

SEABIRD ISLANDS

No. 22/1

Boondelbah Island, New South Wales

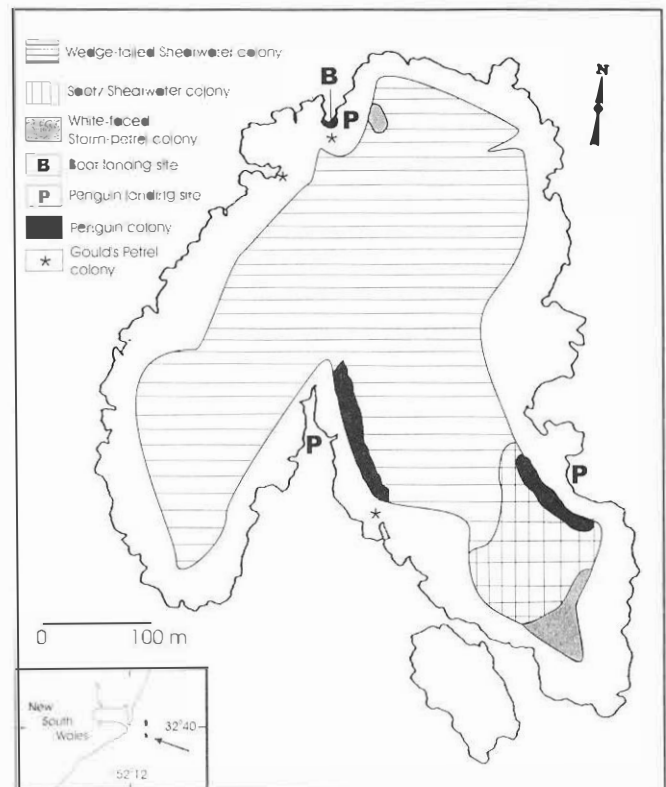
Location: 32°42'S, 152°14'E: Four kilometres east of Tomaree Head, Port Stephens, New South Wales.

Status: Nature Reserve administered by the NSW Department of Environment and Conservation (formerly the NSW National Parks and Wildlife Service (NPWS)). Proposed for nomination as critical habitat for Gould's Petrel *Pterodroma leucoptera leucoptera*⁸. Entry permit required.

Description: Shaped in the form of a mesa, 650 metres by 425 metres, covering 9.3 hectares. Steep cliffs of toscanite rise on all sides to 55 metres above sea level and are highly fractured along vertical bedding planes. Several basaltic dykes dissect the island. The main north-south dyke is heavily eroded at the southern end, forming a deep bay and a natural arch. Siliceous soils on the southern and eastern parts of the island give way to more humic and waterlogged soils in seepage areas. The vegetation in drier areas is dominated by Spiny-headed Mat-rush *Lomandra longifolia*, whereas Knobby Club-rush *Isolepis nodosa* dominates waterlogged sites. Ridges are dominated by the Blue Flax Lily *Dianella caerulea*. Scattered, wind-sheared trees of Deciduous Fig *Ficus superba* var. *henniana*, Tuckeroo *Cupaniopsis anacardioides* and Soft Corkwood *Duboisia myoporoides* occur along ridges, in the central valley and on the north and west cliff faces. Prickly Pear *Opuntia stricta* is widespread on the ridges and western and northern cliffs, and extensive clumps occur within the central valley. Bitou Bush *Chrysanthemoides monilifera* occurs in patches over many parts of the island.

Landing: On a boulder beach in a ravine on the northern end of the island. Can only be attempted in calm conditions. A strenuous, difficult climb up a steep, loose slope is required to reach the plateau. To minimize environmental disturbance to the fragile slope, the use of a caving ladder is advisable for trips involving multiple climbs, or projects involving multiple visits.

Ornithological History: Both Hull and Austin visited in 1910^{4,7}, recording Wedge-tailed Shearwaters *Puffinus pacificus* in 'immense numbers'. Hull belatedly reported taking an egg from under a Gould's Petrel *Pterodroma leucoptera*³, although there is some doubt as to the accuracy of this report⁷. According to Morris, D'Ombra made numerous visits between 1935 and 1974, but specific details are not known⁵. D'Ombra related that White-faced Storm-petrels *Pelagodroma marina* bred on the island, but no Gould's Petrels were found⁵. Morris and others visited three times between 1967 and 1970. They confirmed the observations of earlier visits and also recorded breeding colonies of Little Penguin *Eudyptula minor*, Sooty Shearwater *Puffinus griseus* and Short-tailed Shearwater *P. tenuirostris*^{5,6}. Priddel and Carlile made five visits, including two overnight stays, between 1992 and 1997 to establish that Gould's Petrel bred on the island⁹.



BOONDELBAH ISLAND, N S W

Between March 1998 and April 2000 NPWS staff and volunteers made 13 overnight visits (staying a total of 57 nights) and three one-day visits. The purpose of these visits was to translocate 200 near-fledged Gould's Petrels from Cabbage Tree Island to artificial nest boxes installed in the ravine above the landing site⁸. Numerous subsequent day visits have been made to detect returning birds and to assess the number of nest boxes used. In addition, specific visits to survey seabirds were made on 12–13 October 2002, 22–23 November 2002, 16–17 December 2002 and 27 February 2003.

