

SHORT COMMUNICATIONS

RECORDS OF THE SHORT-TAILED SHEARWATER *PUFFINUS TENUIROSTRIS* IN ANTARCTIC WATERS

Dark shearwaters are frequently observed in the summer months (January - March) over the ocean between Australia and Antarctica (Phillips 1963; Johnstone & Kerry 1976). These have been identified on field characters as Sooty Shearwaters *Puffinus griseus* (Falla 1937; Van Oordt & Kruijt 1953) or Short-tailed Shearwaters *P. tenuirostris* (Routh 1949; Ozawa *et al.* 1968).

The two species are difficult to distinguish in the field and as Johnstone & Kerry (1976) suggest, their identification depends on collection of specimens. We report here the first positive identification of *P. tenuirostris* collected in Antarctic waters and details of their reproductive condition. The four sites of collection are shown in Figure 1.

On the night of 20 February 1980 at 64° 37' S 132° 41' E five shearwaters landed on board M. V. Thala Dan during a blizzard. Three of these died and were unfortunately thrown overboard by crewmen. The two remaining birds were identified as *P. tenuirostris*.

The following night, 21 February, 65° 30' S 138° 30' E (250 km SSE), in similar weather conditions, sixteen live and seven dead *P. tenuirostris* were found on board. The live ones were released and the seven dead specimens were frozen. On both occasions up to 1,000 shearwaters were seen flying around the ship's powerful lights.

One year later on the night of 18 February 1981, again during a blizzard, one live and one dead *P. tenuirostris* were collected on board M. V. Nella Dan at 64° 25' S 84° 03' E (2,400 km W of the 1980 sites of collection). A month later on 17 March at 60° 57' S 105° 03' E (approx. 1,000 km NE) in similar weather conditions, seven more specimens were collected. As on the previous occasions, many similar shearwaters were observed in the same vicinity.

Reproductive condition

Table I details the reproductive condition of the birds. The seven males had small testes with a microscopic appearance of refractoriness; the eight females had small oocytes. All could therefore be regarded as being in the condition characteristic of immatures (pre-breeders) or non-breeders (Marshall & Serventy 1956). Non breeding birds of unknown age were taken for comparison from the surface of a breeding colony (collected by K. Fitzherbert at Phillip Island, Victoria) at times corresponding with the Antarctic collections. They too had small testes and oocytes. The two females from the breeding colony had a convoluted or thickened oviduct, and so did all three females from the 1981 Antarctic sample. This contrasted with the five females from the 1980 sample,

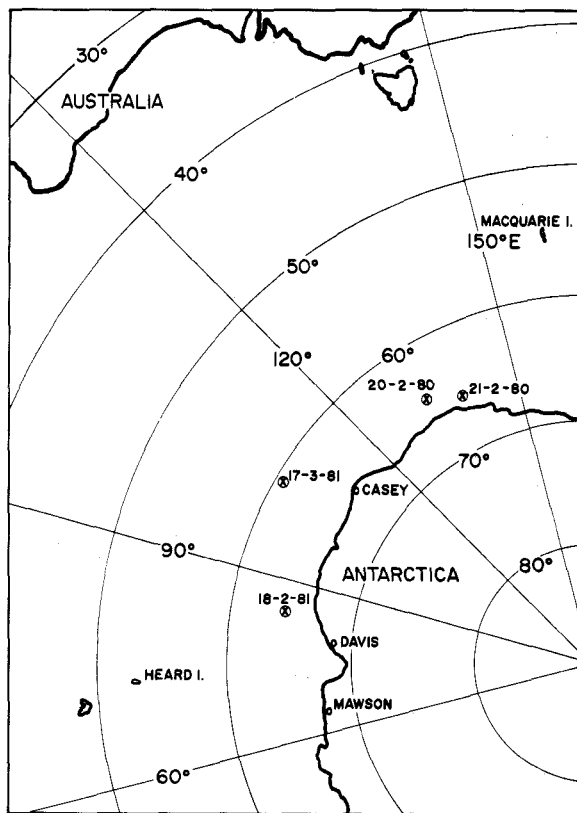


Figure 1. Sites and dates of collection of Short-tailed Shearwater *Puffinus tenuirostris*

which all had straight and thin oviducts.

Gut contents

The gut contents of the fifteen specimens collected in 1980 and 1981 are listed in Table II. Nine contained identifiable specimens of Antarctic krill *Euphausia superba* in amounts up to 75 g. Other items included the remains of crustacea, probably amphipods, and lenses and beaks of squid, and one fish. Three of the 1980 specimens contained granite pebbles and one collected in 1981 had quartz pebbles. The provenance of these is difficult to establish but they were not unlike the granite found on the breeding islands in the Bass Strait. We do not know how long gizzard stones remain in the gut after ingestion.

P. tenuirostris breeds mainly on islands from South Australia to New South Wales, its main concentration

TABLE I

Reproductive condition of P. tenuirostris from Antarctic waters compared with non-breeding specimens from a breeding colony at the corresponding season.

