

63rd ANNUAL ASSESSMENT OF SHEARWATER BREEDING SUCCESS ON BARUNGUBA, 21–28 MARCH 2022

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A study of the breeding productivity of shearwaters (*Ardenna* spp.) co-existing on Barunguba (formerly known as Montagu Island) has continued annually since 1960. Before 1959 it was thought that only one species of shearwater bred on the island. In that year, the discovery of two additional species breeding there raised questions regarding the dynamics of this mixed colony.

In this long-term study we measure breeding productivity each year by counting the total number of chicks of each species within three fixed-area plots. This is completed in late March towards the end of the breeding season, thereby avoiding disturbance to breeding adults, eggs and young chicks. Results have been published annually since 1998 in *Nature in Eurobodalla* (e.g., Crowley *et al.* 2021). The format of this report and the abbreviations used are consistent with those in previous annual reports.

Barunguba is divided into two parts by a steep gulch and a beach that is passable at all tides. We refer to these two portions as north island and south island. Replanting of south island with taller vegetation, using plants known to have been on the island in the past, has occurred following systematic control of Kikuyu Grass *Cenchrus clandestinus*. This aborted programme, aimed at restoring seabird nesting habitat, was undertaken progressively between 2001 and 2014 across designated zones, and these zones (numbered 1–9 or assigned as Asset A, B or C and Accidental) are used in this report for reference purposes. They are briefly described (condition in March 2013) and shown on a map in Fullagar *et al.* (2013).

Our shearwater colony study site on the south-east side of north island (zone 9) is known as NISA (293 m²); the two study sites at the north end of south island are known as SISA (428 m²) and THISA (293 m²) and are located within zone 8. The exact location of each study site is shown in Fullagar and Heyligers (2006). The vegetation on each site is mapped annually in March.

Bird records for the island have been reviewed by Fullagar (1989), but many subsequent records are included in annual reports (similar to this one) dating back to 1998. The names and taxonomic order of birds follow the latest available IOC World Bird List (Gill *et al.* 2022); all other vertebrates follow Clayton *et al.* (2006), except for seals where we follow the recommendations of Shaughnessy and Goldsworthy (2015). Names of butterflies follow Braby (2016); moths follow Common (1990); and vascular plants follow Heyligers and Adams (1989, 2004).

No annual survey was possible in 2020 due to the COVID-19 pandemic. Previously no surveys were conducted in 1961 and 1966, thus this is only the third time since 1960 that an annual survey has been missed.

Survey Team

This year's team comprised Peter Fullagar, Mike Crowley, Chris Davey and David Priddel (MIPartners); Penny Beaver, Harvey Perkins, Vanessa Place, Bronte Evans Rayward, Kristen Vickery and Lesley Priddel.

Weather and Habitat Conditions

Monthly rainfall figures (mm) from April 2021 to the end of March 2022 are as follows: 11.4, 95.6, 76.4, 34.8, 48.0, 41.4, 94.8, 145.0, 44.2, 138.5 (Narooma), 102.2 and 231.4. On 8 and 9 March substantial rain occurred (72.0 and 75.2 mm), the weather potentially impacting

the stability of burrows, leading to a higher incidence of partial to full collapses, with the number of burrows 16% lower compared to the prior year. As well, many of the pathways in the southern part of the island were saturated, some with running surface water.

The vegetation on all study sites was exceptionally dense and lush, even more so than reported last year. Spiny-headed Mat-rush *Lomandra longifolia* was so dense that it was difficult to locate burrows. Scarlet Runner *Kennedia rubicunda* continues to thrive on all sites and Kikuyu Grass has continued to spread alarmingly throughout the island. Last year the infestation on SISA covered 51% of the study site, this year it covered 77%. Kikuyu continues to consolidate along the extensive network of pathways that now criss-cross the island and is rapidly spreading laterally into the surrounding vegetation. Many pathways are no longer mown and, contrary to previous planning decisions, there is no evidence of any action to restrict Kikuyu to the pathways. Morning Glory *Ipomoea cairica* has also continued to increase dramatically in many areas, often smothering other vegetation or covering formerly exposed rock surfaces. Coastal Saltbush *Rhagodia candolleana* continues to spread.

