

16. HOW TO SUPPORT THE RECRUITMENT OF MALLEEFOWL *Leipoa ocellata* IN SMALL REMNANTS: AN OVERVIEW OF PROJECT FINDINGS

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Abstract

After emerging asynchronously from the nest mound, the chicks of the Malleefowl *Leipoa ocellata* (Megapodidae) disperse independently. Malleefowl chicks are thought to lead solitary lives until reaching maturity at three to four years of age. Very little is known of the dispersal, behaviour and habitat requirements of young Malleefowl during this period, particularly in a landscape of small habitat remnants. By radio tracking chicks and captive-raised young birds, it was possible to gather new information on young Malleefowl that may be used to inform management of small remnants, and have implications for large reserves. Findings include social interactions among young birds, dispersal and movements within the habitat, causes of mortality and recruitment events.

Introduction

After emerging asynchronously from the nest mound, the chicks of the Malleefowl *Leipoa ocellata* disperse independently. Malleefowl chicks are thought to lead solitary lives until reaching maturity at three to four years of age. Very little is known of the dispersal, behaviour and habitat requirements of young Malleefowl during this period, particularly in a landscape of small habitat remnants. In this paper, I will present some findings of particular interest from a study of Malleefowl chicks and juveniles including survival, social behaviour and recruitment events.

Methods

This study was conducted in the southern wheat belt shire of Gnowangerup in Western Australia. Two study sites were used. Foster is a 138 ha privately owned bush block, and Tieline is a 128 ha Department of Environment and Conservation Nature Reserve. Both remnants have a similar history being undisturbed since isolation by clearing for agriculture. Fox baiting is carried out once annually and is highly localised.

Eggs were collected from mounds at the study site and artificially incubated. The chicks were randomly assigned to two groups. The first were released at a few days of age once they had regained their hatch weight. The second group were captive raised in individual enclosures and released as juveniles. Radio-transmitters were attached using a simple backpack harness of two wing loops of 5mm black cotton tape (Benshemesh 1992; Priddel & Wheeler 1994). The birds were radio-tracked on foot. Releases occurred over three seasons; 2004/05, 2005/06 and 2006/07.

Results

These results are a selection of findings of particular interest from the study of Malleefowl chicks and juveniles. They include survival, social behaviour and recruitment events.

Survival

In examining the survival and causes of mortality in young Malleefowl, one of the aims of the study was to identify the critical age for chicks where survival is significantly increased. The fate of chicks and juveniles released at varying ages was recorded. As expected, there was a high rate of mortality in the first two weeks of life. However survival significantly increased for juveniles of 45 to 50 days of age (Figure 1).

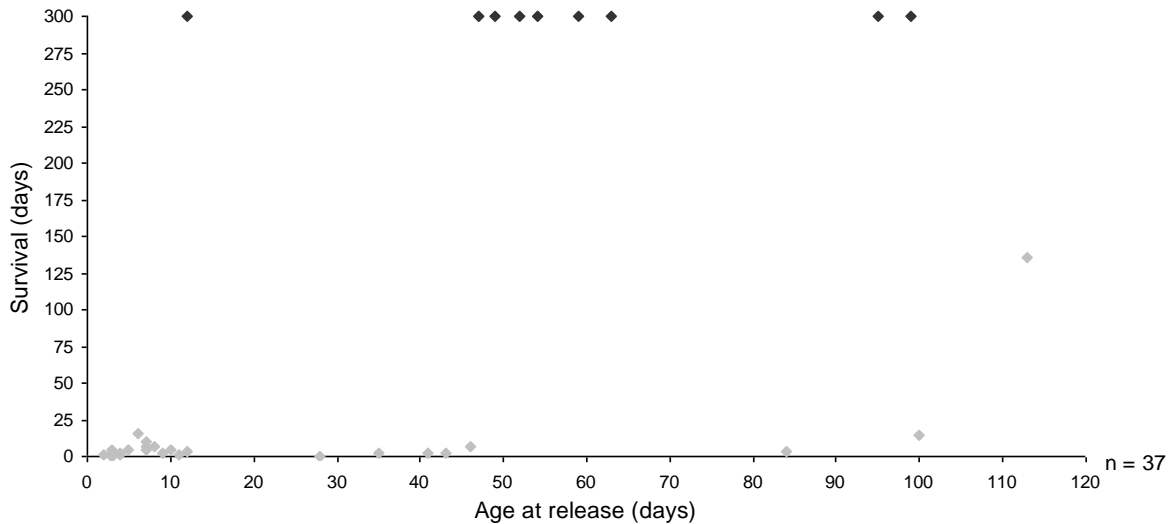


Figure 1. Survival of chicks released at differing ages. Black points indicate chicks survived a minimum of 300 days.