Specimen number*	Largest oocyte (mm)	Oviduct + diameter (mm)	Specimen number	Testes size (mm)
2	1	Straight (4)	1	5 × 3
3	1	Straight (4)	7	7 × 3
4	1	Straight (4)	8	7 × 3
5	1	Straight (4)	10	6 × 4
6	1	Straight (2)	12	5 × 4
9	1	Convuluted (12)	13	7 × 5
11	2	Convuluted (8)	15	7 × 4
14	1	Convuluted (6)		
A	2	Straight (15)	B	7 × 3
E	1	Convuluted (8)	C	5 × 3
			D	4 × 3
			F	6 × 3

* Specimens 1-7 were collected on 21 February 1980 and the skins are in the National Museum of Victoria (numbers W10460-66 sequentially); specimen 8 was collected on 18 February 1981 and is number 2/81 in the records of the Antarctic Division; specimens 9-15 were collected on 17 March 1981 and are numbers 3-9/81 sequentially in the records of the Antarctic Division; specimens A-F were collected in February 1981 at Phillip Island, Victoria, and are in K. Fitzherbert's series 8581, Department of Zoology, Monash University.

TABLE II

Gut contents of P. tenuirostris taken in Antarctic waters.

Specimen*	Gut contents**
1	5 <i>Euphausia superba</i> (1.9)
2	37 <i>E. superba</i> (4.3)
3	1 Fish (5.0) + crustacean debris
5	14 <i>E. superba</i> (4.2)
8	256 <i>E. superba</i> (75.0) + 1 squid
9	14 <i>E. superba</i> (0.8) + 1 squid
10	1 squid + crustacean debris (0.8)
11	10 <i>E. superba</i> (4.2) + 2 squid
12	4 <i>E. superba</i> (1.9)
13	34 amphipods (3.0) + 2 squid
14	<i>E. superba</i> debris (5.2)
15	60 <i>E. superba</i> (23.0)

* Numbers as in Table I. 4, 6 and 7 were empty

** First figure is estimated number of items; figure in brackets is total wet wt in g.

Squid remnants were lenses (+ beaks in specimen 13) and were not further identified; crustacean debris was not further identified.

being around Tasmania and Bass Strait (Serventy *et al.* 1971). After leaving its breeding colonies in April it performs a trans-equatorial migration into the northern Pacific region (Serventy 1953). A specimen collected dead from Macquarie Island on 19 November 1960 (Warham 1969) and another collected at sea at 57° 56' S 153° 53' E on 12 February 1967 (P.C. Harper pers. comm.) are consistent with our records from Antarctic waters, and thus the known range of this species is considerably extended. It also raises the question of whether the large flocks of dark shearwaters in the Antarctic waters are composed only of *P. tenuirostris* or have *P. griseus* as well.

Another question is that of the age and breeding status of the birds in these flocks. *P. tenuirostris* does not begin to breed until it is six or seven years old (Serventy 1967). One and two-year-old birds apparently remain at sea and are rarely recorded ashore. Three and four-year-old birds visit their natal colonies between January and mid-March. The non-breeding five, six and seven-year-old birds arrive in November, and some females lay eggs (apparently infertile - Naarding 1980) on the surface and desert them; these birds cease visiting the colonies by mid-January (Serventy 1967). Successful breeders hatch one chick in early January and after the first seven days parents feed it alternatively at about ten day intervals until about mid-April when it is deserted.

At first sight the birds in the Antarctic waters might seem likely to be immatures, but Naarding (1980) suggests that breeding birds may fly far south during the nestling period. They would have to fly about 5,000 km to reach the areas where the present specimens were collected. A twenty day absence from the colony might permit this, if they maintained a 500 km/day average, but we believe it unlikely that they perform the return journey while feeding chicks. The main item in the guts of our specimens, *E. superba*, has not been found in breeding birds or in chicks during February and March, and indeed samples from such birds contain the fish, squid and crustacea found in local waters (I. Skira, pers. comm.). It is however an energetic enigma that the feeding intervals are so long if the parents are only foraging locally, and Serventy (1967) calculated a possible feeding range of adults of about 2,000 km, based on the finding of pumice in chicks' stomachs.

The regressed state of the gonads is not conclusive evidence about immaturity or breeding status either, since even birds from the breeding colony have regressed testes and small oocytes in February.

The presence of convoluted ovaries in some of the females suggests that they may have laid eggs, perhaps the 'surface' infertile ones, or had failed in a breeding attempt for some other reason, e.g. predation of egg or mate or collapse of burrow. However, Serventy (in litt.)

dissected a four year-old bird in December 1972 and found an oocyte of 1.6 mm and an enlarged oviduct, convoluted in the upper portion. This suggests that pre-breeders even as young as four year-olds may undergo similar cyclic changes to those undergone by mature birds.

We conclude that the birds described here from the Antarctic waters could be non-breeders or failed breeders or pre-breeders, or combinations of all of these. It may also be possible that the 1980 Antarctic birds (all with straight oviducts) were from a flock of younger individuals than the 1981 ones, and that the Antarctic flocks are segregated in age and breeding status.

