

A Progress Survey of Breeding Shearwaters on Lion Island Faunal Reserve

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Two species of shearwaters are known to breed on Lion Island—the Wedge-tailed Shearwater (*Puffinus pacificus*) and Sooty Shearwater (*P. griseus*), the latter being a rare breeding bird in Australia. A preliminary investigation on December 15, 1956, following the gazettal of the island as a Faunal Reserve, indicated the need for a survey of the breeding behaviour of those two species, that burrows should be marked and birds banded to ascertain as much information as possible.

Twenty visits have now been made and 49 persons have participated in the work; forty of them have been introduced to the island by the Survey Group. Transport for nearly all visits has been provided by the Fisheries Department, whose inspectors at Brooklyn and Woy Woy have willingly co-operated in taking the personnel to and from the island.

TABLE 1

No. of Visits	Season	<i>Puffinus pacificus</i>		<i>Puffinus griseus</i>		Known Breeding Burrows in Survey Colony (containing eggs or nestlings)		
		Banded Adults	Banded Nestlings	Banded Adults	Banded Nestlings	No. of Burrows*	Still Occup. at last check*	Percentage Casualty
2	1956-57	4	—	1	—	A : B	A : B	—
3	1957-58	39	8	7	1	24 : 3	8 : 1	66
5	1958-59	62	12	6	1	31 : 3	10 : 1	68
3	1959-60	27	—	3	—	17 : 2	Nil	100
3	1960-61	12	4	3	2	8 : 2	1 : 2	70
4	1961-62	14	—	3	—	22 : 3	Nil	100
20	Totals:	158	24	23	4	102 : 13	19 : 4	80 (mean)

* A. refers to *Puffinus pacificus*

B. refers to *Puffinus griseus*

Data from such surveys will accumulate over a number of years and this paper is submitted as a progress report.

For some time it has been apparent that considerable predation of eggs and nestlings has been taking place. Table 1 gives details of shearwaters banded over six successive breeding seasons, and a comparison of known breeding burrows and those containing nestlings by March-April.

Young birds would not be expected to leave the island until late April or early May. This comparison is only taken from the survey colony on the high part of the island, where the figures indicate a casualty rate of greater than 80 per cent average over the survey period. In fact, as the latest checks in some years were made in mid-March, it is obvious that the mortality rate would be even higher by the time the nestlings were due to leave. Some years previous to this survey McGill (1954: 121) stated: "The results of the two most recent visits in 1947 and 1954 indicate that the rookery has suffered a serious decline." Damage to the extent outlined in the present survey cannot be suffered continuously in a breeding colony, particularly one so small as this, and a complete desertion of the island ultimately is possible if predation remains unchecked.

For various reasons accurate determination of the causes of predation has not been possible, but such could be caused by:

(a) Humans. No evidence has been found to indicate that human interference is responsible. Some pegs marking burrows were taken and used for firewood on one occasion but no other damage was found. Twice an adult bird escaped when being returned to its burrow after banding and its egg was naturally deserted. Knowledge and skill in carrying out the work has kept damage directly attributable to the survey to the absolute minimum.

(b) Water Dragons (*Physignathus lesueurii*). These reptiles are common but it is doubtful if they cause damage to breeding birds. Mackay (1959: 309) says that faeces of this lizard contained seaweed and crab remains. We have noted that seeds of berries are also included.

(c) Goannas (*Varanus varius*). These large reptiles do occur but in very limited numbers. No doubt they are responsible for some destruction to both eggs and nestlings.

(d) White-tailed Water-Rats (*Hydromys chrysogaster*). Some have been reported to occur on the island, in which case they would most probably take eggs and nestlings.

(e) Brown Rats (*Rattus rattus*). This introduced rodent is present in large numbers and is no doubt responsible for the greatest predation to breeding birds. The complete destruction of eggs around the scree slopes on the lower part of the island is almost certainly attributable to these rats. From the first week in December empty eggs with a hole chewed in one end are to be found in and near empty burrows. In one case an adult bird was found to be sitting on one such egg, which obviously had only just been "emptied".

(f) Skinks (*Sphenomorphus* spp.). Three species of skinks have been recorded in the area but these would not cause predation among sea-birds.

Another sea-bird which nests on Lion Island, in addition to the two species of shearwaters, is the Little Penguin (*Eudyptula minor*), which breeds in good numbers around the lower part, but it appears unaffected by any particular interference. Its aggressive nature and short powerful bill would probably deter any egg-seeking rats.

Table 1 and the foregoing discussion indicate quite clearly that predation reaches very high proportions with eggs and young shearwaters, and in some years it appears to be complete; this may even be the case every season. The greatest single factor appears to be the depredations caused by Brown Rats, and some efforts should be made to have them wholly destroyed.

Lion Island is the nearest breeding colony of the Wedge-tailed Shearwater to Sydney and is one of the few known breeding islands in Australia of the Sooty Shearwater, and it was originally recommended as a Faunal Reserve for those reasons.

During the period of this survey the following recoveries of banded birds have been made away from the island:

(1) *P. griseus*. Banded Lion Island December 6, 1958, adult, and found dead on the beach at Moruya Heads, N.S.W., October 18, 1959. Band number 160-04854.

(2) *P. griseus*. Banded Lion Island December 12, 1959, adult on egg, and found dead ten miles off Rumoi City (Hokkaido, Japan) on May 18, 1960. Band number 160-04899.

(3) *P. pacificus*. Banded Lion Island December 6, 1958, adult, and found dead on Bellambi Beach, N.S.W., on February 25, 1961. Band number 160-04859.

In addition, 67 Wedge-tailed Shearwaters and ten Sooty Shearwaters (adults) have been recovered alive on Lion Island on at least one occasion.

REFERENCES

- Fauna Protection Panel, 1959. *Fauna Conservation and the Wildlife Refuge Idea*, pp. 1-20.
Hersey, F. K., 1959. Report on Lion Island Faunal Reserve. *Wild Life Service*, 1: 7-10.
Keast, J. A., and McGill, A. R., 1948. The Sooty Shearwater in Australia. *Emu*, 47: 199-202.
McGill, A. R., 1954. The Shearwaters of Lion Island. *Emu*, 54: 121-123.
Mackay, Roy D., 1959. Reptiles of Lion Island, New South Wales. *Aust. Zool.*, 12: 308-309.