Introduced predators were the major cause of mortality among juveniles, followed by raptors. Of particular interest was the mortality of two chicks that, upon autopsy, appear to have died of head trauma. The birds' internal organs appeared normal and healthy, the body condition was good and the crop and gizzard full.

Malleefowl chicks have a larger suite of predators than juveniles, being taken by Varanids (goannas) and Artimidae (Currawongs/Butcher birds) in addition to introduced predators and raptors. Figure 2 presents the breakdown of the causes of mortality. An equal proportion of chicks were killed by introduced predators (38%) and by native aerial predators (38%). Native ground predators accounted for 10% of mortalities. Though only a low proportion of mortalities were directly attributed to starvation, it is well known that this can be a major factor for the survival of chicks (Priddel & Wheeler 1990; Benshemesh 1992). Where possible, remains after predation were examined to determine the physical condition of the chick. In most cases, however, there was insufficient remaining.

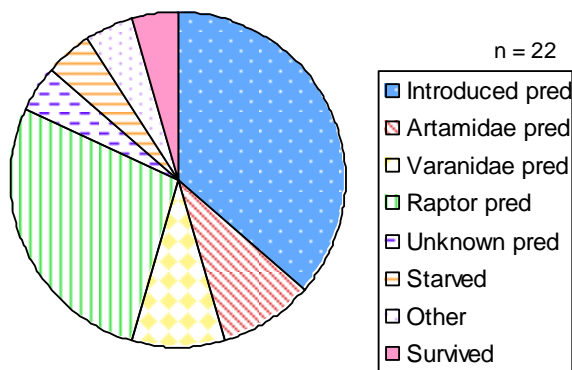


Figure 2. Fate of chicks released

The increased rate of survival at 45 to 50 days would be the result of the size of the chick, its level of physical development, and its increased skills for foraging and predator avoidance. Malleefowl chicks grow and develop quickly. From an average 112 grams at hatching, by 45 to 50 days, they are around 300 grams (Figure 3).

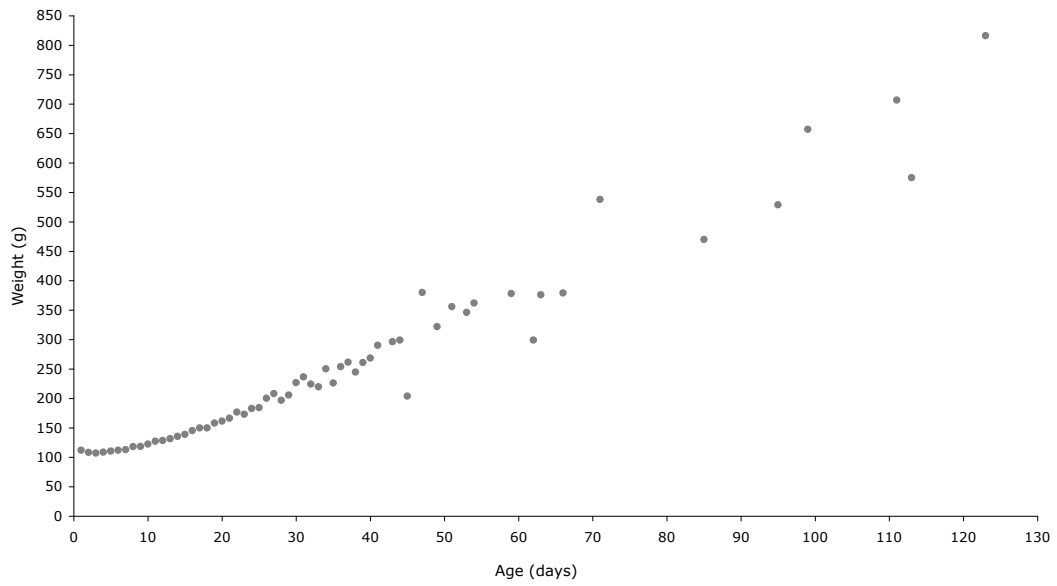


Figure 3. Mean weight gain in the days following hatching.