We wish to thank L. Cole for help in collecting the birds; K. Fitzherbert for data from her sample birds from Cape Woolamai, for discussion and for assistance with dissection; B. Fuhrer for photography; R. Taylor for histological preparation; R. Williams for identification of stomach contents; and D.L. Serventy for comment on a draft and permission to use his data.

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SHORT-TAILED SHEARWATER ON FIGURE OF EIGHT ISLAND, ARCHIPELAGO OF THE RECHERCHE, WESTERN AUSTRALIA.

During a survey of breeding seabirds on islands of the Archipelago of the Recherche, my wife and I spent eight hours on Figure of Eight Island on 1 November 1981; Figure of Eight Island is at the western end of the archipelago, some 33 km south-west of Esperance.

This island is recorded as a nesting station of the Flesh-footed Shearwater *Puffinus carneipes* (Serventy & Whittell 1948). V.N. Serventy (1952) visited the island on 7 November 1950; he reported that "Although a number of burrows showing fresh marks of diggings were searched, no birds could be found. However, the whole of the central portion of the island is a rookery". He did find Great-winged Petrels *Pterodroma macroptera* nesting there.

During the visit on 1 November 1981, the first burrow checked was found to contain a Short-tailed Shearwater *Puffinus tenuirostris*.

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Following this discovery, over 150 "fresh" burrows were checked ("fresh" burrows were those with a clear indication of very recent activity by the birds). Birds were found in sixteen of these; two birds were found in each of three burrows and one bird in each of the other thirteen. All nineteen birds found were Short-tailed Shearwaters. At the date of the visit, most Flesh-footed Shearwaters would have been at sea during the daytime with only a few remaining in burrows. On the other hand, Great-winged Petrels, which nest in winter, would have been expected to have large chicks present.

We checked burrows first in an area immediately behind the beach on the eastern side (part of the central area referred to by V.N. Serventy). Subsequently, checks were made in areas across the northern slopes of the southern end of the island and the north-eastern side of the central isthmus. Short-tailed Shearwaters were found in each of these areas.

For some years beach-washed Short-tailed Shearwaters have been reported from Esperance and other parts of the south coast of Western Australia. The earliest of these is probably that reported by D.L. Serventy (1947), who found the remains of one of these birds on a beach near Hopetoun in November 1946; he indicated that the finding should "occasion little surprise, as birds from the South Australian breeding islands no doubt forage widely westward over the Great Australian Bight..."

Subsequently, other beach-washed specimens were reported. Dr Serventy (1948) found three at Esperance on 23 April 1948 while Storr & Johnstone (1977) reported birds found near Esperance, near Albany and at Yallingup, which is on the western coast south of Cape Naturaliste, in 1976 and 1977. Since then, others (unpublished records) have found derelict specimens at Esperance. I also found two on the beach there in November 1981.

The report by Frith (1978) that Short-tailed Shearwaters had been captured alive near Phuket Island, western peninsula Thailand in May 1977 and the findings reported here indicate that some Short-tailed Shearwaters, probably ones that breed in south-western Australia, may migrate regularly to the northern Indian Ocean.

Although large areas of Figure of Eight Island were not checked during the visit in 1981, only Short-tailed Shearwaters were found in the burrows searched. Four weeks earlier I had banded Great-winged Petrel chicks near Albany; they were still developing feathers at the time. Even if young of this species had been present in the areas searched on Figure of Eight Island before our visit, and already departed, some evidence of their occupation would have been found. Also, only two days

earlier I had banded Flesh-footed Shearwaters in burrows during the day on nearby islands, and did likewise in the following week. Their occurrence on Figure of Eight Island was expected but none was found. However, it is probable that some of the burrows checked may have belonged to this species.

The presence of Short-tailed Shearwaters in burrows, prepared and lined, is a clear indication of breeding, though still some three weeks prior to their normal egg-laying dates. The recorded breeding range is from Broughton Island, New South Wales, to St Francis Island, Nuyts Archipelago, off Ceduna, South Australia. The present record extends this range some 1,100 km west of the previously recorded limit.

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COMMUNAL BEHAVIOUR OF BROWN-HEADED HONEYEATERS

In the most recent review of communal breeding in Australian birds, Dow (1980) lists the Brown-headed Honeyeater *Melithreptus brevirostris* among those species for which this habit has been reported only once or twice. Neither he nor Rowley (1976) could find any information additional to that quoted by Harrison (1969), which refers to three Brown-headed Honeyeaters attending a young Pallid Cuckoo *Cuculus pallidus* at each of two nests (recorded under RAOU Nest Record Scheme). In fact, Boehm (1957) stated that nestlings of this honeyeater in south-eastern South

Australia were fed by "helpers", and suggested that such birds were possibly the progeny of the previous year. Serventy (1958) also reported three birds feeding fledgelings on an RAOU Campout in south-western Western Australia.

Around Armidale, New South Wales, I have noted Brown-headed Honeyeaters in groups of three to eight in most months of the year, and though I have insufficient nesting data, I believe that communal breeding occurs in *brevirostris* at least as often as it does in the