

THE SHEARWATERS OF SHARK BAY, WA

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SUMMARY

Report to Western Australian Wild Life Authority*

SERVENTY, D. L. 1972. The Shearwaters of Shark Bay, WA. *Emu* 72: 175-177. The results of a survey of the population of Wedge-tailed Shearwaters in Shark Bay in 1971, compared with observations made earlier, are given. The breeding population on the five breeding islands was estimated at 600 pairs. On Slope Island the population was obviously being adversely affected by working for salt and probably by predation by foxes. Recommendations are made for safeguarding the birds there. The population is dimorphic and 20-30% are white-phased birds.

INTRODUCTION

The Wedge-tailed Shearwater *Puffinus pacificus* breeds on islands in a long stretch of the western Australian coastline from Carnac Island in the south to the Forestier Islands in the north-west. On the islands of Shark Bay the breeding birds show a variation of plumage unknown elsewhere in western Australia or indeed in any other nesting station in the Indian Ocean. A proportion of the birds at Shark Bay, instead of being uniformly dark-plumaged as is normal in the species, has white underparts. This dimorphism is widespread, however, in colonies in the Pacific Ocean, but only north of the equator, where the dimorph ratio in favour of the white-phased birds increases with latitude. On some islands in the far north of the Pacific, such as the Pescadores and Bonins near Japan, all birds have white underparts.

That some of the birds at Shark Bay have white underparts was first discovered by Carter (1917), who collected on Slope Island in November 1916. Though he did not mention a white-breasted bird in his paper, he collected one, which is now in the WA Museum, where it was examined by Alexander (1920) and its significance pointed out. Curiously this Australian phenomenon was overlooked by overseas reviewers of the colour-variation in the species, and no mention is made in the definitive study by Murphy (1951). Murphy, even at that late date, believed that all populations in the Indian Ocean were wholly dark-coloured.

I visited Slope Island with a party from the State

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Fisheries Department in 1943 and found white-breasted individuals in burrows. In 1947 I made a survey of the guano-deposits of Shark Bay in M.V. *Warreen* of CSIRO, in the course of which I noted on which islands Shearwaters nested. In 1965 Dr G. M. Storr examined several islands on behalf of the predecessor of the WA Wild Life Authority. As a result of our surveys, which covered almost all suitable islands in the Bay, we established that the Shearwaters nest only on five islands, all in the Freycinet Estuary.

Because the terrain is rocky, it is difficult to examine systematically the nesting burrows; the birds make much use of cavities in the travertine limestone of the islands. Thus, until recently the white-breasted bird was known only from the site of its original discovery, Slope Island. So, when in April 1964 it was revealed in a letter to the *West Australian* by Mr D. G. Bathgate that Slope Island had been made over to a salt company, ornithologists throughout Australia were very much concerned. It was impossible to undo the commitments, though the island was vested in the Fauna Advisory Committee (the precursor of the WA Wild Life Authority) as a fauna reserve.

To find out what was happening to the colony of Shearwaters as a result of the operations of the salt company, Dr G. M. Storr with Messrs J. B. Higham, N. E. McLaughlan and G. Dixon inspected Slope Island and other breeding stations in late August and early September 1965. They found that Slope Island had been greatly altered, but that nevertheless many Shearwaters were still occupying nesting sites on the precipitous eastern slopes. An important discovery was that white-breasted birds also occurred on Baudin Island.

In late November and early December 1966 Mr H. Hall, before he became a member of the WA Wild Life Authority, happened to be in the Bay and made a brief call at Slope Island. At that time the causeway to the island had not been made, but a

bull-dozer was at work levelling the top of the island. A quarter of the island was covered by rubble, crushed limestone and heaps of salt. Shearwaters were seen entering cavities and interstices in the heaps of rubble.

Mr Hall was a member of the recent party from the WA Wild Life Authority that visited the island on 21–22 April 1971. The other members were Messrs A. H. Robinson, N. Beeck, E. Dell, Dr S. J. J. F. Davies and myself. Mr Hall noted that the appearance of Slope Island was vastly different from what it was more than four years previously. Not only was a causeway now in use, which enabled foxes to reach the island, but extensive works had been constructed—buildings, machinery, heaps of salt and a loading jetty. In 1966 an untouched cliff-edge ran about three-quarters of the way round the island, facing east. Now this slope was reduced to about one-tenth of the periphery of the island and was steeper. Patches of Nitre-bush, which still survived on top of the island in 1966, had now disappeared.

RESULTS

The situation of Shearwaters on breeding islands in the Bay, as assessed during the visits of Dr Storr's party in 1965 and of ourselves in 1971, is as follows:

Friday Island

This is a very small islet just north of Slope Island and is the most northern breeding station of the Shearwaters in the Bay, so far as is known. When I landed in October 1947 I recorded no nesting seabirds. However, during his visit on 1 September 1965 Dr Storr found eight burrows of Shearwaters in the Nitre-bush jungle and thought that there could have been more, say 50. We tried to land on 21 April by motor-dinghy, but a southerly suddenly blew up and we abandoned the attempt. We accept Dr Storr's estimate of 50 burrows on the island.

