

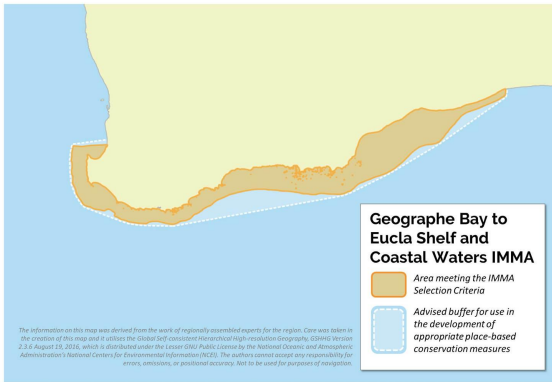
Geographe Bay to Eucla Shelf and Coastal Waters IMMA

Summary

The IMMA area delineated includes overlapping habitats in which: resident endangered Australian sea lions (Goldsworthy et al. 2009) and resident New Zealand fur seals (Campbell et al. 2014) breed, haul-out, and forage. Southern right whales breed and nurse their young (DSEWPaC 2012) in the IMMA, and endangered blue whales and humpback whales (Childerhouse et al. 2008) migrate through (McCauley & Jenner 2010; Salgado Kent et al. 2014). The area includes waters from the coast out to the edge of the continental shelf at locations where Australian sea lions and New Zealand fur seal colonies occur, in order to include their foraging areas. It extends out to 3 nm from the coast for southern right whales in all other areas. Part of the migratory corridor for pygmy blue and humpback whales occurs within the IMMA between the coast and continental shelf. The most western parts (Geographe Bay, the Cape Naturaliste and Cape Leeuwin region and Naturaliste Plateau) are particularly important for migrating whales of both species, including mothers nursing calves following the coast on their way south (Salgado Kent et al. 2014).



Figure 1 – Humpback whale (*Megaptera novaeangliae*) in Geographe Bay, Western Australia.
Photo: Chandra Salgado Kent



Area Size

123,161 km²

Qualifying Species and Criteria

Southern right whale – *Eubalaena australis*
Criterion B2, C1, C3

Humpback whale – *Megaptera novaeangliae*
Criterion 2, C3

Pygmy blue whale – *Balaenoptera musculus breviceuda*
Criterion A, B2, C3

Australian sea lion – *Neophoca cinerea*
Criterion A, C1

New Zealand fur seal – *Arctocephalus forsteri*
Criterion C1, C2

Marine Mammal Diversity

Tursiops aduncus, *Delphinus delphis*, *Balaenoptera musculus*, *Globicephala melas*, *Balaenoptera bonaerensis*, *Pseudorca crassidens*, *Orcinus orca*, *Kogia breviceps*, *Physeter macrocephalus*, *Caperea marginata*, *Tasmacetus shepherdii*, *Mesoplodon grayi*, *Ziphius cavirostris*

A wide range of other whale species are known to occur in the region and include: dwarf minke whale, fin whale, pygmy right whale, sperm, pygmy sperm, and dwarf sperm whales, and strap-toothed, Gray's and Cuvier's beaked whales (Groom & Coughran, 2012; Groom, Coughran & Raudino 2014). These other species may transit the area and forage or calve in it.

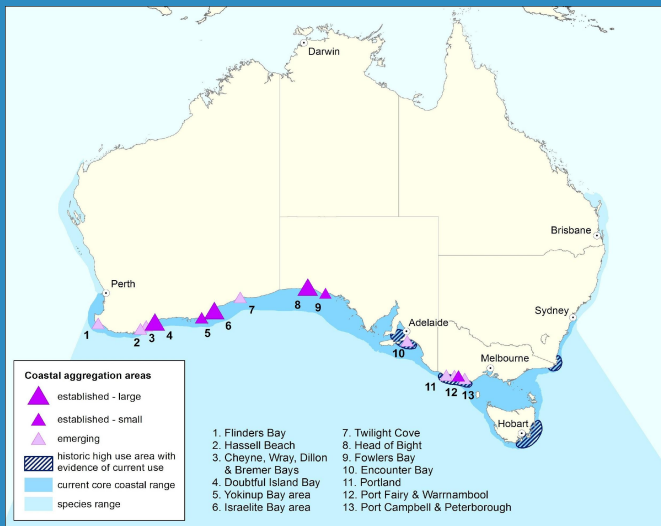


Figure 2 – Historical, established and emerging aggregation areas for southern right whales (DSEWPaC, 2012)

