

## SEABIRD ISLANDS

## No. 20/1

## North Rock, Broughton Group, New South Wales

**Location:** 32°36'S, 152°19'E. Located approximately 17 kilometres north-east of the entrance to Port Stephens, New South Wales (NSW). It is part of the Broughton Group, situated approximately 1300 metres north of Broughton Island.

**Status:** Together with nearby Inner Rock, forms Stormpetrel Nature Reserve, gazetted in 1976 for the conservation of seabird nesting habitat. It is part of the Myall Coast Reserves administered by NSW National Parks and Wildlife Service, Office of Environment and Heritage.

**Description:** North Rock is an irregular-shaped island measuring 260 metres by 130 metres, aligned east–west along its longest axis. It is 2.4 hectares in area, of which 1.0 hectare is vegetated. The island is composed of Carboniferous volcanic rhyolite with basalt intrusions, and has a rocky shoreline. A plateau, reaching 23 metres in height, slopes gently to the west; elsewhere it is surrounded by cliffs. A sand-spit at the western end of the island terminates to the south-west in a small sandy beach amongst rock outcrops. Vegetation is dominated by Spiny-headed Mat-rush *Lomandra longifolia*, with a stand of Tuckeroo *Cupaniopsis anacardioides* at the summit. Other species not mentioned by Lane<sup>1</sup> and including exotic (\*) species are:

*Asplenium bulbiferum*, *Histiopteris incisa*, *Hydrocotyle peduncularis*, *Diplazium australe*, *Lepidium* sp., *Atriplex*

*cinerea*, *Monotoca elliptica*, *Acacia longifolia* ssp. *sophorae*, *Duboisia myoporoides*, *Oxalis perennans*, *Wikstroemia indica*, *Bromus* sp., *Sporobolus virginicus*, \**Chrysanthemoides monilifera*, \**Rumex* sp., \**Conyza* sp., \**Solanum nigrum* and \**Phytolacca octandra*.

**Landing:** Onto beaches or rocks at the western end and, depending on prevailing conditions, rocks at the eastern end of the island.

**Ornithological History:** In December 1973, Lane and others found Wedge-tailed Shearwaters *Ardenna pacifica* and White-faced Storm-petrels *Pelagodroma marina* breeding, and evidence of Little Penguins *Eudyptula minor* recently occupying burrows<sup>1</sup>. Dodkin (NPWS) recorded a Little Penguin ashore in a burrow in February 1974<sup>1</sup>. Priddel and others landed for an hour on 3 April 1998 and searched unsuccessfully for evidence of Gould's Petrels *Pterodroma leucoptera*, but found the remains of a Fluttering Shearwater *Puffinus gavia* amongst a stand of Tuckeroo near the summit. Carlile, Priddel and others visited overnight on 23–24 September and 21–22 October 1999 to survey seabirds and search for further evidence of Fluttering Shearwaters. Callaghan and others visited overnight on 2–3 October and 21–22 December 2010 to search for penguins and to survey shearwaters and storm-petrels.

