

SEABIRD ISLANDS

No. 39/1

Flinders Islet, Five Islands Group, New South Wales

Location: 34°27'16" S: 150°55'30" E: 2.6 km offshore from Port Kembla, New South Wales (NSW). It is part of the Five Islands Group, located 3.5 km north of Big Island No1.

Status: Nature Reserve administered by the NSW National Parks and Wildlife Service (NPWS), Office of Environment and Heritage. Entry permit required.

Other Names: Toothbrush, Tom Thumb Islands (including Bass Islet).

Description: Flinders Islet is part of the Five Islands Group, which also includes Bass Islet, Martin Islet and Big Island (comprising two main parts, known as No. 1 and No. 2). The total area of Flinders Islet is 2.6 ha, with 0.4 ha being vegetated. The geology of Flinders Islet resembles that of all islands in the Group and is as described for Big Island, comprising a Dapto-Saddleback Latite Member of the Permian Gerringong Volcanics³.

Flinders Islet has a long, narrow shape and is aligned north-south, with its highest point at 13 m being on the plateau at the islet's south-western and widest end. The vegetated and elevated plateau is skirted by a cliff 260 m long that slopes down to the south-west to meet the rock platform. The extensive eastern rock platform includes shingle beds and shallow, fresh water pools. All approaches to the islet encounter a rocky shoreline (see Figure 1).

The plateau is dominated by the low-growing, exotic shrub Bitou Bush *Chrysanthemoides monilifera rotundata* and a single large Mirror Plant *Coprosma repens*, a New Zealand shrub. In the southwest, shallow soil areas support a mixture of Wandering Sailor *Commelina cyanea*, Kidney Weed *Dichondra repens* and Pigface *Carpobrotus glaucescens*, the latter being noted here in the 1970s¹. All other plant species mentioned in that earlier survey are still extant on the island. The survey by Mills⁴ in 2014 recorded 20 native and 16 exotic plant species.

Landing: Landing can be effected in moderate to light swell from a tender into the gutter on the northwest shoreline which terminates in a pebble beach. Alternatively, a landing can be made directly onto rocks to the north of the gutter where a deep-water approach allows a bow disembarkation (Figure 1).

Ornithological History: Battam¹ detailed the ornithological visits to Flinders Islet up until 1976. An additional visit by Iredale and Chisholm in November 1927 (to 'Bird Island') found Silver Gulls *Chroicocephalus novaehollandiae* and Crested Terns *Thalasseus bergii* in a mixed colony of 'thousands of birds'⁵. Neither of these species has since been recorded as breeding on Flinders Islet¹. Since 1976, several banders and members of the Southern Ocean Seabird Study Association (SOSSA) have occasionally visited the islet to conduct banding (Australian Bird and Bat Banding Scheme [ABBBS], submitted data).