Description:

The area delineated includes overlapping habitats in which: resident endangered Australian sea lions (ASLs) (Goldsworthy et al. 2009) and resident New Zealand fur seals (Campbell et al. 2014) breed, haul-out, and forage, southern right whales (endangered in Australia) breed and nurse their young (DSEWPaC 2012), and endangered blue whales and humpback whales (part of the IUCN listed endangered Oceania sub-population; Childerhouse et al. 2008) migrate (McCauley & Jenner 2010; Salgado Kent et al. 2014). The area includes waters from the coast out to the edge of the continental shelf at locations where ASL and New Zealand fur seal colonies occur, in order to include their foraging areas (for ASLs, but may fall short of that for New Zealand fur seals as their exact range is unknown); and extends out to 3 nm from the coast for southern right whales in all other areas.

Part of the migratory corridor for pygmy blue and

humpback whales occurs within the IMMA between the coast and continental shelf. The most western parts (Geographe Bay, the Cape Naturaliste to Cape Leeuwin region and Naturaliste Plateau) are particularly important for migrating whales of both species, including mothers and nursing calves following the coast on their way south (Salgado Kent et al. 2014). A wide range of other whale species are known to occur in the region and include: dwarf minke whale, fin whale, pygmy right whale, sperm, pygmy sperm, and dwarf sperm whales, and strap-toothed, Gray's and Cuvier's beaked whales (Groom & Coughran, 2012; Groom, Coughran & Raudino 2014).

These species may transit the area and forage or calve in it.

Criterion A: Species or Population Vulnerability

Blue whales are listed as Endangered globally (IUCN 2020) and in Western Australia (WA) (Biodiversity Conservation Act, 2016). The total eastern Indian Ocean blue whale population last estimated in 2010 was small at 662-1559 individuals (McCauley & Jenner 2010) and is presumably still recovering from commercial whaling. Australian sea lions are globally listed as Endangered (IUCN 2020) and are Vulnerable within WA (Biodiversity Conservation Act 2016). The species is endemic to Australia, occurring only in WA



Figure 3 – Female Australian sea lion, Western Australia. Photo: Chandra Salgado Kent

and South Australia. Some breeding island sub-populations are in decline, and none are increasing (Friedman and Campbell 2014; Goldsworthy et al. 2021).

Criterion B: Distribution and Abundance

Sub-criterion B2: Aggregations

Sheltered, coastal waters of the area, stretching from Geographe Bay (most westerly area) to Israelite Bay (most easterly area), contain important calving grounds for southern right whales; a species having high calving ground site fidelity with mothers returning to calve at the same locations. Large established aggregation areas are recognized (according to the Commonwealth criteria) at Doubtful Island and Israelite Bays, while a small established area is recognized at Yokinup Bay (DSEWPaC 2012). Twilight Cove, Hassel Beach, Cheyne, Wray, Dillon and Bremer Bays are recognized as emerging coastal aggregation areas. While not yet recognised in Commonwealth aggregation area criteria, Point Charles Bay (from Point Anne to Point Charles), Cheynes Beach, King George Sound, and Geographe Bay are regularly used by southern right whales for calving and by resting mothers nursing young calves (Bannister 2001; Salgado et al., 2022). The broad coastal area within this IMMA is important as part of the network of critical calving grounds for the population. In particular, the zone from the coast up to ~2-3 km from shore along the entire southern coast of Australia is important for coastal movement corridors for southern right whales. Movement of calving and non-calving adults has been recorded across broad distances both within and across seasons (Pirzl et al. 2009).

The total eastern Indian Ocean blue whale population was estimated at 662-1559 individuals in 2010 (McCauley & Jenner, 2010). Large numbers of pygmy blue whales from this population (and probably some Antarctic blue whales) with calves use Geographe

Bay and the Naturaliste Plateau as a narrow transit corridor (Recalde-Salas 2014; Salgado Kent et al. 2012; Salgado Kent et al. 2014). Because of this narrow corridor and the relatively large number of whales using it, the area is judged as one where 'aggregation' occurs. Southbound blue whales move slowly into Geographe bay following the shallow bathymetry, often travelling within 100 m of the shore. In recent years shore-based day-time counts have recorded up to ~250 blue whales (Burton, unpublished data). Peak numbers are observed October-December. Flinders Bay and the Naturaliste Plateau and westward are also used by northward migrating blue whales between ~March-May (Gavrilov et al. 2012). During their northbound migration, humpbacks also occur in higher densities in Geographe Bay and offshore, and within sheltered areas on the southwest coast such as Flinders Bay and King George Sound. On their southward migration, humpbacks often rest and nurse their calves and socialize in large, competitive groups. Peak numbers are observed between September-November, with ~4700 humpback whales counted migrating through Geographe Bay in a season during day-time shore-based counts (Burton, unpublished data). Because of this narrowing of the corridor, namely for southbound mothers and calves, 'the area is judged as one where 'aggregation' occurs. Flinders Bay and bays on the