Coverage

We departed Narooma in two trips, the first departing at 0930 on Monday 21 March. Work began on THISA at 1330 and was completed at 1830. The following day work on NISA started at 0930 and finished at 1430. On Wednesday 23 March unfavourable weather delayed the start of work on SISA until 1315; this site was completed at 1740. From 24 to 27 March, we made general observations along most tracks on the south island and during a circuit of north island on 26 March. Southerly winds of 20 knots or greater persisted throughout the day on 25 March, but for most of the week conditions were unsettled with scattered showers. We returned to Narooma on 28 March at noon on a charter boat with strong southerly winds and a 1.5 m south-easterly swell. Ten shearwaters (species undetermined), one Greater Crested Tern and one Silver Gull were observed during the crossing.

Survey Results

1. Shearwaters

The results of this year's survey, together with those for 2021, are summarised in Table 1.

Table 1. Number of shearwater chicks and burrows found in the three study sites in 2022 (2021 data in brackets)

	NISA	THISA	SISA	Total 2022	Total 2021
Wedge-tailed Shearwater	31 (41)	24 (13)	23 (41)	78	95
Short-tailed Shearwater	12 (19)	31 (30)	22 (29)	65	78
Sooty Shearwater	0 (0)	0 (0)	0 (0)	0	0
Number of burrows	117 (130)	91 (99)	93 (129)	301	359
Occupied burrows (%)	37 (46)	60 (43)	48 (54)	48	48

Compared to 2021, the overall number of burrows was lower, but the percentage of occupied burrows was the same (48%). The density of chicks this breeding season was 1,410 per hectare, below both last year's figure of 1,706 per hectare and the long-term average of 1,605 per hectare (1967–2022).

The average weight of Wedge-tailed Shearwater chicks in 2022 was 311 g (136–586 g), lower than last year’s average of 363 g. The average weight of Short-tailed Shearwater chicks in 2022 was 677 g (345–890 g), greater than the previous year’s average of 570 g.

Wedge-tailed Shearwater comprised 73% on NISA, 44% on THISA and 51% on SISA, giving an overall figure of 55%, the same as for last year. NISA continues to be heavily dominated by Wedge-tailed Shearwaters. For the first time the annual number of chicks on THISA exceeded the number on SISA.

Wedge-tailed Shearwaters continue to increase in density per hectare each year compared to a decrease in Short-tailed Shearwaters (Figure 1), 2017 being the year with the highest density of Wedge-tailed Shearwaters ever recorded. A similar observation by Bancroft *et al.* (2004) recorded Wedge-tailed Shearwater numbers more than doubling over a ten-year period (1992–2002) on Rottnest Island, Western Australia. In 2016, Wedge-tailed Shearwaters attempted to breed on Gabo Island Lighthouse Reserve in Victoria (John Arnould, pers. comm.), indicative of a possible range expansion further southward of this species. Tracking data from Wedge-tailed Shearwaters (Beaver 2022) confirm they arrive much earlier (late August or early September) compared to Short-tailed Shearwaters (late October) which may advantage this species’ ability to secure and defend quality breeding burrows.

