



Geographical and seasonal distribution of pygmy right whales (*Caperea marginata*) in Australia

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ABSTRACT

Passive acoustic monitoring was conducted across Southern Australian waters (south of 27° S) to investigate the geographical and seasonal distribution of the elusive pygmy right whale (*Caperea marginata*). We developed a deep-learning detector trained on spectrograms of PRW "doublet" vocalisations, validated by manual review, and applied it to 26 recording sites spanning the Great Australian Bight and adjacent eastern and western coasts. Seasonal patterns differed markedly between regions: on the western shelf, detections consistently peaked between July and November (with an anomalous early season in March-June 2012), whereas eastern waters exhibited more dispersed year-round call presence, with pronounced peaks in 2012 (July-October), 2015 (March, May-June, August, November-December), 2016 (June-November), and 2017 (February). Co-occurrence analysis of doublet and "spot" calls across 16 datasets revealed synchronized gaps and peaks, supporting the hypothesis that both call types originate from the same species. Our findings underscore region-specific habitat use and seasonal migration of pygmy right whales and highlight the value of automated acoustic techniques combined with ecological context for monitoring cryptic cetaceans in data-limited environments.