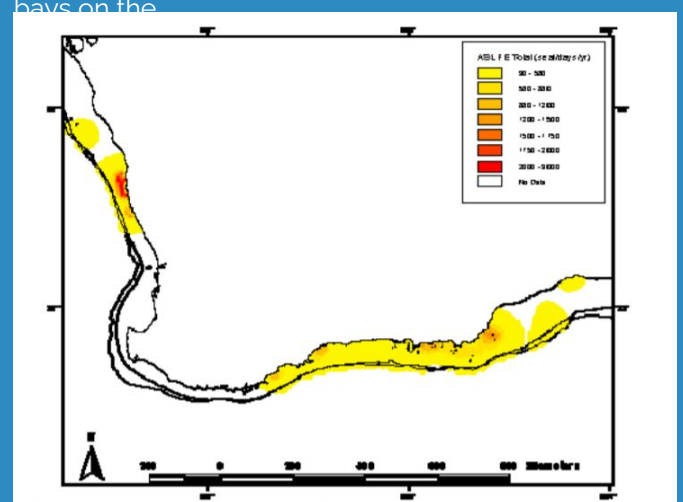


Figure 4 - Spatial model of the total foraging effort of the Australian sea lion population in WA expressed as the number of seal-foraging days per year (Source: Goldsworthy et al. 2009a).

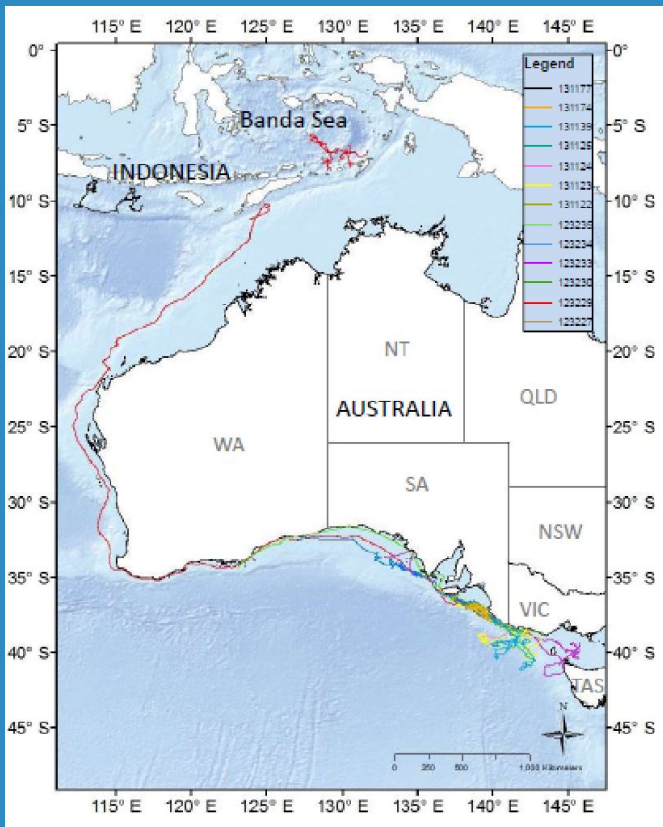


Figure 5 - Satellite tracks of 13 blue whales from the Bonney Upwelling. (Source: Moller and Attard 2015).

southwest coast are used by northward migrating humpback whales between ~June-August.