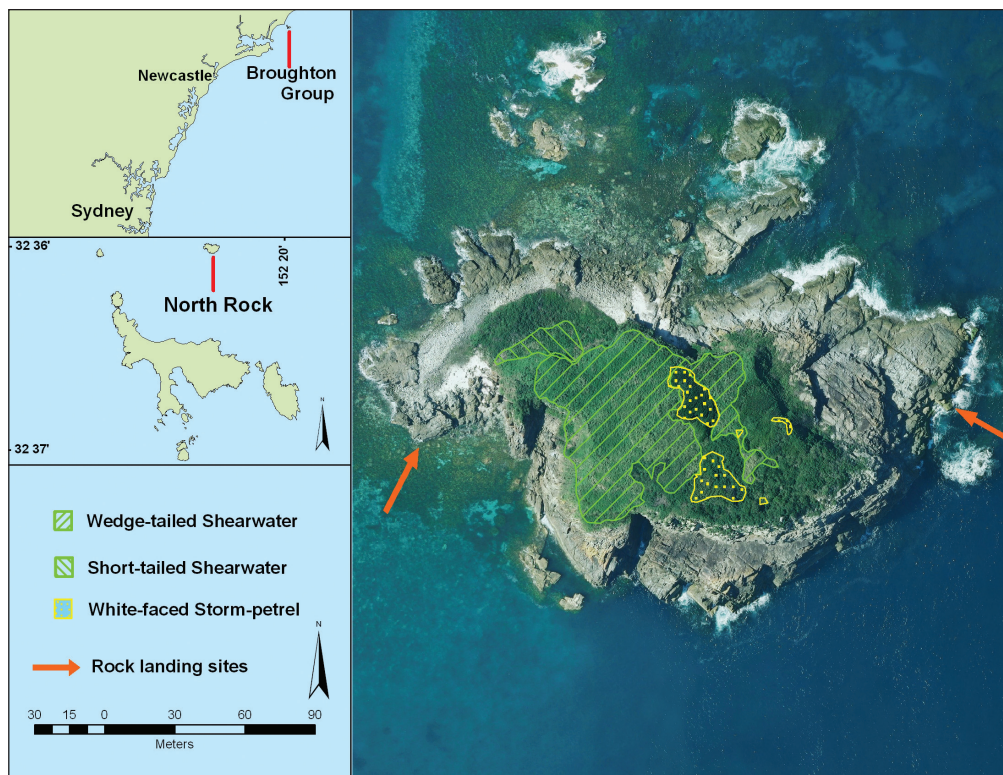


Figure 1. North Rock, Broughton Group, New South Wales

### Breeding Seabirds and Status

*Pelagodroma marina* White-faced Storm-petrels—Previously recorded nesting in shallow soils under shrubs and among Wedge-tailed Shearwater burrows<sup>1</sup>, but now absent from the shearwater colony. In October 1999, colonies were located within two areas of the plateau covered by shrubs. A quadrat (10 x 10 m) in each area together recorded 55 burrows at a density ( $\pm$  s.e) of 0.28 ( $\pm$  0.19) burrows per square metre. In December 2010, these two same colonies covered a combined area of 601 square metres and contained 219 burrows at a mean density of 0.36  $\pm$  0.19 burrows per square metre, similar to that recorded a decade earlier. An additional three small colonies were identified, containing 29 burrows in total. Young chicks were found in some of the burrows examined. Although many adults were seen over-flying the island during the evening of 2 October 2010, no adult storm-petrels were seen during one hour of spotlighting (2030–2130 hrs) in December 2010. Based on an occupancy rate of 61 percent<sup>2</sup>, a population of 151 breeding pairs was estimated for the island. This is significantly less than the previous estimate of 1000+ pairs made by Lane<sup>1</sup>, suggesting the population may have declined.

*Ardenna pacifica* Wedge-tailed Shearwater – Nests in all vegetated areas of the island that lack shrub canopy. In October 1999, burrows were counted within two quadrats (10 x 10 m) on the western slope leading to the summit. A total of 35 burrows were counted, giving an estimate ( $\pm$  s.e) of 0.18 ( $\pm$  0.15) burrows per square metre. In December 2010, the boundaries of the colony were mapped using a GPS and geographic information system (GIS). Systematically spaced transects ( $n = 5$ ; 4 m wide and 20–30 m long) were used to sample the colony. The total area surveyed was approximately 12 percent of the colony. A total of 159 burrows were counted, at a mean density ( $\pm$  s.e) of 0.32  $\pm$  0.10 burrows per square metre (range 0.16–0.71). The number of breeding pairs was calculated as the multiple of mean burrow density, area of the colony and occupancy rate. Due to time constraints an occupancy rate was not estimated directly but was assumed to be similar to that in other shearwater colonies (typically 43–56%)<sup>3,4,5</sup>. Assuming an occupancy rate of 50 percent, the population of Wedge-tailed Shearwaters on North Rock was estimated to be 675 pairs ( $\pm$  215). This is marginally less than the previous estimate of 1000+ pairs<sup>1</sup> made using undisclosed methods.