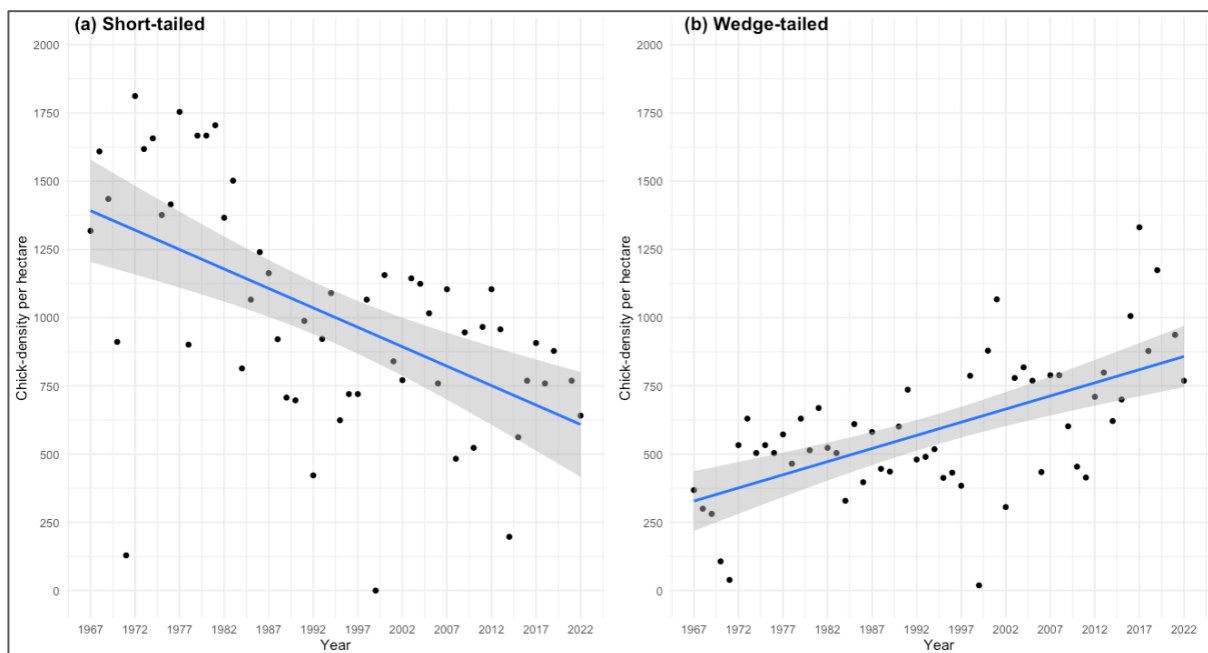


Figure 1: Scatterplot with linear trend of chick density per hectare from 1967 to 2022 of Short-tailed (a) and Wedge-tailed (b) Shearwaters.

A Short-tailed Shearwater banded as a chick on SISA on 20 March 2019 (band number 162-88385) was found dead on Kaimaumau beach on New Zealand’s North Island on 27 December 2021.

2. Penguins

Little Penguin *Eudyptula minor*. No landing site surveys were conducted. Penguin carcasses were found at a Sea Eagle butchering site at the south of the island (zone 8) on 24 March and one individual was seen and several heard in the vegetation after dark that evening.

3. Frogs

Striped Marsh Frog *Limnodynastes peronii*. Widespread on south island. Adults still present in the well at the kitchen garden (zone 6). One adult was seen in a courtyard of the light station, and some were heard calling. Calls were heard and tadpoles found around the soaks and pools in the south-eastern section (zone 8) of south island on 27 March.

General Observations of Birds, Mammals, Reptiles and Butterflies

BIRDS

Thirty species were recorded this year and 6 eBird lists were submitted.

Brown Quail *Coturnix ypsilophora*. Heard or seen on all days with a maximum of 11 on 24 March on south island and seven on 26 March on north island.

Buff-banded Rail *Hypotaenidia philippensis*. Few seen or heard; four on 24 March. All recorded on south island.

Sooty Oystercatcher *Haematopus fuliginosus*. Maximum of 15 seen, five on north island and 10 on south island. Thought to be six pairs, three with an attendant juvenile.

Silver Gull *Chroicocephalus novaehollandiae*. Present in low numbers on all days with a maximum of 34 at seal landing on NW of north island on 26 March.

Caspian Tern *Hydroprogne caspia*. Four observed on most days, three adults and one juvenile.

Greater Crested Tern *Thalasseus bergii*. Present in low numbers on all days with a maximum of five seen at south end of the island on 26 March.

White-faced Storm-Petrel *Pelagodroma marina*. Due to the COVID-19 pandemic no monitoring was carried out on this species during the 2021–22 breeding season. None were seen.