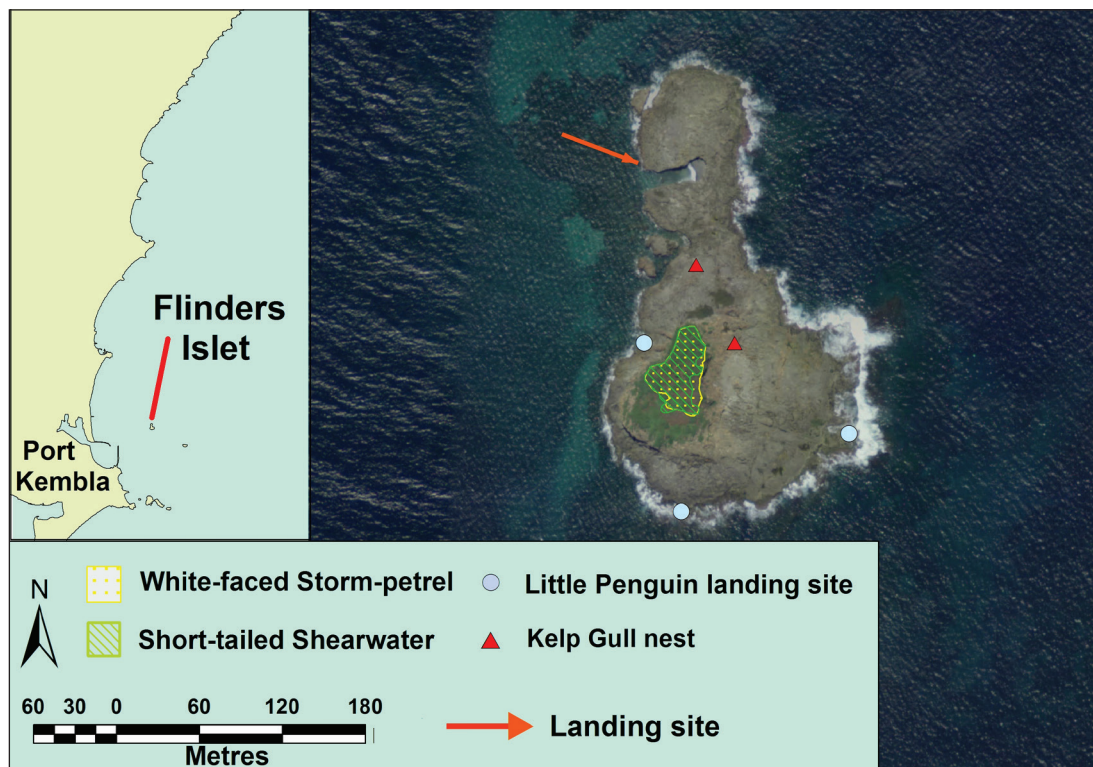


Figure 1. Flinders Islet, Five Island Group, New South Wales

C. Lloyd and C. Mower visited overnight on 20–21 September 2016 and C. Lloyd and N. Carlile overnight on 22–23 November 2016 to survey nesting seabirds. They paid a further day visit (with R. Morris) on 24 January 2017 to document shearwaters' distribution and burrow occupancy.

Breeding Seabirds and Status

Pelagodroma marina White-faced Storm-Petrel — Found on the plateau's northern half where soil depth is sufficient for burrowing and the height of exotic shrubs (< 800 mm) does not appear to hamper either the birds' access to the soil surface or to clear areas for take-off. In September 2016, up to 20 individuals were seen in the air during nocturnal observations. In November 2016, six 20 m-long transects were laid out east-west across the plateau and all burrows up to one metre either side of the transect were counted. After establishing the general presence or absence of petrel burrows in the area, the perimeter of the colony was walked using a hand-held GPS to gauge colony size. Despite great care being taken, one burrow that contained an adult incubating an egg was accidentally damaged. It was rebuilt with a stick-supported roof and the bird returned to the egg. The entrances to 35 burrows were fitted with stick palisades on the afternoon of 22 November 2016. These palisades were re-examined for disturbance on the following morning, with 10 having been dislodged. All these disturbed burrows were considered active nests. The total area on the plateau used for nesting was 1,622 m². Three of the original six transects were in storm-petrel habitat and collectively covered 7% of the suitable, available habitat. They had 11, 29 and 18 burrows, respectively, giving an overall mean nesting density of 0.12 ± 0.03 burrows per m². Combined with an estimated 29% burrow occupation rate, this density estimate suggests a minimum breeding population of approximately 56 ± 15 pairs. This is within the range recorded between the late 1960s and mid-1970s¹, but is considerably less than the 1999/2000⁶ estimate of 300 breeding pairs.

Ardeanna pacifica Wedge-tailed Shearwater — Originally recorded as nesting in an area now dominated by a large Mirror Plant¹, and probably with the deepest soils on the plateau. Despite several hours of nocturnal listening in September and November 2016, no calls of this species were heard. The checking of shearwater-size burrows as part of transect surveys (see below) also failed to detect the presence of this species. From the survey in the 1970s¹, 5 to 10 breeding pairs were estimated to be present on the island, but the species' presence was not detected by banding activities until 1994 (maximum of 28 birds recorded in one day out of a total of 106 birds in October 1995; ABBBS data). A larger population of 30 pairs was estimated in the late 1990s⁶.

