et al., 2020).

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

Typical sperm whale foraging habitat is in water over 400 m deep along continental slopes and ridges including areas of high bottom relief (Jaquet and Whitehead, 1996; Hooker et al., 1999; Pirotta et al., 2011), coastal upwelling of cold, nutrient-rich waters (Rendell et al., 2004), thermal fronts (Griffin, 1999) and areas of high primary productivity (Jaquet and Whitehead, 1996). Sperm whales are highly acoustic animals that echolocate almost continuously by emitting powerful, regular, highly directional clicks of frequencies of 8–26 kHz to navigate and find prey (Jaquet et al., 2001; Madsen et al., 2002; Wahlberg, 2002; Møhl et al., 2003). On average, they spend more

than 72% of their time in foraging dive cycles with durations that can last up to an hour to depths averaging 400–1200 m and up to 2000 m (Watwood et al., 2006). The Odyssey expedition recorded feeding dives in the region using a hydrophone array while searching for and tracking sperm whales to obtain tissue biopsies (Johnson et al., 2016). A study modelling historical and modern data on sperm whale visual and acoustic 'presence' found that the southwest canyons of the continental shelf from Leeuwin Western Australia, east to Esperance, Western Australia are important foraging habitat for sperm whales (Johnson et al., 2016). The Australian government has identified this region to be a biologically important area for sperm whale foraging (Department of Environment, 2012b).

Dedicated research on killer whales in the region has shown that the Bremer Sub-Basin is important offshore habitat, with photo-identified individuals recaptured over multiple seasons and engaged in feeding behaviour not previously documented (Salgado Kent et al., 2020; Bouchet et al, 2018; Wellard & Erbe, 2017; Wellard et al., 2016).

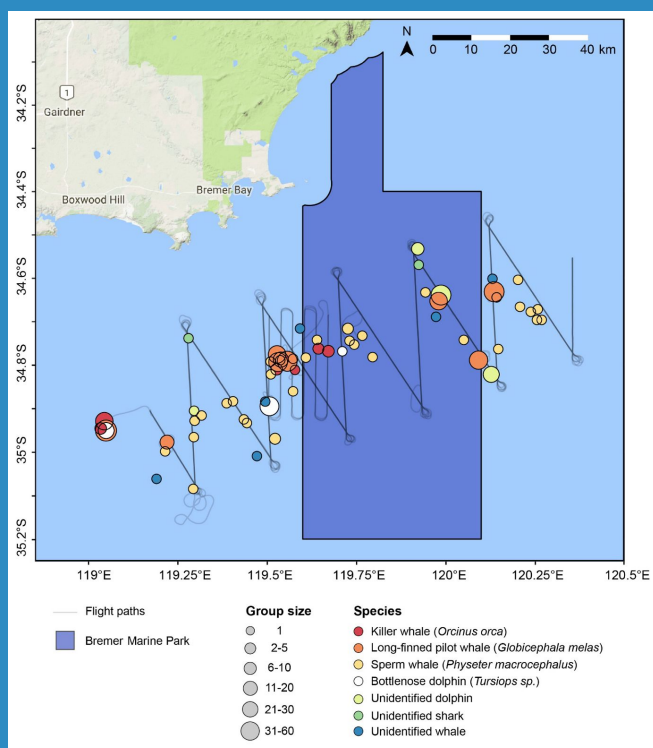


Figure 3 - Visual sightings of marine megafauna during aerial surveys of the Bremer Marine Park and adjacent regions. Aerial transects are shown in semi-transparent grey, such that they appear darker (black) in areas where they overlap (Bouchet et al, 2018).

Supporting Information

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MARINE MAMMAL PROTECTED AREAS TASK FORCE

IMMA

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GOBI **TETHYS since 1986** **WDC**

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