

## SEABIRD ISLANDS

## No. 256

## Roach Island, Lord Howe Group, New South Wales

**Location:** 31°29'57"S, 159°04'07"E; 1100 metres north of Lord Howe Island, 580 kilometres east of Port Macquarie, New South Wales, in the South Pacific Ocean. Roach Island is one of a group of islands to the north of Lord Howe Island known as the Admiralty Islands, which also includes Tenth of June Island, South Island, Noddy Island, Sugarloaf Island and North Rock.

**Status:** The entire Lord Howe Group is inscribed on the World Heritage List. Roach Island is part of the Permanent Park Preserve administered by the Lord Howe Island Board. Permission from the Board is required to land on the island.

**Description:** Roach Island (14.5 ha) is the largest of the Admiralty Islands. It is aligned north-west to south-east with a north-east spur. An elevated area of 11.9 hectares rises to 84 metres at the western extremity of the island, and includes a sloping plateau of 6.2 hectares where there are areas of deep soil. The island is composed mostly of tuff dissected by basalt dykes, one of which has eroded into a sea-tunnel that undercuts the island at its narrowest point. The eastern slopes are precipitous and rocky, whereas the western slopes are less steep and contain areas of soil.

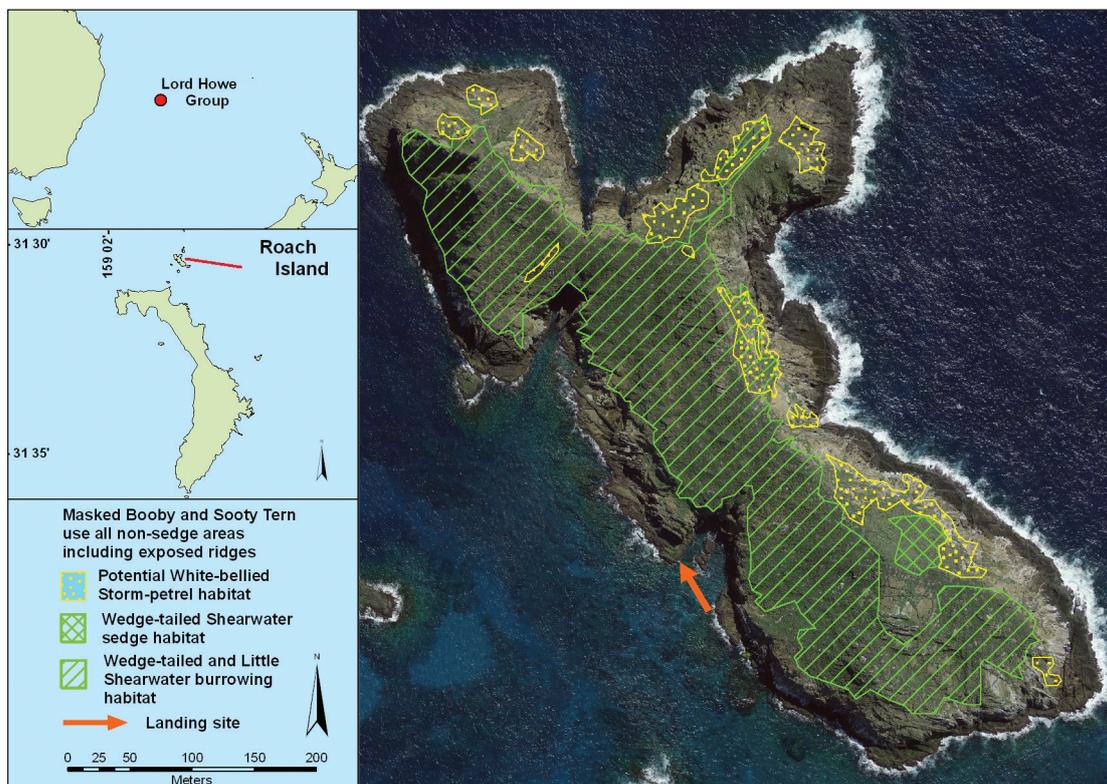
The vegetation is dominated by Coast Tussock-grass *Poa poiformis* and extensive areas of scrambling Native Wandering Jew *Commelina cyanea*, with a large patch (1500 m<sup>2</sup>) of Leafy