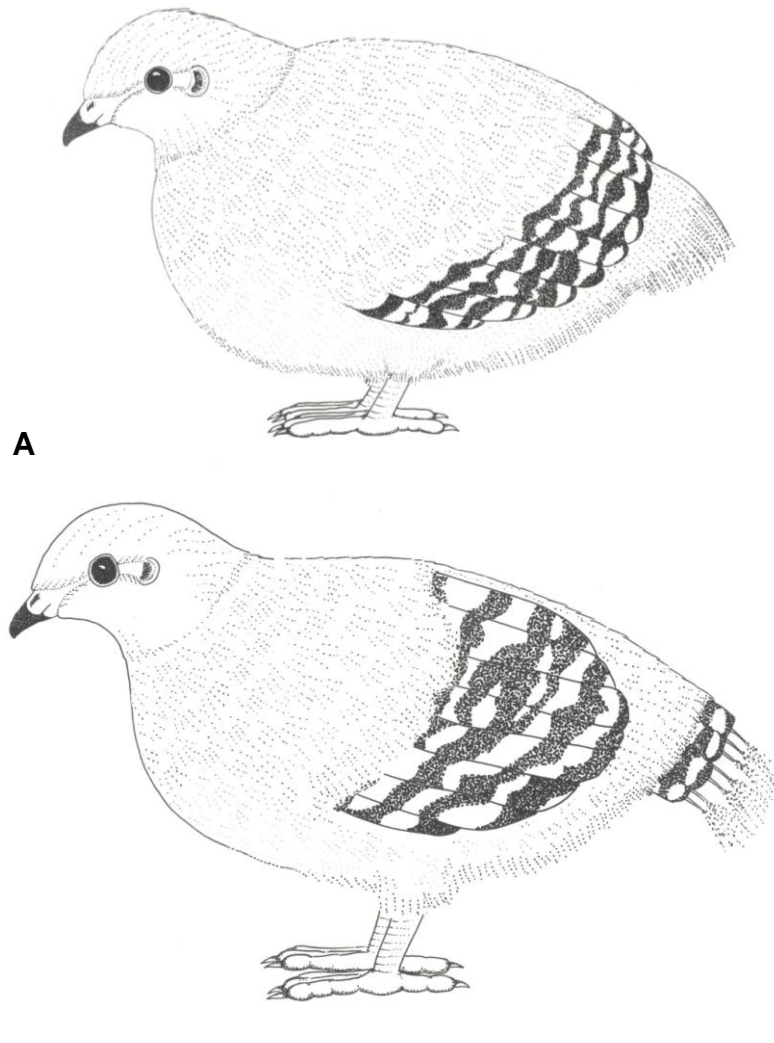
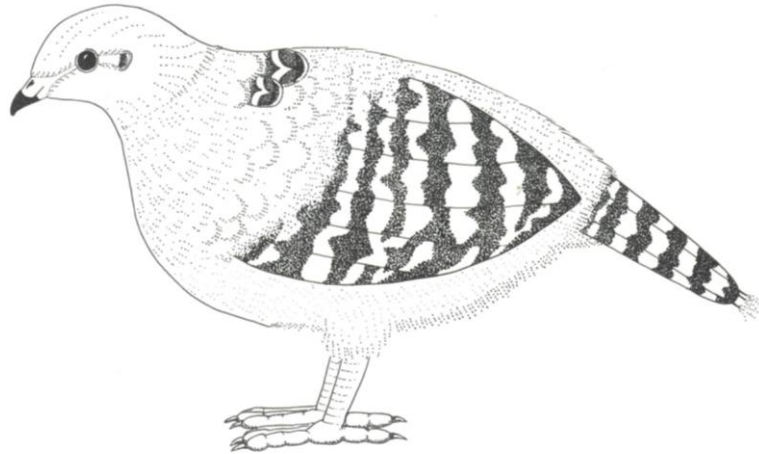
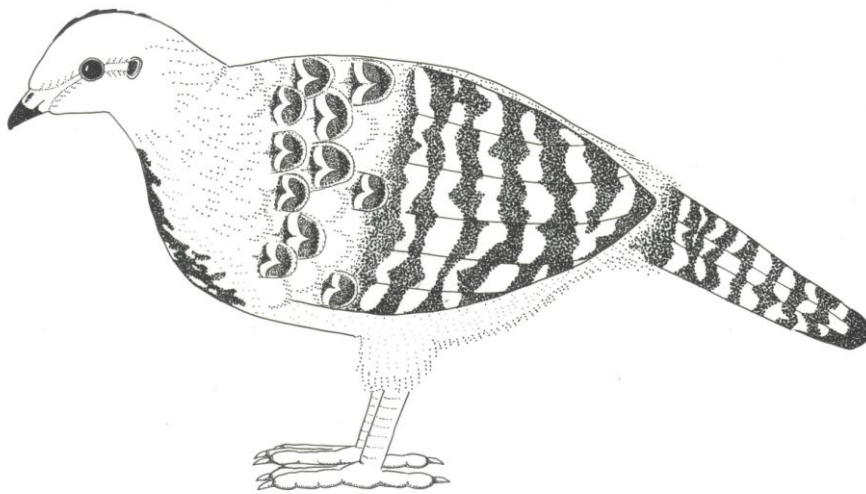