*Ardenna tenuirostris* Short-tailed Shearwater – Nocturnal observations in October 1999 and October 2010 found no evidence of this species. However, *en route* to the summit on the evening of 21 December 2010, occasional calls were heard from an area (345 m<sup>2</sup>) of Mat-rush covered in Dusky Coral-pea *Kennedia rubicunda* at the western end of the plateau. Two transects (each 20 x 4 m) contained 11 empty burrows as well as two adult Short-tailed Shearwaters incubating eggs. The population on the island probably does not exceed 10 pairs. This species had not been recorded breeding on this island previously.

*Eudyptula minor* Little Penguin – No evidence of this species ashore was found during the recent surveys (1999 and 2010). In September 1999, we conducted hourly searches of the island and shoreline between sunset and 0200 hours, and again from

0430 hours until dawn. During this and all subsequent visits, we searched potential nesting areas among rocks and vegetation, without success. In October 2010, we observed no birds visiting the island (one hour nocturnal searching) and found no evidence (excrement trails) of penguin landing or loafing sites. In December 2010 there was no detection of activity. Although Lane<sup>1</sup> suggested that a few penguins might breed on the island, this has never been confirmed.

*Chroicocephalus novaehollandiae* Silver Gull—Although present on the island during recent surveys, there was no evidence that it nested there. Lane<sup>1</sup> suggested 20 pairs were breeding on the island in December 1973 but no details were given.

### Factors Affecting Status

As with all other islands in the Broughton Group, seabirds on North Rock are subject to predation by White-bellied Sea-eagle *Haliaeetus leucogaster* and Swamp Harrier *Circus approximans*.

The possible decline of White-faced Storm-petrel since 1973 may be due to a loss of burrowing habitat as they no longer nest within the colonies of Wedge-tailed Shearwater, despite no evidence that shearwater numbers have increased. However, shearwater colonies on nearby Broughton and Little Broughton islands have increased substantially over the past four decades<sup>6,7</sup> and, if the original population estimate on North Rock was an overestimate, a similar expansion here may have been detrimental to the storm-petrel population. Removal of Black Rats *Rattus rattus* from other islands within the Broughton Group<sup>8</sup> will facilitate the expansion of White-faced Storm-petrels from North Rock onto other islands within the Group.

As Lane<sup>1</sup> made no mention of it, Bitou Bush *Chrysanthemoides monilifera* appears to have established on North Rock since 1973. This invasive species, along with Prickly Pear *Opuntia stricta*, will require ongoing management if it is to be contained. The Bitou Bush, if allowed to dominate the vegetation, will be to the detriment of the larger shearwaters, and the Prickly Pear could potentially impale the smaller storm-petrels on its spines.

### Other Seabirds Recorded

The remains of a Fluttering Shearwater were found in 1998, but extensive searches since have failed to find any further evidence of this species. Sooty Oystercatcher *Haematopus fuliginosus* was recorded on the island during the recent surveys.

### Other Vertebrates Recorded

Yellow-bellied Water-skink *Eulamprus heatwolei* was recorded during the 1999 and 2010 surveys.

### Banding

First banding – 10 December 1973

*Pelagodroma marina* – 1 adult and 4 nestlings, with no recoveries.

*Ardenna pacifica* – 34 adults, with no recoveries.

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*Nicholas Carlile and David Priddel, Office of Environment and Heritage, PO Box 1967, Hurstville BC, New South Wales 1481, Australia.*

*Susanne Callaghan, Office of Environment and Heritage, Locked bag 99, Nelson Bay, New South Wales 2315, Australia.*

Email: [Nicholas.Carlile@environment.nsw.gov.au](mailto:Nicholas.Carlile@environment.nsw.gov.au)