Breeding Seabirds and Status

Eudyptula minor Little Penguin — Nests were limited to the rocky periphery of shearwater colonies on the southern and south-eastern perimeter of the island and in the northern ravine. Surveys of shearwater burrows revealed that very few penguins nested within the shearwater colonies. Three shoreline landing-points were identified. Counts of birds coming ashore at these landing points between dusk and 2200 hours during November and December recorded a maximum of only 30 birds. The total number of breeding pairs on the island is probably less than 100. This represents a significant decrease since 1976 when Morris estimated there to be more than 1 000 breeding pairs⁵.

Pterodroma leucoptera Gould's Petrel — Originally limited to an unsubstantiated report of a single breeding pair in 1910³. Natural cavities suitable for nesting are uncommon on the island, being restricted to i) rock scree within the northern ravine, ii) a small scree in a narrow ravine on the western shore and iii) a few isolated rock piles on the eastern side of the southern bay. Prior to the installation of artificial nest boxes, Priddle and Carlile estimated the population to be 12 breeding pairs⁹. The first recorded use of a nest box was in December 2000. Thirteen pairs now breed in nest boxes. At least nine of these birds were translocated as fledglings from Cabbage Tree Island, several were originally banded on Cabbage Tree Island but not translocated, and the remainder are of unknown origin (i.e. not previously banded). The number of birds using nest boxes is expected to rise as more translocated fledglings return to breed. Current population on the island is approximately 25 breeding pairs.

Puffinus pacificus Wedge-tailed Shearwater — This species is the most numerous seabird on the island, its nesting habitat (7.2 ha) covering almost 80 per cent of the island. The bird's distribution is unchanged from the late 1960s. Burrows are concentrated in, but not restricted to, the deeper soils of the central valley right up to the cliffs overlooking the southern bay. Burrows also occur in shallower soils at the southern and eastern ends of the island. From counts of burrows within a series of transects (10 transects, each 50 m by 4 m) the total number of shearwater burrows on the island was estimated to be 29 400. Excluding those burrows used by Sooty Shearwaters (see below), and using occupancy rates (49.5%) from studies conducted elsewhere², a population of approximately 13 000 breeding pairs of Wedge-tailed Shearwater was estimated for the island. This suggests a significant increase in the numbers of this species since 1976 when Morris estimated there to be 3 500+ breeding pairs⁵.

Puffinus griseus Sooty Shearwater — Based on nocturnal observations of calling from the ground, this species appears limited to the damper soils on the island. The extent of nesting habitat was estimated to be 0.7 hectares. Transect counts within this habitat gave a mean burrow density of 0.74 burrows per square metre. A random check found Sooty Shearwaters to be present in 64 per cent of occupied burrows (36% were Wedge-tailed Shearwaters). Using occupancy rates (75%) from studies elsewhere¹¹, a population of 2 500 breeding pairs was estimated for the island. This represents a marked increase on the previous estimate of just 10 breeding pairs by Morris in 1976⁵.

Puffinus tenuirostris Short-tailed Shearwater — Despite burrow searches and nocturnal observations to detect vocal individuals during the egg-laying period¹⁰ of this species, no evidence was found of their continued existence on the island. Morris estimated there to be 500+ breeding pairs present in 1976⁵.

Pelagodroma marina White-faced Storm-petrel — Two discrete colonies were located. One colony, as described by Morris⁵, was in shallow soil on the southeastern corner of the island and covered 0.1 hectares. The second, smaller colony covered an area of only 50 square metres and was

concentrated around a rocky outcrop on the western side of the high ground above the northern ravine. There was no evidence of two small colonies found by Morris in 1976⁵. By extrapolation from counts made within 10 quadrats (each 4 m²) we estimated that the south-eastern colony contained 192 burrows. A direct count of the northern colony located 90 burrows. Based on occupancy rates (50%) obtained from the only detailed study of this species¹, a population of 140 breeding pairs was estimated for the island. Morris estimated there to be 100+ breeding pair on the island in 1976⁵. Despite the locations of colonies differing from those found earlier, the population appears relatively stable.

Factors Affecting Status

We observed that heavy rain often caused flooding of shearwater burrows late in the breeding season. At this time many advanced chicks left the safety of their burrow. Forced into the open during daylight hours these chicks were easy prey for Swamp Harriers *Circus approximans* and White-bellied Sea-eagles *Haliaeetus leucogaster*. The remains of several adult Gould's Petrels on the western cliffs showed signs of having been killed or scavenged by Australian Ravens *Corvus coronoides*. Discovery of an ordinance fragment on the island indicated that it had been used for target practice, probably during World War II.

The population of Little Penguin on the island appears to have declined significantly since 1976. Whereas Morris found many penguins among the shearwater colonies⁵ we found very few. Nests were restricted to the coastal margins of shearwater colonies and rocky ravines. No obvious threats were observed to account for this decline other than competition for burrows from the marked increase in numbers of Wedge-tailed Shearwaters and Sooty Shearwaters. Similarly, the complete loss of Short-tailed Shearwaters from Boondelbah Island could not be explained by any land-based threat, and may also be a consequence of increased competition or long-term changes in the marine environment.

