## Flying in circles: Abundance estimation of dolphins using distance sampling

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Population status for tropical dolphins in north Western Australia is unknown across most of their range. We used broad-scale manned aerial surveys to estimate abundance of three dolphin species in the Pilbara region of Western Australia. In 2015 the survey design included transects 5 km apart and extending offshore to the 20 m depth contour. We used a circle-back protocol, breaking from transect when a dolphin group was sighted, to confirm species identity and group size for groups > 5 individuals. We estimated minimum abundance of bottlenose dolphins (*Tursiops aduncus*) over an 18,950 km$^2$ survey area at 2,846 (CI 1549-5230) uncorrected for availability bias. The best distance sampling model included the factors distance, time of day, observer fatigue, glare angle, group size and group size/observer fatigue interaction. There were too few sightings of humpback dolphins (*Sousa sahulensis*) in the 2015 survey to estimate abundance and no snubfin dolphins were sighted. In 2016 we adapted the survey design to increase sampling intensity and survey effort where humpback dolphins had been sighted previously. In 2016 we recorded adequate sightings to produce a minimum abundance estimate of 273 (CI 184-405) for humpback dolphins over the 9,050 km$^2$ surveyed area. The best model for humpback dolphins included the factors distance, time of day, observer fatigue and group size. The few sightings of snubfin dolphins in 2016 precluded a population estimate of this species but future research will assess the viability and fidelity of this potential population through targeted boat-based surveys in the Exmouth Gulf.


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# ABSTRACT BOOK