Flat Sedge *Cyperus lucidus* on the southern end of the main ridge. Shrubs of Sallywood *Lagunaria patersonia*, Tea-tree *Melaleuca howeana*, Boobialla *Myoporum insulare* and Grey Bark *Drypetes deplanchei* occur below the protected ridges that fall away to the north, and grow as stunted individuals elsewhere on steep slopes. Other vegetation, including exotic (\*) species, comprised:

*Achyranthes aspera*, *Carpobrotus glaucescens*, *Coprosma prisca*, *Lepidium howei-insulae*, \**Polycarpon tetraphyllum*, \**Portulaca oleracea*, *Senecio howeanus*, *Tetragonia tetragonioides*, \**Digitaria sanguinalis*, *Sporobolus virginicus*, \**Ipomoea cairica*, *Jasminum didymum* and *Parsonsia howeana*.

**Landing:** In favourable seas onto rocks within an eroded dyke approximately midway along the western shore.

**Ornithological History:** The first recorded visit by an ornithologist was from Hull<sup>1</sup> on 16 October 1907 to collect seabird eggs. Eighteen Little Shearwaters *Puffinus assimilis* were collected by Bell<sup>2</sup> on 24 June 1914. The Australian Museum landed a team in 1922 to collect specimens, images and information for a permanent seabird display in Sydney<sup>3</sup>. Hindwood<sup>2</sup> visited for observations on 14 November 1936. McKean and others commenced banding birds there on 22 November 1959<sup>4</sup>, and revisited in November 1962 and on 15



• Roach Island, Lord Howe Group, NSW.



• Roach Island from the south.

September 1963. Dorward landed on 23 June 1963 to study the Masked Booby *Sula dactylatra*<sup>4</sup>. Fullagar and others were the first ornithologists to stay on the island overnight, on 23–24 February and 2–4 March 1971<sup>5</sup>. They recorded the species present, estimated population sizes and banded birds. Records of the Australian Bird and Bat Banding Scheme (ABBBS) identify additional visits for which there are no published records: Hitchcock in February 1961, Rogers in December 1968, Disney in November 1969, Shick in September 1973, Fullagar and Shick in February 1974, Miller in March 1979 and April 1980, Bateman in October 1979, Beaumont in December 1980 and January, February and April 1981, and Hutton in April 1994 and December 2001. During a day visit in October 2001, O'Neill<sup>6</sup> estimated the number of incubating Sooty Terns *Onychoprion fuscatus*. Roach Island has been visited seasonally by locals since early settlement to harvest seabird eggs and shearwater fledglings. A single person could collect as many as 2400 Sooty Tern eggs in a single day<sup>6</sup>. Harvesting of eggs and chicks declined during the latter half of last century and is now prohibited.

Carlile and Bower led a survey team that visited the island on 14–15 December 2009 (6 persons), 21–22 February 2010 (4 persons), 18–20 May 2010 (2 persons), and 17 August 2011 (2 persons). The findings of these surveys are described below.

### Breeding Seabirds and Status

*Phaethon rubricauda* Red-tailed Tropicbird—On Roach Island, this species nests on cliffs that are largely inaccessible, consequently estimating breeding numbers is problematic. In February 2010, parents returning to feed nestlings were counted from four vantage points along the main ridge. Each count lasted five minutes and was repeated on three occasions. The total number of nest sites visited by adult birds was seven. This is likely to be an underestimate as not all cliff-faces could be scanned. No previous count of this species on Roach Island has been undertaken.

