

Expansion of *Ardenna* shearwater breeding colonies on Broughton Island after eradication of the European Rabbit and Black Rat

¹Nicholas Carlile, ²Susanne Callaghan and ³Mary Garrard

¹Department of Planning, Industry and Environment, Locked Bag 5022, Parramatta New South Wales 2124, Australia.
Email: Nicholas.Carlile@environment.nsw.gov.au

²National Parks and Wildlife Service, Locked Bag 99, Nelson Bay, New South Wales 2315, Australia

³School of Environmental and Rural Science, University of New England, Armidale, New South Wales 2351, Australia

Received: 14 December 2021

Accepted: 4 April 2022

Broughton Island, offshore from Port Stephens, New South Wales is one of the few sites off the Australian east coast where population estimates of shearwaters, using repeatable survey techniques, have been undertaken over an extended period. The most recent survey was undertaken in 2018, almost a decade after the total removal of invasive vertebrates. It was expected that, in line with previous comparable surveys, both the area of occurrence and the estimated breeding numbers of shearwaters would have increased after this removal. From the GPS-delineated area of 31 sub-colonies where transect counts of burrows were made, combined with direct counts at additional small sub-colonies, it was estimated that the breeding area of shearwaters on the island had increased by 31% since 2009. However, the estimated number of breeding pairs had only increased over this period by 11%, as burrow densities had declined. The small increase in breeding area was lower than that recorded in the last comparison made between 1977 and 2009. The burrow density declines were surprising, as the occurrence of the dominant species, the Wedge-tailed Shearwater *Ardenna pacifica*, has been increasing in southern New South Wales since the late 1960s and it has recently expanded its breeding range into Victorian coastal areas. When the relatively low rate of population growth and decreases in burrow density on Broughton Island are viewed in relation to changes in population estimates of shearwater numbers on other east coast islands, it seems likely that off-island factors, such as changes in access to and quality of suitable prey species, may have contributed to these trends.

Keywords: Broughton Island; shearwater; breeding area; burrow density; population expansion; rabbits and rats.