

Wet-season Feeding by Four Species of Granivorous Birds in the Northern Territory

by STEPHEN GARNETT and GABRIEL CROWLEY

Department of Environment and Heritage, P.O. Box 2066, Cairns, Queensland 4870

Summary

Observations of Peaceful Doves *Geopelia placida*, and Long-tailed *Poephila acuticauda*, Masked *P. personata* and Gouldian Finches *Erythrura gouldiae* corroborate the suggestion that food for granivores is in short supply during the wet season in tropical Australia. The Peaceful Doves appeared to be scavenging seed dropped by Hooded Parrots *Psephotus dissimilis*, and the Long-tailed and Masked Finches were taking old seed at a rate that required them to feed for at least 6 hours a day. Gouldian Finches took only grass seed from standing stems, disappearing from the study area when such food was unavailable.

Introduction

The first weeks of the wet season in tropical Australia are a time when food for granivores is likely to be scarce because seed from the previous season has germinated and the coming crop is not yet ripe (Woinarski & Tidemann 1991, Garnett & Crowley in press). However, there are few observations of feeding by granivores during this period. Frith et al. (1976) showed that the diet of the Peaceful Dove *Geopelia placida* and Bar-shouldered Dove *G. humeralis* in northern Australia is dominated by grass species, although seed from a range of other plants is also consumed, sometimes in large quantities. However, the authors did not elaborate on whether their results included wet-season samples. Tidemann (1992) observed that Gouldian Finches *Erythrura gouldiae*, which have not been recorded as eating any seeds except those of grasses, consume sprouting seeds in the early wet season. This, and the documented decline in availability of fallen grass seeds in the early wet season (Woinarski & Tidemann 1991), suggests that the supply of grass seed is limiting to granivorous species, which are then forced to switch to less desirable food types (Garnett & Crowley in press).

The following incidental observations were made during studies of the feeding ecology of the Hooded Parrot *Psephotus dissimilis* in December 1992 and January 1993, 6-10 weeks after the first heavy falls of the 1992-93 wet season (Garnett & Crowley in press). They comprise observations of the granivorous members of the guild of birds with which the parrots commonly feed, namely the Peaceful Dove, the Masked Finch *Poephila personata*, the Long-tailed Finch *P. acuticauda* and the Gouldian Finch. The observations were made at Gimbat in Kakadu National Park and on the western boundary of the Yinberrie Hills, a site to the east of which the endangered Gouldian Finch breeds but is not found in January or February. Gouldian Finch breeding begins in early March, when *Sorghum* seed becomes available (Tidemann 1992). During December and January Hooded Parrots in the same area switch food types several times; although the parrots showed a preference for grass seeds, they depended on non-grass species for considerable periods whenever the availability of grass seed was low (Garnett & Crowley in press).

Peaceful Dove

The gut (crop and gizzard) contents of one of two road-killed Peaceful Doves collected in January 1993 (Table 1) showed similarities to those described by Frith et al. (1976), with an abundance of sedges, particularly *Fimbristylis* and *Rhynchospora*, being taken. Both differed in the complete absence of grass seed, which was replaced



Peaceful Dove *Geopelia placida*

Plate 54

Photo: G.A. Cumming

by seed of Spurge *Phyllanthus virgatus* (Euphorbiaceae). This highlights the lack of grass seed available at this time of the year, an observation confirmed by soil sweeps in the region. It is not clear whether the presence of sedge seed in the diet is because it is slow to germinate after the first rain or because seed production by members of this family is faster than that of grasses.

Peaceful Doves were observed always to take food from the ground, and also appeared to exploit seeds dropped by Hooded Parrots. On two occasions when it was known that grass seed was locally scarce, two to four doves were observed following a pair of parrots as they plucked fresh fruits from the branchlets of Spurge. The parrots, eating under-ripe seeds, were seen to drop two to three of the six seeds in each Spurge fruit. As Spurge was a principal food in both dove guts analysed and no other seed was available on the ground where the doves were feeding, the doves were probably taking advantage of the parrots in order to obtain food that would otherwise have been unavailable.

Table 1

Number of seeds in the guts of two Peaceful Doves *Geopelia placida* killed on the road to Edith Falls, Northern Territory.

	<i>Crop</i>	<i>Gizzard</i>
16.1.93		
Spurge <i>Phyllanthus virgatus</i>	10	11
19.1.93		
Sedge <i>Rhynchospora subtenuifolia</i>	27	8
Spurge <i>Phyllanthus virgatus</i>	57	32
Sedge <i>Fimbristylis depauperata</i>		121

Masked Finch and Long-tailed Finch

These species fed together throughout the observation period and could not be distinguished in either their apparent diet or feeding behaviour. Feeding was noted on Slender Wanderrrie Grass *Eriachne ciliata*, Cockatoo Grass *Alloteropsis semialata* and Curly Spinifex *Plectrache pungens*.

During the earliest observations, at Gimbat, the birds appeared to be gleaning the last ungerminated seed from the previous dry season. Feeding sites were predominantly clay scalds, from which water drained or evaporated rapidly, or the gravel verges of an airstrip. Samples swept from the ground where the finches had been feeding contained only old seeds of Slender Wanderrrie Grass, many of which had had the kernel removed in a manner characteristic of granivorous birds. Some seeds had germinated and the finches' behaviour suggested that, like the Gouldian Finch, these species eat sprouting seeds: although most seed was pecked from the ground without difficulty, some appeared to require considerable effort, the finches grasping the seed in their bills, arching their backs and appearing to press upwards with their legs until the germinating seed came free.

