

## BREEDING DISTRIBUTION OF THE BROWN SKUA ON MACQUARIE ISLAND

Macquarie Island, situated approximately half way between Australia and Antarctica, is 34 km long and 4–5 km wide. It consists of a plateau averaging 250 m above sea level, bounded by steep, tussock-covered coastal slopes that are fringed by shingle beaches and raised beach terraces. The Brown or Great Skua *Stercorarius skua lonnbergi* nests widely over the plateau and beach terraces. During the 1974–75 breeding season a strong correlation was found between the occurrence of rabbits, *Oryctolagus cuniculus* and plateau-nesting Skuas (Jones & Skira 1979, Emu 79: 19–23). On the coast however, no such relationship was found as other food was available. The introduction of myxomatosis in 1978 greatly reduced the number of rabbits (Brothers *et al.* 1982, Aust. Wildl. Res. 9: 477–485) and as a consequence it was expected that the number of Skuas breeding on the plateau would decrease but the number nesting on the coast would remain stable. The opportunity to test this hypothesis came in October 1983.

Skua nests were counted between 19 October and 14 November 1983 and the numbers were compared with counts from the 1974–75 breeding season. Searching was during egg-laying so late pairs would not have been counted. Despite this, any trends would have been apparent as most eggs are laid by mid-November (Jones & Skira 1979, Emu 79: 19–23). Furthermore, two chicks about 2 to 3 days old were found on 10 November on the coast and one chick on 13 November on the plateau, evidence that breeding had already started in early October. In comparison, much of the search in 1974–75 was between December and February when many eggs had hatched. Pairs that failed during incubation would have been missed.

The counts showed that Skuas nesting in coastal areas increased by 17% between the 1974 and 1983 censuses (105 and 123 pairs respectively). However plateau-nesting Skuas decreased by 54% (180 and 83 pairs respectively) a highly significant change ( $\chi^2 = 24.23$  d.f.1.,  $P < 0.001$  Table 1). There was no discernable dispersal of Skuas from the plateau to the coast probably because limited space and food prevented many new pairs from establishing.

The major decline on the plateau was in the region between Flat Creek and Green Gorge where rabbits had been reduced by 90% from pre-1978 numbers. Skuas nesting in this region in 1983 were mainly in areas where rabbits still remained. In 1974–75, 45 pairs bred in the vicinity of Green Gorge but in 1983, only 15 pairs had laid by mid-November and the density of rabbits in this

area was  $< 1$  per ha. In contrast, at Caroline Cove where rabbits had spread and increased since 1974–75, the number of Skua nests had declined by over half. Most noticeable was the absence of Skuas nesting around a colony of Royal Penguins *Eudyptes chrysolophus schlegeli*. On 11 November 1983 there was only one pair compared with 8 pairs in 1974–75.

TABLE 1

Number of skua nests found on Macquarie Island  
(C) Coast (P) Plateau

Region	Number of skua nests 1974–75	1983–84
ANARE Base – Bauer Bay (C)	36	45
Bauer Bay – Aurora Point (C)	43	47
C. Toucher – C. Star (C)	26	31
Total	105	123
Flat Creek – Green Gorge (P)	125	42
Major Lake (P)	21	26
Caroline Cove (P)	34	15
Total	180	83

The reason for the declines in density may be that the breeding cycle of Skuas is closely related to the breeding of their main prey. Trivelpiece & Volkman (1982, Ibis 124: 50–54) found that in the South Shetland Islands, Brown Skuas laid approximately 25 days after the peak egg-laying of Adelie Penguins *Pygoscelis adeliae*. On Macquarie Island Royal Penguins lay between 10 and 30 October with the peak about 19 October (Warham 1971, Notornis 18: 91–115). My census of Skuas near the Penguin colony may therefore have been too early. Royal Penguins are also numerous along the coast together with Elephant Seals *Mirounga leonina* whose carcasses are scavenged by Skuas. Elephant Seals are abundant during the breeding season of Skuas and the peak pupping period is the three weeks between late September and mid-October. On the plateau rabbits are the main food for plateau-nesting Skuas. The peak of rabbit breeding is October and November with 92% of the females pregnant between mid-October and mid-November (Skira 1978, Aust. Wildl. Res. 5: 317–326).