Shy Albatross *Thalassarche cauta*. One observed on 23rd March.

Gould's Petrel *Pterodroma leucoptera*. In January 2022, 25 chicks hatched (compared to 17 the previous year). However, in March only 11 fledglings were present, the loss perhaps a result of persistent rainfall throughout the breeding season (Yuna Kim, pers. comm.).

Wedge-tailed Shearwater *Ardenna pacifica* and **Short-tailed Shearwater** *Ardenna tenuirostris*. See Table 1 for this year's chick count. Individuals of both species seen at sea on most days.

Australasian Gannet *Morus serrator*. Single adults observed on most days. One juvenile seen on 24 March.

White-faced Heron *Egretta novaehollandiae* Five seen on west coast on 24 March; later observed flying to the mainland. One recorded on north island on 26 March.

Spotted Harrier *Circus assimillis*. One adult seen foraging over both islands on all days.

Swamp Harrier *Circus approximans*. Three seen on 27 March on south island. One observed on 27 and 28 March.

White-bellied Sea Eagle *Haliaeetus leucogaster*. Maximum of three (two adult, one sub-adult) seen on most days.

Brown Falcon *Falco berigora*. One adult seen on 22 March.

Peregrine Falcon *Falco peregrinus*. One male and one female and a juvenile seen occasionally.

Crimson Rosella *Platycercus elegans*. One calling in Zone 6 on 22 March; two (one observed and another calling) from the same place on 28 March.

Eastern Spinebill *Acanthorhynchus tenuirostris*. One seen in Accidental zone on 24 March.

New Holland Honeyeater *Phylidonyris novaehollandiae*. Present in wooded area on west side of south island (Accidental zone) on all days. Maximum number of 14 seen on 24 March.

Yellow-faced Honeyeater *Caligavis chrysops*. Common throughout all wooded areas on south island with an estimate of 30 on 24 March.

Grey Fantail *Rhipidura albiscapa*. Seen on most days in the Accidental zone and east of the light station, with a maximum of four on 26 March.

Sacred Kingfisher *Todiramphus sanctus*. Two seen in accidental zone on 26 March.

Australian Raven *Corvus coronoides*. Two seen and heard around the light station most days.

Robin *Petroica* sp. A female, possibly a Scarlet Robin in accidental zone on 24 March.

Welcome Swallow *Hirundo neoxena*. Seen daily. Maximum number estimated at 18 on 24 March on south island. One observed on north island on 26 March.

Little Grassbird *Poodytes gramineus*. Seen once on 24 March.

Golden-headed Cisticola *Cisticola exilis*. Few seen and heard. Recorded on all days. Maximum of two seen.

Silvereye *Zosterops lateralis*. Unusually scarce. Two seen on 25 March, one on 26 March and three on 26 March. All records on south island.

MAMMALS

Seals.

A count on 26 March gave a figure of 239 individuals on north island and a maximum of 10 on south island on previous days. We did not attempt to distinguish **Long-nosed Fur Seal** *Arctocephalus forsteri* from **Brown (Australian) Fur Seals** *Arctocephalus pusillus doriferus*. Almost all seals were along the western and northern shores of north island between the gulch and the centre of the northern rock platform. No seals were present at the 'traditional' haul-out area for seals in the NE of north island although the rocks were 'whitewashed'.

REPTILES

Green Sea Turtle *Chelonia mydas*. One seen on east side of the gulch on 23 March.

White's Skink *Egernia whitii*. Seen occasionally on rock outcrops.

Grass Sun-skink *Lampropholis guichenoti*. Observed occasionally.

BUTTERFLIES

Dingy Grass-skipper *Toxidia peron*. Seen occasionally during sunny periods. Fewer numbers than usual.

Cabbage White *Pieris rapae*. A few seen.

Common Brown *Heteronympha merope*. A few seen most days, only females.

Long-tailed Pea-blue *Lampides boeticus*. Fewer in number than usual.

Common Grass-blue *Zizina otis*. A few seen.

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