Apart from when feeding on Cockatoo Grass, both species were seen feeding only from the ground, including in spinifex where Gouldian Finches were taking seed from the standing stems. Even when feeding on Cockatoo Grass, the finches often took food from stems while standing on the ground, sometimes jumping up to pull a stem down to where it could be held by the feet.

The fallen Slender Wanderrrie Grass seed taken by the finches had a density of 910 seeds/m², with a similar density of empty husks (977 husks/m²). It is not clear whether the finches were able to distinguish seed husks from seed containing kernels by sight alone. However, if each peck is assumed to represent one seed taken, the following calculations can be made. The rate of intake for Slender Wanderrrie Grass seeds was 34.6 ± 13.4 seeds/min, $n = 10$ observations, there being no significant difference in rate of intake between Masked and Long-tailed Finches ($t=0.61$, $P>0.01$). As Slender Wanderrrie Grass seed weighed 0.4 mg, the dry-weight intake rate was thus 13.8 mg/min. This rate is similar to that at which Red-browed Firetails *Neochmia temporalis* consume the seeds of Maw *Papaver* sp. (13 mg/min). This seed, which was the same size as that of Slender Wanderrrie Grass (1.2 x 0.9 mm), was consumed at the lowest rate of several foods offered, partly because it was so small (Read 1991). If the two tropical finches cannot distinguish eaten from uneaten seed then the rate of intake would have been only 6.7 mg/min.

Assuming the Long-tailed and Masked Finches have similar nutritional requirements to those of Zebra Finches *Taeniopygia guttata* (c. 5 g/day, Zann & Straw 1984), a non-breeding bird would need to feed for at least 6 hours per day (5 g/day at 13.8 mg/min), possibly much longer. This is nearly twice as long as Zebra Finches have to feed in Victoria (Zann & Straw 1984). This period of low food abundance is likely to discourage Long-tailed and Masked Finches from breeding until seed availability improves.

The finches appeared to be able to feed on grass seed at lower densities than those exploited by Hooded Parrots. At one site where both parrots and finches were feeding on fallen spinifex seed only the finches remained a week later, the parrots having switched to non-grass food. This may be because the pointed bill of the finches is better suited to probing for seeds from the gravel substrate than is the hooked beak of the parrot, or because the finches' total food requirement is lower than that of the parrot, allowing the finches to tolerate a lower rate of feeding success.

Gouldian Finch

Gouldian Finches were seen to feed on Cockatoo Grass in mid December (5-12

finches on 7 days) and Curly Spinifex in early January (3-7 finches on 2 days). In late January, when no grass seed on standing stems appeared to be available in the area, no Gouldian Finches were seen. Gouldian Finches have not previously been reported eating spinifex seeds, but have been observed eating Cockatoo Grass seeds in the Yinberrie Hills at the start of the breeding season in March (Tidemann 1992). During the present study Cockatoo Grass appeared to have at least two main seeding times, possibly depending on the time at which the soil first becomes saturated; plants on the poorly drained flats set seed three months earlier than those on the well-drained stony hillsides. Gouldian Finches appear to take advantage of this extended seed availability, thus remaining near the breeding site for as long as food is available (Tidemann 1992).

To take seed still on the stem, a finch usually landed halfway up the stem and then edged along it until the seed head was reached, often after the grass stem had bent under the finch's weight. They were never seen to take fallen seed, although at the same time individuals of other finch species were seen feeding on the same food type from the ground.

Conclusions

These observations confirm that the early wet season is a time when seeds, particularly those of grass species, are scarce. Although generalists, such as the Peaceful Dove and the Hooded Parrot, are able to switch food sources when grasses are unavailable, finches may be more restricted in their dietary choices. This makes these species particularly vulnerable. All the seed-eating species discussed here would be adversely affected by any loss to already scarce early-wet-season food types. As the site used here is near one of the few known breeding sites of the Gouldian Finch, the disappearance of any of its wet-season foods from the vicinity could have adverse consequences for the survival of the species. Rigorous studies of the wet-season diet of the Gouldian Finch are essential to ensure that land management is not inimical to year-round food availability for the species.

Acknowledgements

We are grateful to the following people for their help during this study: Patrick Carmody, John Woinarski & Annie Wells, Jeremy Russell-Smith & Dianne Lucas, and Sonia Tidemann. Sonia Tidemann, John Woinarski and Richard Zann provided helpful comments on the manuscript. Research in Kakadu National Park was conducted under Permit RK-244; transport costs in the Northern Territory were funded by the Conservation Commission of the Northern Territory. The research was conducted as part of a larger program on the Golden-shouldered Parrot which is being supported by the Queensland Department of Environment and Heritage and the World Wide Fund for Nature (Australia).

References

- Frith, H.J., Wolfe, T.O. & Barker, R.D. (1976), 'Food of eight species of Columbidae, in the genera *Geopelia*, *Phaps*, *Geophaps* and *Petrophassa*', *Aust. Wildl. Res.* **3**, 159-171.
- Garnett, S.T. & Crowley, G.M. (in press), 'The feeding ecology of the Hooded Parrot in the early wet season', *Emu* **95**.
- Read, J.L. (1991), 'Consumption of seeds by Red-browed Firetails *Neochmia temporalis* at feeders: dehusking rates and seed choice', *Corella* **15**, 19-23.
- Tidemann, S.C. (1992), Conservation of the Gouldian Finch, N.T., Final Report to World Wide Fund for Nature, Project Number P136.
- Woinarski, J.C.Z. & Tidemann, S.C. (1991), 'The bird fauna of a deciduous woodland in the wet-dry tropics of northern Australia', *Wildl. Res.* **18**, 479-500.
- Zann, R. & Straw, B. (1984), 'Feeding ecology and breeding of Zebra Finches in northern Victoria', *Aust. Wildl. Res.* **11**, 533-552.