*Fregatta grallaria* White-bellied Storm-petrel—This species is restricted to rock cavities that are too small to be used by any of the larger Procellariiformes, either among rock piles or in eroding basalt dykes and other rock layers. Nocturnal surveys, comprising 10-minute periods of searching with a spotlight interspersed with five minutes of listening in darkness, were

conducted in December 2009 (2 hours) and February 2010 (1 hour). A total of 25 and 20 White-bellied Storm-petrels, respectively, were seen. In February 2010, seven nests with adults on eggs were located within a defined search area (1350 m<sup>2</sup>) of rocky habitat. Extrapolation of the observed density of nests (0.0052 per m<sup>2</sup>) over the entire expanse of potential rocky habitat (8195 m<sup>2</sup>) gave an island-wide estimated of 43 nests. Searches of all additional dykes and isolated rock piles located six more incubating individuals, giving a total population in February 2010 of 49 pairs for the island. In 1971, Fullagar<sup>5</sup> located 12 nests over three nights but estimated the total population for the island to be more than 1000 pairs. The two different estimates suggest a severe decline between 1971 and 2010. However, the availability of suitable breeding habitat on Roach Island is severely limited, and it is likely that the earlier estimate was overly optimistic and that the population of White-bellied Storm-petrels on Roach Island has always been small.

*Ardenna pacifica* Wedge-tailed Shearwater—Although mostly on the plateau, this species nests over much of the island, either in short burrows, rock cavities, excavated alcoves that provide only minimal protection from the elements, or in the open between clumps of vegetation. In December 2009, the plateau was surveyed for nesting birds. Nine transects (each 50 x 4 m) indicated a density ( $\pm$  s.d.) of 0.25 ( $\pm$  0.11) birds per square metre. A single transect (30 x 4 m) within an area on the plateau dominated by sedge (1459 m<sup>2</sup>) recorded a much higher density (0.43 birds per m<sup>2</sup>), with both surface and sub-surface nesting. Together these observed densities indicate a population of 15 735 ( $\pm$  6705) pairs on the plateau. No count of nesting birds was made outside the plateau on the steeper rocky slopes (3.5 ha) because the terrain here was unsafe to traverse. General observations by Fullagar and others in 1971<sup>5</sup> suggested the population to be 12 500 pairs, although no systematic surveys were conducted. Together, these two estimates suggest that the size of the population of Wedge-tailed Shearwater on Roach Island has changed little during the last 40 years.

*Puffinus assimilis* Little Shearwater—This species is restricted to the plateau, in rocky areas outside the area of sedge. They nest mostly in rock crevices that are inaccessible to Wedge-tailed Shearwater, which arrive to begin breeding when the Little Shearwater is still provisioning nestlings. Little Shearwaters were recorded on the ground at night in February 2010. In May, individuals were found in deep soil burrows on the plateau where Wedge-tailed Shearwaters nest, but there was no subsequent evidence that they bred there successfully. In August 2011, a survey of the plateau using transects (50 x 4 m,  $n = 6$ ) found a density ( $\pm$  s.d.) of 0.018 ( $\pm$  0.007) birds per square metre. We estimate the population for the island to be 1053 pairs ( $\pm$  415). In 1971, a 'rough estimate' by Fullagar<sup>5</sup> was 4000 pairs, but because of the limited extent of habitat it is unlikely that there were ever this many.

*Pterodroma nigripennis* Black-winged Petrel—In February 2010, two pairs were observed engaged in aerial courtship, and two individuals were seen leaving the island during daylight. Both departing birds ruffled their feathers extensively while lifting off from the ground, suggesting they may have been nesting, but no nests were found. The population on Lord Howe Island is expanding and this species may now be colonising Roach Island, as they have not been recorded here previously<sup>7</sup>.



• Roach Island from the east. Viewed from the summit of Tenth of June Island. The North Hills of Lord Howe Island are in the middle background and Mount Gower and Mount Lidgbird are on the far left. Post-image processing by Eric Woehler

*Sula dactylatra* Masked Booby—This species nests on open, flat areas, predominantly on the ridges and west- and south-facing slopes. In December 2009, we counted 284 active nests. The Masked Booby has a protracted breeding season with laying documented from May<sup>8</sup> to January<sup>9</sup>. Weekly data on the number of active nests from a previous study of Masked Booby on Lord Howe Island<sup>8</sup> was used to determine the proportion of the total nests present during the breeding season. At the time of the December survey 11.5 percent of the total nests were remaining from the season. We estimate from this that approximately 2500 pairs may have bred on Roach Island in 2009/10. Fullagar and others estimated that hundreds of Masked Booby were nesting or roosting on this island in February 1971<sup>5</sup>, toward the end of the breeding season<sup>8</sup>. Without a more accurate estimate of the numbers of nests, it is not possible to determine how the population has changed over the past 40 or so years.