As reported by Morris, dense stands of Prickly Pear *Opuntia stricta* occur on the exposed western and northern cliffs and ridges⁵. In 1976, however, only isolated plants were found elsewhere⁵. Nowadays, extensive clumps occur throughout the central valley. To control these clumps and prevent further spread, targeted control may be necessary, including the periodic release of the moth borer *Cactoblastis cactorum*. Larvae of this moth have been introduced to the island on several occasions in the past. Although the moth is still present on the island, periodic reintroduction may be necessary to ensure it is widely distributed and sufficiently abundant to be an effective means of control.

Bitou Bush *Chrysanthemoides monilifera* occurs in patches over many parts of the island and appears to be spreading rapidly. Morris made no mention of this species in 1976⁶, suggesting its establishment and spread is relatively recent. The introduction of biological control agents or aerial spraying may be necessary to control the spread of this weed.

Other Seabirds Recorded

Eastern Reef Egret *Ardea sacra*, Sooty Oystercatcher *Haematopus fuliginosus*, Silver Gull *Larus novaehollandiae*, Great Cormorant *Phalacrocorax carbo* and Crested Tern *Sterna bergii* have all been found onshore.

Other Vertebrates Recorded

Sixteen species of land birds have been observed on Boondelbah Island. There was no evidence of any mammal, but three reptiles and one amphibian were located: Striped Skink *Ctenotus robustus*, Garden Skink *Lampropholis guichenoti*, a blind snake *Anomalopus swainsoni* and Brown-striped Frog *Limnodynastes peronii*.

Banding

First banding visit — 30 December 1967.

<i>Pterodroma leucoptera</i>	— 6 adults; 3 nestlings + 195 translocated fledglings. 3 recoveries at banding place.
<i>Puffinus pacificus</i>	— 131 adults; 2 nestlings. 3 recoveries at banding place and 2 away: 7 km NW at Hawkes Nest and 25 km SW at Stockton Beach.
<i>Puffinus griseus</i>	— 2 adults.
<i>Puffinus tenuirostris</i>	— 14 adults.
<i>Pelagodroma marina</i>	— 19 adults; 2 nestlings.

Bibliography

- Brothers, N. P. (1981). Observations of breeding success in White-faced Storm-petrel at a newly established colony. *Corella* 5: 29–33.
- Dyer, P. K. and Hill, G. J. E. (1992). Active breeding burrows of the Wedge-tailed Shearwater in the Capricorn Group, Great Barrier Reef. *Emu* 92: 147–151.
- Hindwood, K. A. and Serventy, D. L. (1941). The Gould Petrel of Cabbage Tree Island. *Emu* 41: 1–20.
- Hull, A. F. B. (1911). Description of the nest and egg of White-winged Petrel *Estrelata leucoptera*, Gould. *Emu* 10: 252–253.
- Morris, A. K. (1976). Seabird Islands No. 22: Boondelbah Island, New South Wales. *Aust. Bird Bander* 14: 20–22.
- Morris, A. K., Lane, S. G. and Battam, H. (1973). Breeding seabirds of Boondelbah Island, N.S.W. *Emu* 73: 136–137.
- North, A. J. (1914). 'Nests and Eggs of Birds Found Breeding in Australia and Tasmania. Vol. IV'. (Australian Museum; Sydney.)
- NSW National Parks and Wildlife Service (2001). 'Gould's Petrel *Pterodroma leucoptera* Approved Recovery Plan'. (NSW National Parks and Wildlife Service; Hurstville.)
- Priddle, D. and Carlile, N. (1997). Boondelbah Island confirmed as a second breeding locality for Gould's Petrel *Pterodroma leucoptera leucoptera*. *Emu* 97: 245–248.
- Schultz, M. A. (1994). 'A comparison of the breeding ecology of the Short-tailed Shearwater *Puffinus tenuirostris* and the Wedge-tailed Shearwater *Puffinus pacificus* on Montague Island, NSW'. Bachelor of Applied Science (Parks, Recreation and Heritage) Honours thesis, Charles Sturt University, Albury.
- Warham, J. and Wilson, G. (1982). The size of the Sooty Shearwater population at the Snares Islands, New Zealand. *Notornis* 29: 23–30.

Acknowledgments

We thank Alan Leishman, Graham Fry, Dean Portelli and Hayden Torr for assisting with the seabird surveys. Staff of the NPWS Hunter Area provided assistance on several occasions. We also thank the many volunteers who assisted in the translocation of Gould's Petrels from Cabbage Tree Island to Boondelbah Island. Robert Wheeler commented on earlier drafts of the manuscript and drew the figure. ABBBS provided data pertaining to recovery records. This study was funded by the NSW State Biodiversity Strategy.

Date compiled: 30 December, 2003.

Revised: 14 June, 2004

David Priddle and Nicholas Carlile, Department of Environment and Conservation (NSW), 43 Bridge Street, Hurstville, New South Wales 2220.