Criterion C: Key Life Cycle Activities

Sub-criterion C1: Reproductive Areas

Australian sea lions are endemic to Australia, occurring only in Western Australia and South Australia. It is unique in having large numbers of small breeding colonies, low reproductive rates, an unusually long and asynchronous breeding cycle (17-18 months), high site fidelity, and poor dispersal (Campbell et al. 2008 Lowther et al. 2012). This IMMA includes the majority of breeding islands in Western Australia, representing around 30% of the breeding sites (Goldsworthy et al. 2014; Shaughnessy et al. 2005). The high degree of site fidelity exhibited by females means that each breeding colony has become somewhat genetically isolated, making this species highly vulnerable to local extinction of breeding colonies (Campbell et al. 2008). New Zealand fur seals breed on offshore islands between southern Western Australia and New Zealand

and some Subantarctic islands (Shaughnessy 1999). During recent decades, New Zealand fur seals have been experiencing a healthy recovery from sealing. In Australia, while there is genetic exchange between the populations in WA and the east coast, colonies are separated by the Great Australian Bight (>750 km; Berry et al. 2012). In Western Australia, all 20 of the known breeding colonies are located within the IMMA (Campbell et al. 2014), and were estimated to make up 14% of the population size in Australia during the 2010 – 2014 time period (Shaughnessy et al. 2015).

Within the sheltered, coastal waters of the IMMA, stretching from Geographe Bay (most westerly area) to Israelite Bay (most easterly area) important calving grounds are located for southern right whales; a species having high calving ground site fidelity with mothers returning to calve at the same locations over years (Bannister 2001).

Sub-criterion C2: Feeding Areas

In Western Australia, all 20 of the known breeding colonies of New Zealand fur seal (Campbell et al. 2014) estimated to make up 14% of the population size in Australia during 2010 – 2014 (Shaughnessy et al. 2015) are within the IMMA. The area includes waters from the coast out to the edge of the continental shelf occupied by fur seals during foraging trips from their haul-out and breeding colonies, acting as central place foragers (Kirkwood and Goldsworthy 2013). While some New Zealand fur



Figure 6 – Humpback whale fluke in Geographe Bay. Photo: Chandra Salgado Kent

seals likely forage further offshore than other animals in the population, the exact extent of such foraging movements in the region is presently unknown.

Sub-criterion C3: Migration Routes

Pygmy blue whales use offshore and coastal waters of the south coast as part of a transit corridor during migration westward from the Bonney Upwelling foraging area to the Perth Canyon foraging area between February to June. More specifically, satellite tracking data from pygmy blue whales tagged off Western Australia (Double et al. 2014; Owen et al. 2016) and in the Bonney Upwelling (Möller and Attard, 2015) off South Australia have identified the area from near King Island in southeast Australia up to the Banda and Molucca Seas as the migratory pathway of pygmy blue whales.

The movement of Southern right whales between coastal aggregation areas within and across seasons, shows that the corridor between the aggregation areas is important connective habitat. Results from a study at the Head of Bight of Southern Australia support the view that greater southern right whale abundance promotes increased linkage via connective corridors between aggregation areas (Charlton et al. 2019b). Within and between season movements of southern right whales on the southern Australian coastline were documented further east by Burnell (2001). While studies on southern right whales in the southwest of Australia are limited, within year movements of the same sub-population on the south coast of Australia averaged 730 km, over 34 days. The maximum reported within season movement of an individual southern right whale across coastal southern Australia is 1,490 km (Burnell 2001).

During migration, humpback whales occur in high densities in Geographe Bay and along the west coast of the region, and within sheltered areas on the

southwest coast such as Flinders Bay and King George Sound. Peak numbers are observed September–November, with ~4700 humpback whales counted migrating south through Geographe Bay in a season during day-time shore-based counts (Burton, unpublished data). This area is considered the last sheltered area they rest in during their migration from low latitude breeding grounds to high latitude feeding grounds (Salgado Kent et al. 2014). Flinders Bay, King George Sound, and coastal areas along the southwest coast are used by northward migrating humpback whales mostly between ~ humpback whales, 9 of which had calves in them (Salgado Kent, unpublished; data provided by 'Sail-A-Way', 2012). Six were southern right whales, two of which had calves in them. May–August. Flinders and King George Sound are areas of whale watching operations with humpbacks and southern right whales as focal species. For example, encounters by one tour vessel in King George Sound in 2012 included a total of 419 whales in 90 groups, 11 of which had calves in them. Of the groups, 84 were humpback whales, 9 of which had calves in them. Six were southern right whales, two of which had calves in them (Salgado Kent, unpublished; data provided by "Sail-A-Way" in 2012).

Supporting Information

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**MARINE MAMMAL
PROTECTED AREAS
TASK FORCE**

IUCN SSC WCPA IMMA

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based on a decision of the German Bundestag

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<https://www.marinemammalhabitat.org/portfolio-item/geographe-bay-eucla-shelf-coastal-waters/>

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