My observations were too early in the breeding season to obtain sufficient data to suggest if asynchronous

breeding existed between plateau and coastal-nesting Skuas because of differences in the availability of local food. Observations in 1974–75 indicated large regional differences in diet, which related to the availability of local food. No Skuas nested in areas devoid of local food. A similar parallel exists on the Antipode Islands near New Zealand. There burrow-nesting petrels were the most important food of inland-nesting Brown Skuas and penguin eggs or chicks for coastal-nesting Skuas (Moors 1980, *Notornis* 27: 133–146). Remains of penguin eggs or chicks were not found in inland territories.

The number of Skuas nesting on the plateau on Macquarie Island will probably continue to decline as long as rabbits remain scarce, to the point where local food is sufficient for the remaining pairs. Apart from rabbits the only other source of food on the plateau for Skuas is burrow-nesting petrels, particularly Antarctic Prions *Pachyptila desolata*. Less frequently preyed are White-headed Petrels *Pterodroma lessoni* and Sooty Shearwaters *Puffinus griseus*, while Blue Petrels *Halo-*

*baena caerulea*, Fairy Prions *Pachyptila turtur* and Common Diving Petrels *Pelecanoides urinatrix* are insignificant because they nest in such low numbers (Brothers 1984, *Aust. Wildl. Res.* 11: 113–131). The populations of these petrels on Macquarie Island have been decimated by the introduction of feral cats *Felis catus* and Wekas *Gallirallus australis scotti*. The density of burrows is low and some species are confined to offshore stacks in such low numbers that predation by Skuas is a significant check on increase. Skuas were major predators of these petrels before the abundance of rabbits alleviated predation on the petrels. However as the rabbit population is reduced by control measures such as myxomatosis, overall predation on Antarctic Prions may increase, particularly in areas where petrels are abundant and Skuas continue to breed.

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J. SKIRA, *National Parks and Wildlife Service, P.O. Box 210, Sandy Bay, Tasmania 7005.*

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### FIRST SPECIMENS OF CAMPBELL'S FAIRY-WREN, *MALURUS CAMPBELLI*, FROM NEW GUINEA

Since the description of this species from field notes and photographs (Schodde & Weatherly 1982, 1983), I have been able to examine skins of one adult male, one sub-adult male, and one adult female plus two fledglings in spirit. They were taken by R. W. Campbell and R. D. Mackay at the type locality, Bosavi, at c. 700 m altitude on 2–3 November 1982. All are lodged in the Papua New Guinea Museum and Art Gallery, Port Moresby, except the sub-adult male which is being held on permanent loan by the Australian National Wildlife Collection, CSIRO, Canberra. Regrettably, none of the adults can be identified as a syntype (or selected as a lectotype) because none is from the banded birds on which the original description was based. That description first appeared in "The Fairy-Wrens A Monograph of the Maluridae" (Schodde 1982), and takes its date from the issuing of the first numbers of that work in August 1982.

**Full-grown birds** – The sex and age of the three full-grown birds was determined from dissection and skull ossification, by the enlarged ovary and convoluted oviduct of the female, and by the fact that the female (PNG 17591) was paired with one male (PNG 17590) as the

apparent parents of the two fledglings (R. W. Campbell, pers. comm.). Their plumages confirm those already putatively described for adults of each sex, and no redescription is necessary. A point to be added, however, is the tone of the thighs which are tawny-brown in both sexes and match the under-tail coverts in the female and sub-adult male. The sub-adult male (ANWC 26467), with incompletely pneumatized cranium, is identical to the adult male except for its tawny under-tail coverts and faint white wash on the very centre of the lower belly. This suggests that young males moult directly into a permanent adult "nuptial" plumage at post-fledging moult, as apparently happens in allospecific *Malurus grayi* and other New Guinean malurids, without passing through a hen or "eclipse" plumage as do Australian species of *Malurus* (Schodde 1982).

In body, both males and the female are slightly larger than those recorded previously, the males having wings 56, 57 mm and the female 53 mm (flattened chord measured from bend of wing to tip). Their bills, nonetheless, are all a little shorter (exposed culmen 13–14 mm in males, 13 mm in female) and correspondingly narrower; and as such they are distinctly finer