Photographic identification of killer whales (*Orcinus orca*) in the Bremer Sub-Basin, southwest Australia

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Introduction

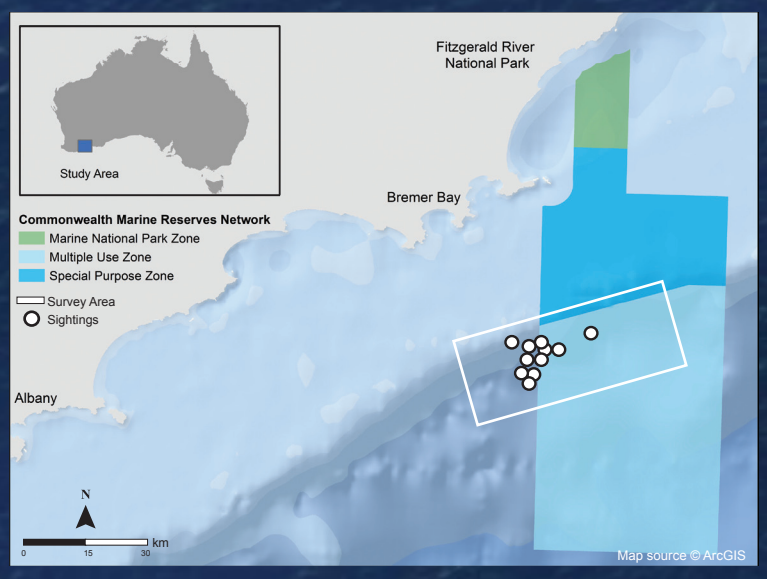
We present photographic evidence of a large aggregation of killer whales (*Orcinus orca*) in the Bremer Sub-Basin region, southwest Australia. Dedicated studies of killer whales throughout the southern hemisphere have increased the knowledge of this species. However, due to a lack of dedicated field research in Australian territorial waters, the species remains poorly understood in this region.

Based on fin identification data collected, the Australian Orca Database has been able to demonstrate known groups of killer whales in Australian territorial waters to be highly transient and known to be wide ranging, making them difficult to study. To date, there have been no published research on killer whales in Australian territorial waters[1], with most sighting data collected by the general public, as well as recreational, and commercial vessel operators. Despite this, the AOD has been successful in building an extensive fin identification catalogue. Using this catalogue, it has been possible to identify re-sights of individuals and groups over time. One individual known as 'Split Fin' was first recorded in Eden NSW in 1996 and has been sighted a further 2009[2] and then again in Jervis Bay in 2009 and 2012[3].

The current research is based around the small geographical area within the Bremer Sub-Basin region, a productive marine ecosystem, where nutrient rich deep waters supports blooms which in turn, leads to high productivity and supports extended food chains characterised by feeding aggregations.

Our data supports a short-term temporary seasonal site fidelity for individual killer whales.

SplitFin, Eden 2009



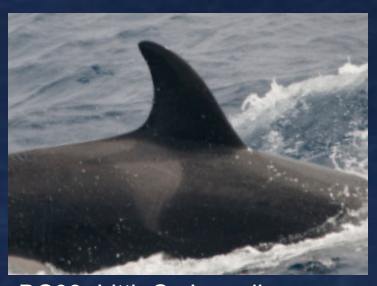
Map Bremer Sub-Basin region, southwest Australia

Site Location

- The Bremer Sub-Basin is located approximately 42km offshore of Bremer Bay in southwest Australia.
- The survey area is approximately 1100km^2
- Bremer Commonwealth Marine Reserve is 2500km^2, comprised three zones; Marine National Park Zone, Multiple Use Zone and Special Purpose Zone includes oil and gas prospects, with water depths ranging from 15 - 5,000m[4]
- The area has relatively low vessel traffic, with very few recreational boat users.

Photo identification used for the Bremer Sub-Basin killer whales


BC02_Ccup


BC03_LittleC, Juvenile


BC04_Mr Knobels


BC18_SplitFinger


BC05_BaseCut


BC09_WedgeCut


BC29_Roger Tall


BC17_ Triangle Boy


BC08_ReversKick


BC12_ Staples

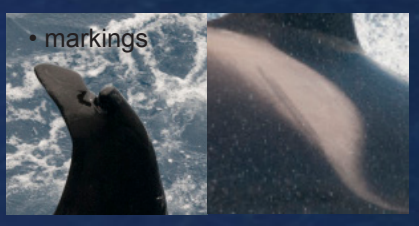

BC14_Mr Big


BC22_2Cuts

Photo identification methods used for killer whale ID

Shape, size and coloration of;

- Left and right dorsal fin
- Eye patch, saddle and cape
- Significant body markings



Methods

- Sighting data was collected during surveys over a 10-day survey period in February 2014.
- Data collected included date, time, GPS coordinates, water depth, group composition, number of individuals, associations, sex (if possible) and behaviour.
- Images collected were then scrutenised to detect individuals and added to the "killer whale canyon" catalogue.
- Post field activities, the catalogue was searched to identify re-sightings of individual killer whales.

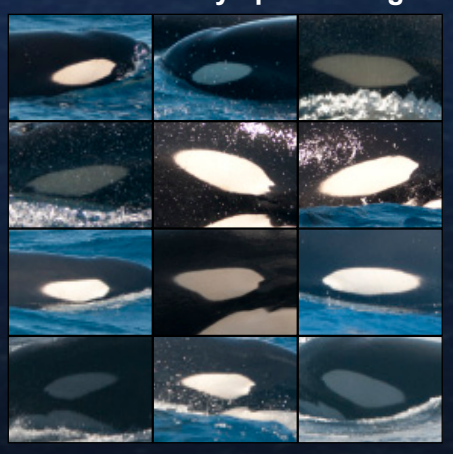
Results and Discussion

- Over the 10-day survey period and 88 hours of survey time, 708nm was travelled, 34 sightings of killer whales were made which resulted in 6300 images taken with up to 40 individuals identified from marked and clean dorsal fins.
- Killer whale group size ranged from 2 ~ 30
- Water depth of sightings ranged from 800 to 1800m
- Species sighted included killer whales, pilot whales, sperm whales, bottlenose dolphin, beaked whale and fur seals.

Conclusions

- The Bremer Sub-Basin area is the only place known to host large aggregations of killer whales in Australian waters.
- The function of these aggregations is yet to be fully understood.
- Preliminary data collected during this survey will form the basis of a long-term study on killer whales in southwest Australia.
- Photo identification of individual animals in this area is necessary to collate critical data on this species[2].
- The results of photo ID efforts in this region will be added an Australia wide catalogue to assist in determining a population estimate for the species in Australian Territorial waters and as well as understanding sub-populations of the species.
- The Bremer Sub-Basin is likely to be an area of significance for aggregations of killer whales and a range of other marine species.
- Ongoing research of killer whales in this unique region, is critical in building an understanding of the role of this location in killer whale ecology.
- The information gathered from research efforts will provide critical data to help inform on future management decisions.

A selection of eye patch images



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