

Penguin Study Group—Second Report

PAULINE REILLY and PETER BALMFORD

The Penguin Study Group (VORG) is continuing its study of the Little Penguin *Eudyptula minor* on Phillip Island, Victoria. This report covers the period 1 July 1969 to 30 June 1970 and refers to the Study Area unless stated otherwise. As most of the birds handled had been banded in the previous twelve months, it is possible to make some comparisons between two consecutive seasons. Work continued on a regular weekly basis along the lines described in our previous report (Reilly and Balmford, 1969).

Banded Population

Sixteen unmarked adults found in pegged burrows were banded and curiously enough 16 of the previously banded population (115 adults less 3 dead) were not seen. Thus 112 adults of unknown age were handled. None of the chicks previously banded was seen again on Phillip Island.

Of the total of 131 banded adults, 62 were recorded as males and 61 as females. The sex of the remaining eight could not be satisfactorily determined. It would seem that there is not any marked preponderance of one sex.

Burrow Allegiance and Pair Bond

Fifty-two penguins were recorded as having bred (successfully or unsuccessfully) in both seasons. As the burrows are excavated in sand, many of them collapse after a time and so are not readily available for a second season. Even so, 17 birds used the same burrow for the two seasons and the other 35 can be said to have returned to the same part of the Study Area.

Some banded birds nested beyond the arbitrary boundaries of the Study Area in the second season and it was not practicable to record their activities in detail or to look for others which may have done the same thing.

The pair bond was retained from the previous season by 19 of the 35 pairs which bred this season. Twelve pairs had not been paired together in the previous season and there were four pairs not seen the previous season.

The following example suggests that the death of one male may have led to a chain reaction involving six other birds.

190-00172 ♂ was found dead on 23 December 1968 having bred successfully that season with 190-00098 ♀.

190-00098 ♀ paired successfully in the following season with 190-00136 ♂ which had previously bred successfully with 190-00149 ♀.

190-00149 ♀ then paired successfully with 190-00137 ♂ which had previously bred unsuccessfully with 190-00152 ♀.

190-00152 ♀ then paired unsuccessfully with 190-00112 ♂ which had been recorded as a non-breeder in the first season.

Egg Measurements and Incubation

Measurements of 74 eggs in the 1969-70 season ranged between 49.9-63.2 x 39.0-45.8 mm, with a mean of 54.6 x 42.0 mm.

Incubation may start either just before or at the laying of the second egg, coinciding with brood patch development; or it may be delayed. For instance, there were two fresh cold eggs in B.343 on 11 October. Neither parent was present in the middle of the afternoon nor at night between 20:00 and 21:00. However, both eggs hatched together on 15 November, 35 days from discovery.

The contents of B.378 and B.379 were examined frequently during incubation and after hatching. In one case, though an interval of three days occurred between laying of the two eggs, they hatched on successive days giving incubation periods of 37 and 35 days. The chicks from both burrows disappeared prematurely.

At no stage was a continuous night watch maintained and it is possible that the eggs in

These burrows were left unattended for part of the night, or more probably that the sitting bird was relieved for part of the night by its mate.

BURROW No. 378

Date	Male 190- 00100	Female 190- 00155	Eggs	Chicks
5 Oct.		x	1 (cold)	
Nov.		x	2	
Nov.	x		2	
15-18 Nov.		x	2	
19-28 Nov.	x		2	
29 Nov.		x	2	
30 Nov.	x		2	
1 Dec.	x		1	1
2 Dec.	x			2
4-9 Dec.	Adults alternated nightly with 2 chicks present throughout.			
10 Dec.	Empty.			

BURROW No. 379

Date	Male 190- 00125	Female 190- 00111	Eggs	Chicks
15-18 Nov.	x	x		
19 Nov.	x	x	1	
20-21 Nov.	x	x	1	
22 Nov.		x	2	
23-25 Nov.		x	2	
26-30 Nov.	x		2	
1-11 Dec.		x	2	
12-21 Dec.	x		2	
22-25 Dec.		x	2	
26 Dec.	x		1	1
27 Dec.		x	—	2
28 Dec.-6 Jan.	Adults alternated nightly with 2 chicks present throughout.			
7 Jan.				2
8 Jan.	Empty.			

Fledging

Chicks too young to be banded, frequently wander from one burrow to another, thus leading to incomplete histories. Some were individually marked with a soft spiral made from a pipe-cleaner and coded with coloured plastic tubing. This was wound around the leg and adjusted on subsequent visits, but in most cases it was not retained for more than a week or two. In one case however it was retained for six weeks

until the bird was banded. This chick hatched in B.381 during the second week in November and was last seen during the second week in January in the same burrow.

Breeding Success

Of the 35 breeding pairs, 13 were successful in raising young to the banding stage. There was no observed attempt at a second clutch where the first was successful. Thirteen of the unsuccessful pairs laid one clutch, eight laid two clutches and one laid three.

There were fewer breeding birds than in the previous season, but the rate of success per pair was much the same.