Slope Island

I did not try to estimate the population during my visit in the 1940s. Dr Storr estimated that there were about 150–200 breeding pairs still surviving on his visit on 28 August 1965. We agree that a population approaching this figure may still exist and accept an estimate of about 150 pairs. At the time of our visit the adult birds would probably all have left and many of the fledgelings also. We found three live fledgelings in the nesting crevices and a lady at the island said she saw one fly out the previous night. However, there were 10 dead fledgelings round the colony, all very fresh with no visible signs of the cause of death. There were also two rather old corpses of adults. The occurrence of these is perturbing because one does not see such a high proportion of dead birds in similarly sized colonies of

Puffinus tenuirostris in Bass Strait, nor did we find anything similar on the other nesting islands in Shark Bay. The deaths may be attributed to the salt workings, perhaps by collision with strongly illuminated installations, brilliantly lit all night, or to predation by foxes. We identified tracks of foxes on the sandy beach. Obviously offspring on this island survive less well than those on others in the Bay, though a sizable population of breeding adults continues to occupy the available remnant of the island.

Freycinet Island

This island is now the most densely populated by breeding Shearwaters, but it is difficult to make a satisfactory assessment of the population because the birds use natural crevices on the slopes round the periphery. The top of the island, being hard ground and littered with piles of rock left by guano-diggers of the last century, is virtually not used by the birds. In 1947 I estimated that there might be about 50 burrows on the western side. In 1965 Dr Storr thought that there were 500 burrows on the southern and western slopes though he did not actually handle any birds. During our recent visit our party searched thoroughly and managed to pull four fledgelings out of nesting cavities and found one dead young bird. After the inspection the members of our party, who were not informed of the previous estimates, were asked to note down independently how many breeding burrows there might be on the island. The figures submitted were: 40, 113, 180, 200, 200 and 220. I think we may reasonably accept a figure of about 250 burrows for this island.

Double Island

During my visit in 1947 I noted a 'few' burrows. Dr Storr did not land on the island. During our recent inspection we found several burrows on the western side, among the colony of Pied Cormorants *Phalacrocorax varius*, and some caved in as we walked. Two live fledgelings were pulled out and one egg was found. We estimated that there might be about 50 breeding burrows.

Baudin Island

In 1947 I found no trace of Shearwaters. I evidently overlooked them; for, in 1965, Dr Storr's party saw burrows and caught an adult in one. They estimated that about 100 pairs nested in places on the south-western face covered with Nitre-bush. This is the most southerly nesting station in Shark Bay.

Total population

On present knowledge the following is presumed to be the population of the species breeding on the islands in Shark Bay:

Friday Island	50 breeding burrows
Slope Island	150 " "
Freycinet Island	250 " "
Double Island	50 " "
Baudin Island	100 " "
Total	600

This is not a very large population and no doubt is a considerable reduction from what existed in the Bay before the salt-works started in 1963.

WHITE-BREASTED PHASE

Until Dr Storr's survey of 1965 the white-breasted phase had been found only on Slope Island. On that visit a white-breasted adult was pulled out of a burrow on Baudin Island by Mr G. Dixon. During our recent visit Mr N. Bceck pulled one out of a burrow on Freycinet Island. So now this phase has been noted on three of the five islands on which the species is known to breed. It is reasonable to assume that it occurs on the other two as well.

Dr Storr, first at Slope Island in 1965, tried to assess the ratio of dark to white birds in this dimorphic population. By observing by torch-light birds flying in at night, his party estimated that 30 per cent had white underparts. During our visit we found seven dead dark fledgelings and three white-breasted ones, the result thus tallying with Dr Storr's ratio. However, three live fledgelings found on the island were all dark-phased birds. Thus, of all the fledgelings seen by us on Slope Island three out of 13, or 23 per cent, were white-breasted. On Freycinet Island out of five fledgelings found, only one was white-breasted, or 20 per cent. On Double Island only two dark-phased fledgelings were seen.

So, on our recent visit out of 20 fledgelings (live and dead) examined on three islands (Slope, Freycinet and Double) 16 were dark-phased and four white-phased (20 per cent).

In museum collections the only white-phased specimen that exists is the original one collected by Carter in the WA Museum. Photographs of white-breasted fledgelings were taken on our recent visit.

THE FUTURE

Clearly the salt-workings on Slope Island, directly and indirectly, are having a detrimental effect on the status of Wedge-tailed Shearwaters in Shark Bay. Dr Storr's party found the situation assuring on their

visit in 1965, Mr Dixon reporting: 'After satisfying ourselves that the species was in no danger on Slope Is., providing no further habitat is destroyed (which is unlikely) we returned to the "Vlaming".' Unfortunately the habitat *has* been materially reduced since that time, and additionally the construction of the causeway has allowed foxes to reach the colony.

As a result of my survey I recommended that the salt company be asked to leave the present undeveloped cliff-slopes as they are. Our party was gratified at the solicitude shown for the birds by the company's operators on the site and we felt sure that they would co-operate to ensure the survival of the remnant of this important colony. I also recommended that a suitable grid (such as the provision of moving rollers) be constructed across the causeway, to minimize the chance of foxes reaching the island, and finally that the State Department of Fisheries and Wildlife and the WA Wild Life Authority continue annual surveys of the area with a view to adding to the store of information on the Shearwater, so that more precise data may be accumulated on the strength of the population on the various islands and of the dimorph ratio. A prudent collection of specimens, particularly of the white-breasted phase, should be allowed so that the WA Museum may build up a useful reference collection.

OTHER SPECIES

We found evidence that Bridled Terns *Sterna anaethetus* still breed on the eastern face of Slope Island and did so during the 1970-71 season. On Freycinet Island a colony of about 1,000 pairs of Pied Cormorants was just starting to lay eggs on 22 April. No other seabirds were noted nesting.

Dr Storr's party found Rock Parrots *Neophema petrophila* still plentiful on Slope Island in 1965; they were absent on our visit. We questioned some of the salt company's workers, but they did not know of them. Rock Parrots were abundant on Freycinet and Double Islands.

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