Ardeanna tenuirostris Short-tailed Shearwater — Nests sparsely across the northern half of the plateau, where soil depth allows for scrapes below thick shrubs or nesting in shallow burrows. No calls of this species were heard during more than seven hours of listening in September and November 2016. In January 2017, the perimeter of the area of burrow occurrence was walked with a hand-held GPS before five (20 m long x 2 m wide) transects were laid out and surveyed (covering 8% of the available habitat). All 7 burrows identified were examined for occupants, with only a single chick (< 1 week of age) being encountered. The total area of available habitat was 1,500 m². The burrow density within the transects was 0.02 ± 0.01 per m², giving an

estimated total of 30 burrows on the islet. If the average burrow occupation rate from nearby islands² of 50% is applied, we would estimate the breeding numbers on Flinders Islet to be about 15 ± 8 pairs. This species was not identified on the islet in the 1970s¹, but its presence was detected during banding activities in the 1970s–1990s (maxima of 33 individuals on one day in 1987 and 10 on one day in 1992; ABBBS data) and its population was estimated by the late 1990s⁶ to be 30 pairs.

Eudyptula minor Little Penguin — Although it occasionally nests below the plateau in rock cavities and overhangs, most of this species' breeding takes place on the plateau in scrapes under shrubs. The landing sites for access to the islet were mapped during the overnight visit in September 2016 (Figure 1) and we attempted to count all penguins that came ashore. Counts began at dusk and continued until no penguins had arrived during two consecutive 15-min periods (until approximately 20:30 hours). In November 2016, Little Penguins on nests were identified during transect walks (which covered 7% of the total plateau area; see above) surveying Storm-Petrel density. From the September 2016 counts, 14 birds were observed ascending the plateau (-34.456745 S: 150.929299 E), two were seen moving to rock cavities and overhangs (-34.456056 S: 150.92969 E) and one to a rock crevice (-34.45608 S: 150.929349 E). On the following day, these latter two sites contained penguins incubating eggs. The rest of the penguins ascended the plateau up a gradual slope from the south where later three birds were found incubating eggs and two brooding chicks. From the ratio of nests with one adult incubating eggs to nests with one adult brooding chicks, combined with known breeding behaviour (i.e. three-day incubation shifts, meaning that 1/3 of incubating adults return each night, and nightly change-overs of brooding adults⁷), we estimate that each bird landing on the islet 'represented' 2.4 active nests, giving a total population of 34 breeding pairs. The November 2016 check (three nests with either incubating birds or chicks in six transects covering the entire plateau) yielded lower numbers at this later time in the penguins' breeding season, but the September estimate resembles previous published results^{1,6}.

Larus dominicanus Kelp Gull — Previously found to breed on the islet⁸, and during our visits individuals were observed on both occasions and two empty nests were located. The evidence is thus that the species still breeds on the islet.

Haematopus fuliginosus Sooty Oystercatcher — The extensive area of rock platform and shingle beds favours this species. Lloyd and Mower recorded five active nests and six pairs in 2016 and similar numbers were recorded on the 2017 visit.

Factors Affecting Status

The population of the White-faced Storm-Petrel on the islet has probably remained stable since the 1970s. Due to available soil depth and seasonal drying out, the exotic Bitou Bush may now almost be at its limits of spread and canopy height. From observations on Flinders Islet, but without knowing soil depth, it appears that the Storm-Petrel readily nests under Bitou Bush when it is less than approximately 400 mm high; shrubs over 800 mm had no burrowing beneath them. Restoration of native vegetation by the removal of the dominant exotic shrubs has been recommended⁴. It would be prudent to have the White-faced Storm-Petrel re-established on Big Island before Bitou

Bush control was applied on Flinders Islet. Consideration should be given to drone delivery of herbicide⁹ on this islet to avoid destruction of burrows by trampling.

In comparison with the 1970s surveys, the absence of Wedge-tailed Shearwaters has been 'counterbalanced' by the presence of similar numbers of Short-tailed Shearwaters. It appears that the limited habitat here ensures that no large burrowing species will occur on Flinders Islet in large numbers. The significant increase of both *Ardenna* species in the late 1980s to mid-1990s based on banding returns is inexplicable given the available habitat. The increase in available habitat on Big Island due to regeneration² may have caused the shearwaters to abandon the marginal habitat on Flinders Islet in recent times. The local extinction of Little Penguins on Martin Islet¹⁰ was not replicated on Flinders Islet, which Australian Fur seals *Arctocephalus pusillus* have not yet (re)colonised.

