

Little is known of inshore dolphins in the remote waters of the Kimberley region of WA, which provide a challenging yet spectacular environment in which to work. Pictured: Razor Islands, Cone Bay. (Photo: Alex Brown)

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Estimating the abundance of inshore dolphins in the Kimberley, north-western Australia

Assessing the abundance of wildlife populations is essential to their effective conservation and management. Concerns have been raised over the vulnerability of tropical inshore dolphins in waters off northern Australia to anthropogenic impacts on local populations, yet a lack of abundance data precludes assessment of their conservation status and the management of threats.

Of particular interest are the Australian snubfin (*Orcaella heinsohni*) and Australian humpback dolphin (*Sousa sahulensis*), which are endemic to northern Australia and shallow waters off southern New Guinea.

This recently published study (Brown et al. 2016) provides the first estimates of abundance for snubfin, humpback and Indo-Pacific bottlenose dolphins across five study sites in the remote Kimberley region of north-western Australia.

Methods

Systematic boat-based surveys were conducted during the early and late dry seasons from 2012–14 (Figure 1). Over this period, five different sites, each of c. 130km², were surveyed, some up to four times. Photo-identification techniques were used to identify individual dolphins from distinctive marks on their dorsal fin (Figure 2), which facilitated the use of capture-recapture models to estimate the abundance of each species within a specific study site.

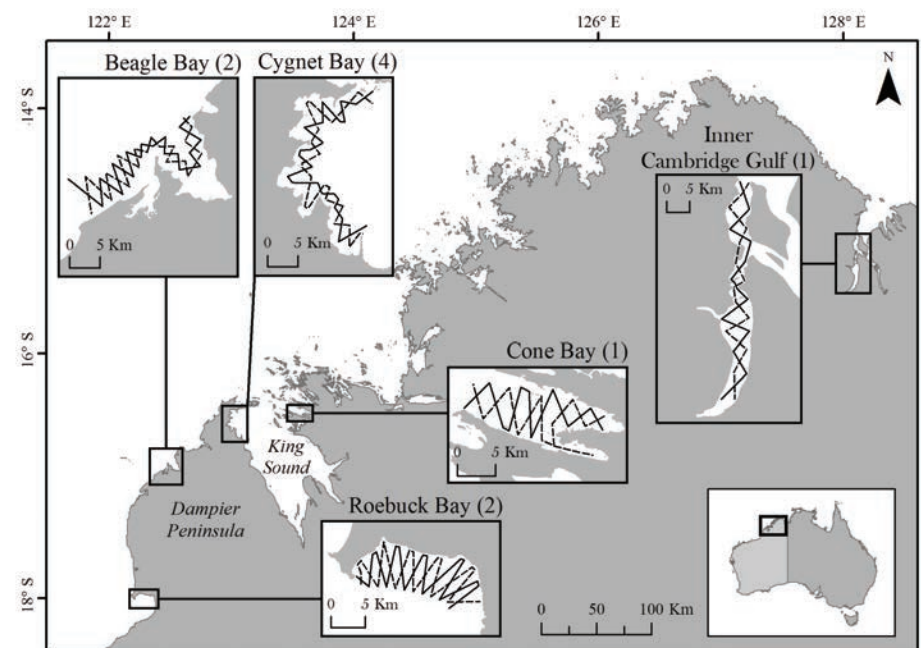


FIGURE 1 The Kimberley coastline of north-western Australia, showing study site locations. Numbers in parentheses indicate the number of sampling periods at each site. Insets show the two opposing zig-zag transect routes at each site. The coastline illustrated corresponds to the highest astronomical tide

