
Seabirds on islands: unraveling drivers of spatial distribution for breeding seabird populations on New-Caledonia islets

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Abstract

New Caledonia is a "French" archipelago in the Western Pacific comprising dozens of islands and > 600 islets and is home to at least 23 breeding seabird species. The New Caledonian EEZ also contains the fourth largest Marine Protected Area, the Natural Park of the Coral Sea (1,292,967 km²), which encompass several remote islet groups such as d'Entrecasteaux reefs and the Chesterfield archipelago. Despite long-term efforts in ornithological monitoring and several eradication campaigns targeting invasive mammals, drivers of breeding seabird communities and population abundance are yet poorly known. We aggregated data from 105 ornithological surveys (1958-2019) on 92 islets spread across New Caledonian waters to produce a local assessment of the community distribution of nesting seabirds. We then tested the effects of anthropogenic (invasive species, harbor distance, visitation) and non-anthropogenic (habitat characteristics) drivers on site-wise abundance and species richness. Finally, we used our results to evaluate the impact of past eradication campaigns on seabird distribution, discuss the relevance of extant conservation measures and identify sites that should be prioritized for future research and management. Overall, we found species richness and bird abundance to be strongly correlated with the distance to nearest harbor, with the most remote islets concentrating the largest and most diverse colonies. We also observed significant interspecific variation of breeding ranges (distance from harbor at which breeding occurs), that may account for differences regarding the tolerance to human presence and visitation. Our analyses were partly limited by data heterogeneity due to uneven islet coverage and the variety of survey methods used, and thus did not include temporal trends. To the best of our knowledge, this is the first attempt to identify drivers of breeding seabird distribution on islets covering most of the New Caledonian waters. Our findings highlight the importance of near-pristine sites for seabird breeding and emphasize

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the need for more comprehensive, fine-tuned conservation policies for maintaining breeding populations. Future developments include the addition of more study sites (Loyalty islands, Remote Eastern islands) and large-scale comparisons with other important seabird breeding locations in the Indo-Pacific area.

Keywords: island ecology, New Caledonia, seabirds, spatial distribution, conservation