*Anous stolidus* Common Noddy—In December 2009 and February 2010 this species was nesting on shrubs scattered across the western slopes and cliffs of Roach Island. The precipitous nature of this habitat precluded an accurate assessment of their population. From the number of nests seen and the extent of nesting habitat, we estimated that 10–100 pairs may have bred on the island. In 1940, Hindwood<sup>2</sup>, estimated there to be 100 breeding pairs.

*Procelsterna cerulea* Grey Ternlet—The breeding season for this species had concluded before the December 2009 survey and only a few adult birds and the occasional fledgling were observed.

*Onychoprion fuscatus* Sooty Tern—This was the most widespread and abundant species breeding on Roach Island. In December 2009, six quadrats (each 20 x 20 m) were laid out on the plateau where there was a high density of nests containing young aged from downy pullus to near-fledged chicks. Ten minutes later, after parents and chicks had resumed their territorial positions, all live chicks were counted by walking through the quadrat faster than the ‘runners’ could disperse. The mean density of

chicks ( $\pm$  s.d.) was 0.22 ( $\pm$  0.07) per square metre, or a total of 13 538 ( $\pm$  4070) individuals on the plateau. No count of nesting birds was made outside the plateau on the rocky slopes because the terrain here was unsafe to traverse.

In 1936, Hindwood<sup>2</sup> reported that Sooty Terns nested over half the elevated portion of the island at a ‘liberal estimate’ of one pair per square yard, giving an approximate population of 50 000 pairs. Such high nesting densities were neither recorded during our survey nor during surveys of this species on Lord Howe Island<sup>6</sup>, and are likely to be an overestimate. O’Neill<sup>6</sup> surveyed the plateau of Roach Island during the incubation period in 2001 and recorded densities of 0.35 ( $\pm$  0.27) birds per square metre, from which she estimated a breeding population of 21 800 ( $\pm$  16 450) pairs. This was substantially higher than our estimate, but would have included eggs lost prior to hatching, which we were too late to census.

### Factors Affecting Status

Human trampling could have significant impact on burrowing species due to the fragility of the skeletal soils on Roach Island. Tourism, although permitted under licence, is very limited due to the difficulty of access and the need for calm sea conditions to allow safe landings. Visits to conduct scientific studies occur infrequently, but inappropriate burrow disturbance can lead to problems, as any small burrow or cavity that is inadvertently enlarged will be no longer suitable for use by the smaller species such as White-bellied Storm-Petrel due to competition from larger species.

Buff-banded Rails *Gallirallus philippensis* were breeding on the island in 2011 but there was no evidence of widespread damage and their impact may not extend beyond scavenging abandoned eggs. Predation of near-fledged Wedge-tailed Shearwaters by a single migratory Swamp Harrier *Circus approximans* (possibly subspecies *gouldi* from New Zealand) occurs annually from March to May (D. Hiscox, pers. comm.) but its impact on the shearwater population is likely to be negligible.

### Other Seabirds Recorded

A cumulative period of six hours of spotlighting over three visits recorded two pairs of Providence Petrels *Pterodroma solandri* (in May 2010), but no other additional species.

### Other Vertebrates Recorded

Both the Lord Howe Island Skink *Oligosoma lichenigera* and Lord Howe Island Gecko *Christinus guentheri* were present on Roach Island. Peanut-flavoured Waxtags (Pest Control Research Ltd, Christchurch, New Zealand) deployed between December 2009 and May 2010 did not indicate the presence of rodents. Similarly, there was no evidence that the Grass Skink *Lampropholis delicata* or Bleating Tree Frog *Litoria dentata*, now present on Lord Howe Island, have established on Roach Island. No microchiropteran activity was noted during any of the nocturnal spotlighting, nor during an overnight audio survey using an Anabat™ detector in December 2009<sup>10</sup>.