Other Seabirds Recorded

Other seabirds observed during the current survey:

Arenaria interpres Ruddy Turnstone

Thalasseus bergii Crested Tern

Chroicocephalus novaehollandiae Silver Gull

Other Vertebrates Recorded

A skink, *Eulamprus* sp., previously identified by Battam¹, was identified as *Eulamprus tympanum* during these surveys. Solomon Buckman from the University of Wollongong photographed a Barn Owl, *Tyto javanica*, in August 2018 while undertaking geological survey work. This species is also known to visit Big Island.¹ The species responsible for a large abandoned nest found in a cliff cavity of the plateau's northern is yet to be identified.

Banding

Data for all banding records from December 1968 to 2010:

Pelagodroma marina – 276 adults and 30 nestlings, with 27 recoveries of adults on the islet.

Ardenna pacifica – 262 adults and 7 nestlings, with 47 recoveries of adults on the islet, 76 on nearby Big Island, one off Ulladulla, NSW and one on Tollgate Islands, Batemans Bay, NSW.

Ardenna tenuirostris – 54 adults, with 4 recoveries - two on the islet and one each on Big Island and Long Reef, Sydney.

Eudyptula minor – 141 adults and 29 nestlings, with 22 adults and 3 nestlings being re-trapped; 17 were recovered on the islet. Four (> 10 years of age) were recovered as far north as Terrigal (linear distance of 120 km) on the NSW central coast. Four were recovered as far south as Phillip Island (688 km) and The Twelve Apostles (839 km), Victoria. Additionally, three nestlings fledged on Big Island were recovered on Flinders Islet and

another Little Penguin that fledged on Lipson Cove, 1,345 km south in South Australia, was also recovered on the islet.

Larus dominicanus – 7 nestlings, with no recoveries.

Haematopus fuliginosus – 1 adult and 23 nestlings, with 12 recoveries: eight recoveries made locally and others as far north as Long Reef, Sydney and as far south as Bermagui (238 km), NSW.

Acknowledgements

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Bibliography

- 1 Battam, H. (1976) Seabird Islands No. 39: Flinders Islet, Five Islands, New South Wales. *The Australian Bird Bander* **14**: 104–5.
- 2 Carlile, N., Lloyd, C., Morris, R., Battam, H. and Smith, L. (2017). Seabird Islands No. 38/1: Big Island, Five Islands Group, New South Wales. *Corella* **41**: 57–62.
- 3 Branagan, D. F. and Packham, G. H. (2000). *Field Geology of New South Wales (3rd Edition)*. NSW Department of Mineral Resources.
- 4 Mills, K. (2014). Vegetation of the Oceanic Islands off the NSW South Coast. 7. Flinders Islet, The Five Islands Group, Illawarra Coast. *Illawarra Vegetation Studies* **39**, August. Coachwood Publishing, Jamberoo, NSW.
- 5 Iredale, T. (1927). A wave-guarded kingdom of birds. *Emu* **27**: 271–274.
- 6 New South Wales National Parks and Wildlife Service (2005). *Five Islands Nature Reserve Plan of Management*. The Service, Sydney.
- 7 Chiaradia, A. F. and Kerry, K. R. (1999). Daily nest attendance and breeding performance in the Little Penguin *Eudyptula minor* at Phillip Island, Australia. *Marine Ornithology* **27**: 13–20.
- 8 Battam, H. (1970). The Dominican Gull on Five Islands, New South Wales. *Australian Bird Bander* **8**: 32–3.
- 9 Hameed, I., la Cour-Harbo, A. and Hansen, K.D. (2014). Task and motion planning for selective weed control using a team of autonomous vehicles. *The 13th IEEE International Conference on Control, Automation, Robotics and Vision*. Pp. 1853–1857.
- 10 Carlile, N. (2018). Seabird Islands No. 41/1: Martin Islet, Five Islands Group, New South Wales. *Corella* **43**: XX–XX.

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