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TEMPORAL AND SPATIAL SCALES OF FORAGING INFLUENCE BY LAND-BASED BREEDING PREDATORS FROM HEARD ISLAND

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The extent of predatory influence exerted by a population of animals on a marine ecosystem depends substantially on a combination of the diversity and amount of biomass consumed and the patterns in time and space of that consumption. While our understanding of the foraging ecology of land-based marine predators has advanced enormously in the past few decades, studies have often been limited in sample size and focusing on single species. The heterogeneity of foraging behaviour reported highlights the need for simultaneous, multi-species studies with sample sizes that can deliver sufficient power to at least begin to model their regional influence. Such a study was conducted during the austral summer of 2003/04 around the subantarctic Heard Island, with a particular focus on the meso-pelagic predator-prey relationships. Macaroni penguins, king penguins and Antarctic fur seals were studied as they are the region's dominant meso-pelagic consumers. Two albatross species were also studied as they forage at different scales and are subject to fishery bycatch. Four dimensional foraging space and diet were measured intensively for a 40day period during which a ship-based component of the experiment measured the region's physical and biological characteristics. Spatial separation of foraging grounds was marked and scales varied within and between species during the study period. Foraging influence was exerted in partitioned, near-shore, relatively shallow waters, through to off-shore abyssal zones and as far away as the Antarctic continental shelf-break. These foraging parameters are now being determined for implementation in a novel ecosystem model for use in developing ecologically sustainable fishing practices in the region.