### Banding

Data for all banding records (first banding 22 November 1959):

*Phaethon rubricauda*—Two adults and three nestlings with no recoveries.

*Fregatta grallaria*—54 adults and two nestlings with no recoveries.

*Ardena pacifica*—95 adults with no recoveries.

*Puffinus assimilis*—168 adults with no recoveries.

*Sula dactylatra*—121 adults and 89 nestlings with 11 recoveries at or near the banding place and four away: Valla Beach, New South Wales, 587 kilometres and 15 months later; North Stradbroke Island, Queensland, 706 kilometres and 10 years later; Moindou, New Caledonia, 1235 kilometres and 13 months later; and Little Boydong Cay, Queensland, 2767 kilometres and 7 months later.

*Anous stolidus*—15 adults and nine nestlings with no recoveries.

*Procelsterna cerulea*—two nestlings with no recoveries.

*Onychoprion fuscata*—602 adults and 4534 nestlings with 17 recoveries at or near the banding place and four away: Tea Gardens, New South Wales, 663 kilometres and three months later; North Stradbroke Island, Queensland, 709 kilometres and one month later; Maroochydore, Queensland, 791 kilometres and one month later; and Wawa Strait Leyte, Philippines, 5900 kilometres and four years later.

### Bibliography

1. Hull, A.F.B. (1910). The birds of Lord Howe and Norfolk Islands. *Proceedings of the Linnaean Society of New South Wales for the year 1909* **34**: 636–693.
2. Hindwood, K.A. (1940). The birds of Lord Howe Island. *Emu* **40**: 1–86.
3. McCulloch, A.R. (1923). A nesting colony of sea birds on the Admiralty Rocks at Lord Howe Island. *Australian Museum Magazine* **1**: 257–259.

4. McKean, J.L. and Hindwood, K.A. (1965). Additional notes on the birds of Lord Howe Island. *Emu* **64**: 78–97.
5. Fullagar, P.J., McKean, J.L. and van Tets, G.F. (1974). Appendix F. Report on the birds. In 'Environmental survey of Lord Howe Island: A report to the Lord Howe Island Board' (Ed. H.F. Recher). Pp 55–72. (Australian Museum: Sydney).
6. O'Neill, L.E. (2006). The breeding and feeding ecology of the Sooty Tern, *Sterna fuscata* on Lord Howe Island. PhD thesis, Charles Sturt University, Albury.
7. McAllan, I.A.W., Curtis, B.R., Hutton, I. and Cooper, R.M. (2004). The birds of the Lord Howe Island Group: A review of records. *Australian Field Ornithology supplement*. **21**: 1–82.
8. Priddel, D., Hutton, I., Olson, S. and Wheeler, R. (2005). Breeding biology of Masked Boobies (*Sula dactylatra tasmani*) on Lord Howe Island, Australia. *Emu* **105**: 105–113.
9. Hutton, I. (1991). 'Birds of Lord Howe Island: Past and Present'. (Ian Hutton: Coffs Harbour).
10. Schulz, M. and Carlile, N. (2010). Bat survey of near-shore islands in the Lord Howe Island Group. *The Australasian Bat Society Newsletter* **35**: 48–49.

### Acknowledgements

Surveys of Roach Island would not have been possible without the co-operation and assistance of the Lord Howe Island Board, Lord Howe Island Environmental Tours and BirdLife Australia. Alison Derry, Sarah Jacob, Lisa O'Neill, Chris Powell and Martin Schulz (Australasian Seabird Group) participated in the surveys. Sue Bower (Lord Howe Island Board) provided details of the vegetation of the island and, along with Ian Hutton, participated in the 2009 survey. The ABBBS provided data pertaining to banding and recovery records. The surveys were funded by the Commonwealth Government Threatened Species Recovery Implementation Program.

Date compiled: 26 August 2011.

Nicholas Carlile and David Priddel, Office of Environment and Heritage, PO Box 1967, Hurstville, New South Wales 2220, Australia.

Hank Bower, Lord Howe Island Board, PO Box 5, Lord Howe Island, New South Wales 2898, Australia.

Email: Nicholas.Carlile@environment.nsw.gov.au