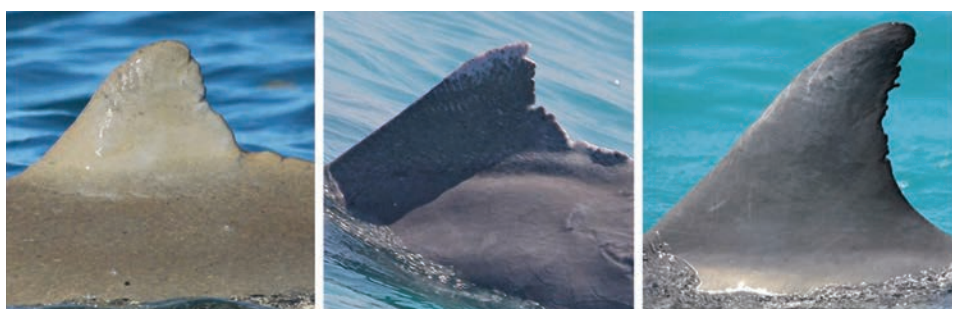


FIGURE 2 High-quality photographs of distinctive dorsal fins of snubfin (left), humpback (middle) and bottlenose (right) dolphins allowed the identification of specific individuals

Results and discussion

Over some 1,300 hours on the water, the research team zig-zagged their way through 3,300km of survey lines and identified a total of 424 individual dolphins. Key results included:

- The abundance of each species was highly variable between the different study sites, likely reflecting different habitat preferences by each species (Figure 3).
- The estimated abundance of most species was ≤ 60 individuals (excluding calves), and fewer than 20 humpback dolphins were identified at each site in any one visit to a site.
- Estimates of c. 130 snubfin dolphins at Roebuck Bay and c. 160 bottlenose dolphins at Beagle Bay were obtained, suggesting particularly favourable habitat to these species.
- Many individuals were resighted across multiple years, with snubfin dolphins at Cygnet Bay and Roebuck Bay both showing evidence of strong site fidelity.

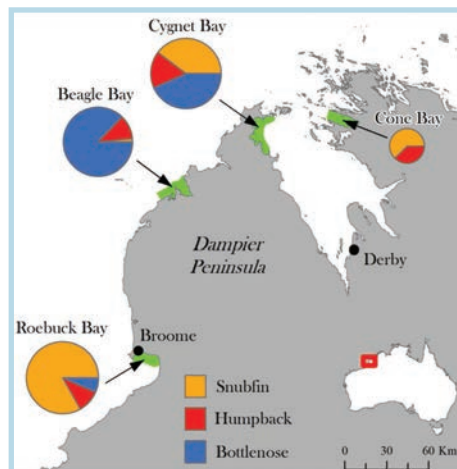


FIGURE 3 The relative proportions of photo-identified individuals of each species at study sites in the western Kimberley. Pie charts are scaled according to the number of individuals identified at each site. Only one humpback dolphin was identified in the eastern Kimberley site of the Inner Cambridge (not pictured)



A snubfin dolphin surfaces in Roebuck Bay. Results showed that these waters off the town of Broome support one of the highest concentrations of snubfin dolphins reported to date. (Photo: Alex Brown, MUCRU/WWF-Australia)

These findings highlight the need for site-specific data collection on inshore dolphins. Without such data, the importance of a location to a specific species can be under- or over-estimated, and the potential impacts of threatening activities may be inappropriately assessed. At low population sizes, these long-lived, late-maturing species are particularly vulnerable to declines, making it essential that threatening processes are identified and managed.

Our results provide important data on the occurrence of inshore dolphins in this region, which can inform future research, conservation efforts, environmental impact assessments and the development of management plans for relevant Marine Parks. We highlight the abundance of snubfin dolphins in Roebuck Bay as an ideal candidate site for longer-term studies of this species, which will be necessary in order to better understand threatening processes, trends in abundance, habitat use and their influencing factors. ■

More information

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References

- 1 Brown, A.M., Bejder, L., Pollock, K.H. and Allen, S.J. (2016). Site-specific assessments of the abundance of three inshore dolphin species to inform conservation and management. *Frontiers in Marine Science* 3:4. doi: 10.3389/fmars.2016.00004

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