FURTHER INFORMATION ON THE FUNEREAL COCKATOOS OF EYRE PENINSULA

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INTRODUCTION

Funereal Cockatoos *Calyptorhynchus funereus* on Eyre Peninsula are isolated from the nearest populations on Kangaroo Island and the Mount Lofty Ranges (Blakers *et al.* 1984). In a study begun in 1983, Possingham (1984, 1986) found the population to consist of only 38 birds (32 adults and six immatures or fledglings). Breeding was confined to tree hollows in a small patch of Sugar Gum *Eucalyptus cladocalyx* woodland in the Koppio Hills, near Wanilla (34° 30'S, 135° 45'E). Four nests, and one further probable nest were found in hollows at least five metres above the ground with entrances facing south or south-west. Fifty-six hollows within the breeding area appeared to be suitable nest sites for cockatoos although about 16% were occupied by feral Honey Bees *Apis mellifera* or Galahs *Cacatua roseicapilla.*

Although small, the population appears to have been stable in numbers during the 1970s and early 1980s (Possingham 1984, M. Yancic pers. comm.). In 1984 however, part of the breeding area was cleared for agricultural use. A second study of the population was made in 1986-87 to assess the effect of this clearance on cockatoo numbers and recent breeding efforts. Full details of this study are given in a report prepared for the South Australian Ornithological Association (Nias 1987). The present paper briefly summarizes the study and outlines several recommendations for management of this species on Eyre Peninsula.

METHODS

From November 1986 to March 1987, ten weeks of field work were undertaken in the Koppio Hills, north of Port Lincoln. The number, sex, and activity of cockatoos was recorded and their locations mapped. Particular attention was given to the breeding site and important feeding areas identified by Possingham (1984).

Remnant patches of native vegetation in the Koppio Hills were visited and their suitability as breeding sites for cockatoos was assessed.

When nests were located observations were made on the type and aspect of the hollow used, breeding behaviour, and the progress of each nesting attempt.

RESULTS

Funereal Cockatoos were seen most frequently in the Wanilla area at the breeding site or feeding in pines *Pinus halepensis* at Wanilla State Forest. Occasional sightings at other sites, and evidence of feeding, showed that the birds may range widely over the Koppio Hills, south of Koppio itself. Birds were observed feeding on the seeds of Dwarf Hakea *Hakea rugosa* and pines, and tearing open the flower-spikes of Yacca *Xanthorrhoea tateana* in search of wood-boring insect larvae.

In November 1986, a total of 24 birds (22 adults and two immatures) were observed at Wanilla S.F. There appeared to be equal numbers of male and female birds present. In mid-November the population split into two distinct groups; a group of 18 birds (including both immatures) moved to the breeding site 8 km ENE of Wanilla while the remaining six birds (three males and three females) continued to reside in the State Forest.

Sixteen of the 56 potential nesting hollows originally present at the breeding site, including two used for nesting in 1983-84, had been removed as a result of vegetation clearance. The remaining woodland was subjected to grazing by cattle and showed signs of recent burning and invasion by weeds.

Four nests were found in the same small patch of Sugar Gum woodland used for breeding in 1983-84. By using data collected on *C. funereus latirostris* in Western Australia (Saunders 1982), I estimated that eggs were laid in early December

and nestlings hatched about 28 days later in early Janaury. By 10 March, one nestling had fledged and two others were close to fledging. One nest failed during the incubation phase for unknown reasons.

DISCUSSION

It appears that in mid-October each year, Funereal Cockatoos return to the Koppio Hills after spending much of the year ranging widely over the Eyre Peninsula (see Possingham 1986). However, the number of birds that return each year has declined markedly in historical times. Although flocks of 100 or more birds may have been present in the 1920s and 1930s, there have been less than 40 birds in total during the past few decades (Possingham *loc. cit.,* R. Scott pers. comm., M. Yancic pers. comm.). In 1985, for example, 33 cockatoos were observed at Wanilla S.F. (M. Yancic pers. comm.) and in 1986 only 24 birds were observed (this study).

In addition to low numbers, few of the birds returning each year actually bred. In 1983-84 only five pairs nested and in 1986-87 only four pairs made any nesting attempt. Therefore, about two-thirds of the adult population did not breed in these years. The most likely explanation for such a low breeding effort is the lack of suitable nest sites in areas other than the main breeding area. Although there was an apparent surplus of hollows within the breeding area, the behaviour of breeding birds may limit the number of pairs able to use the site for nesting. In Western Australia, for example, female *C. f. latirostris* behaved agonistically toward each other when selecting and preparing nest hollows (Saunders 1982). Similarly at Wanilla, the spacing of nests within the breeding area suggested that each pair excludes others from nesting too close. In 1986-87 all nests were at least 150m from their nearest neighbour (Nias 1987) and in 1983-84 were between 50m and 150m apart (Possingham 1984).

There appeared to be few areas of woodland remaining on Eyre Peninsula that could support breeding cockatoos. Taller stands of Sugar Gum were probably among the first to be cleared and remaining patches, including Wanilla Conservation Park, contain few trees large enough to provide suitable nesting hollows. In addition, several sites, which had formerly supported breeding cockatoos, seem to have been abandoned since the introduction of stock for grazing and subsequent loss of understorey vegetation. Clearance of native vegetation has also resulted in the loss of important food plants. Those plants remaining after clearance, or along roadsides, may be subject to intense utilization by cockatoos in search of food. In 1986-87, for example, virtually all *Hakea* and *Xanthorrhoea* within four kilometres of the breeding area showed signs of extensive use by cockatoos. The decline of *Xanthorrhoea* is of particular concern as insect larvae present in the flower-spikes may be an essential source of protein for growing nestlings.

In summary, the continued existence of Funereal Cockatoos on Eyre Peninsula is in doubt. A decline in numbers between 1983-84 and 1986-87 suggests that there has been insufficient breeding to replace natural losses over this period. Furthermore, the population may also be at risk from catastrophic events such as drought or fire, and the potential loss of genetic diversity due to inbreeding. Some direct intervention may be necessary if the species is to survive on Eyre Peninsula and I suggest the following points need to be considered in any management of the population:

1. Nest-boxes (artificial or transplanted hollows) should be provided in areas that lack suitable hollows. The most promising site for the erection of nest-boxes is Wanilla State Forest where there are large trees and good food supplies. If possible, several different sites should be selected so as to minimize the potential impact arising from fire or other disasters, and to reduce competition for scarce and/or scattered food resources.
2. Specific areas of native vegetation, particularly the few remaining patches of taller Sugar Gum woodland, should be protected from further clearing or grazing. Rehabilitation of native vegetation, or plantings of Aleppo Pines, might provide extra food for cockatoos near the breeding area and allow numbers to increase.
3. The feasibility of establishing a captive-bred population should be investigated.
4. Remaining birds should be protected as far as possible from human interference, particularly at the breeding site.

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