	1968-69	1969-70
Breeding adults	90	70
Eggs laid	122	87
Eggs failed	50	32
Chicks failed	37	29
Chicks banded	35	26
Eggs laid per pair	2.71	2.49
Eggs failed per pair	1.11	0.91
Chicks failed per pair	0.82	0.83
Chicks banded per pair	0.78	0.74

Breeding Season

In the 1968-69 season, the first egg was probably laid on 29 July. This season, despite weekly examination of over 60 burrows, no egg was found until 30 August 1969. In 1969 the last chick was seen on 12 April compared with 28 February in 1970.

Therefore the 1968-69 breeding season covered the period 29 July to 12 April, whereas the 1969-70 season only lasted from 30 August to 28 February. The reasons for this variation are not apparent.

Parasites

Ticks and fleas were noticeable on chicks and on moulting birds. From one moulting adult, 60 ticks were collected from the head and neck. Many specimens have been collected but processing is not yet complete. It is hoped to include details in a later report.

Moult

Each season less than half of the banded birds were recorded moulting in the Study Area, many of them obviously going elsewhere to moult. In spite of the difference in length of the breeding season, the peak of moulting appeared to be in the last half of February and the first half of March in both years.

Return of Juvenile

No chicks banded during the previous season were found in the Study Area during 1969-70. A chick banded out of the Study Area on 20 January 1969 was caught on 16 November at night coming from the sea. It showed no sign of a brood patch and was therefore probably not breeding.

Dispersal of Young

In the hope of obtaining useful information on dispersal of young, special efforts were made to band chicks wherever found on Phillip Island. Five hundred and one were banded, making a total of 596 chicks banded since the study began. By 30 June 1970, 22 of these chicks had been recovered away from Phillip Island, 19 of them within two months of banding.

Dispersal does not appear to be entirely random, as all recoveries were to the west of Phillip Island. In addition three birds of unknown age have also been recovered to the west.

Thirteen recoveries of young birds were over 60 miles distant, the longest (158 days after banding) being to Grange Beach, S.A., a distance of 442 miles in a straight line but about 560 miles by the shortest sea route. Another was recovered on Kangaroo Island 425 miles distant (approximately 500 miles by sea) 39 days after banding. Even greater speed was shown by a recovery from 79 miles distant, four days after banding.

Artificial Burrows

The depth of pegged burrows is frequently increased beyond human reach, perhaps because of the disturbance caused by regular weekly inspection. This results in loss of continuity of records. To overcome this, we experimented with artificial burrows and after some modifications, these have been installed where burrows have become too deep or have collapsed. They appear to be acceptable to the birds. A clutch was raised to the banding stage in one of them.

Mr J. Richards of Shepparton, though not a member of the Penguin Study Group, designed and made the "burrows". They are of 3" x 2" weldmesh, 3 ft long and 10½" in diameter. One end is open and the other closed, with a 'chimney' 7" high and 8½" in diameter at the closed end. The burrow is buried sloping down towards the closed end and plastic sheeting placed over the burrow prevents sand from falling into it. The chimney is covered by a plastic plug at ground level and the burrow is half filled with sand, leaving only a narrow entrance visible. Creeping

indigenous vegetation is planted on the surface to consolidate the sand and to simulate natural insulation. The burrow can readily be inspected from the entrance or down the chimney.

Although this creates an artificial environment, it is similar to the conditions existing in other parts of the island where there are nesting sites in hard ground on cliffs or under rocks.

Discussion

With the routine inspection of burrows taking place at weekly intervals, certain limitations occur in the collection of data. Nevertheless, we feel that results clearly indicate the value of regular systematic work over a prolonged period. These results could not have been achieved without sustained team work. The responsibility involved is recognized by each of the six team leaders, who files a report, including any suggestions, with the equipment which is then passed on to the next team. Thus all teams are aware of progress and of any matter requiring special attention.

Burrow marking presented difficulty because progressive collapse of some of the entrances moved them well away from the pegs. Then when a new burrow appeared nearby, it was not always clear as to which burrow the peg was related. Because burrows were not all pegged at the one time, adjacent burrows were not in numerical sequence. In order to locate them readily, a map was prepared after surveying by Mr P. B. Reilly assisted by his wife. Pegs from collapsed burrows were left in place in case the occupants returned to use that site again. The examination of a multiplicity of burrows, many of them long defunct, became onerous.

It is proposed to work on a grid system in future, whereby all burrows in a reduced area will be checked and recorded by their grid numbers. In this way there is little danger of some burrows being overlooked. A book entry need only be made when a burrow is occupied. Pegged burrows outside this grid will be examined as before.

As birds of known age have not yet started breeding in the Study Area, it is not yet possible to estimate how long this study will continue.

Reference

Reilly, P. N. and Balmford, P. (1969), 'Penguin Study Group—First Report', *Aust. Bird Bander*, 7:75-79.

(Mrs) P. N. Reilly,
1 Exon Street,
Hampton, Vic.

P. Balmford,
459 The Boulevard,
East Ivanhoe, Vic.