Figure 4. Chicks 1 to 14 days of age. A. 1 to 7 days of age. Nape to wingtip is approximately 10 cm. B. 14 to 24 days of age.



A



B

Figure 5. Malleefowl chick development from 23 to 40 days of age. A. 24 to 30 days of age. B 33 to 40 days of age. Nape to wingtip is approximately 18cm

They also develop quickly, with true tail feathers emerging by around 20 to 24 days (Figures 4 and 5).

Social behaviour

Social behaviour has been documented in young Brush-turkey chicks. Göth & Vogel (2002) found social interaction occurred among chicks between two days (in captivity) to four weeks of age. Mixed groups of three to six month old birds were also observed (Göth 2001).

Social interaction was not observed in Malleefowl younger than eight weeks of age in this study. Aggressive behaviour was observed in very young captive chicks of up to a week of age when two chicks encountered each other. One chick would display, lowering the head, raising the head feathers and wings (Figure 6). A loud growling vocalisation was also used. The second chick would generally flee without giving any display or vocalisation. Chick encounters were not observed in the field.

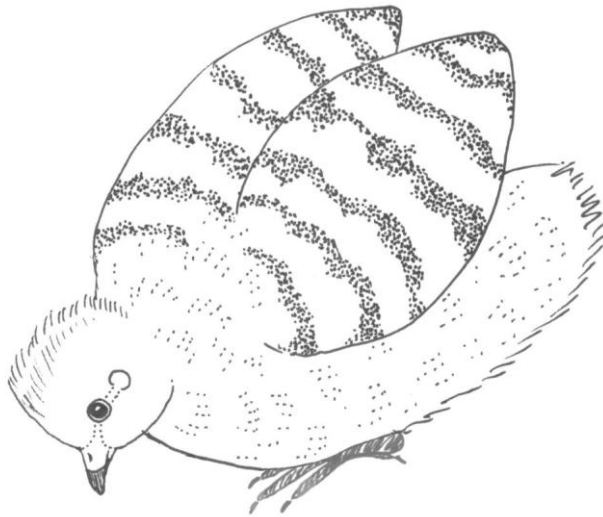


Figure 6. Aggressive display in a very young chick (three days old).

Social interaction was first observed in the field between two 10 week old juveniles in the 2004/05 season. These birds have been released two weeks apart and had moved and settled solitarily (Figure 7). After five weeks in the field, one bird (black) moved over a kilometre within the course of a morning to an area where the other bird (white) had settled in the north-eastern corner (after three weeks in the field). The birds remained together for two weeks; foraging within 20 meters and roosting within 50 meters. The interaction between the birds involved the use of visual displays, sparring and fighting, as well as vocalisations including an aerial predator alarm call and a contact call.

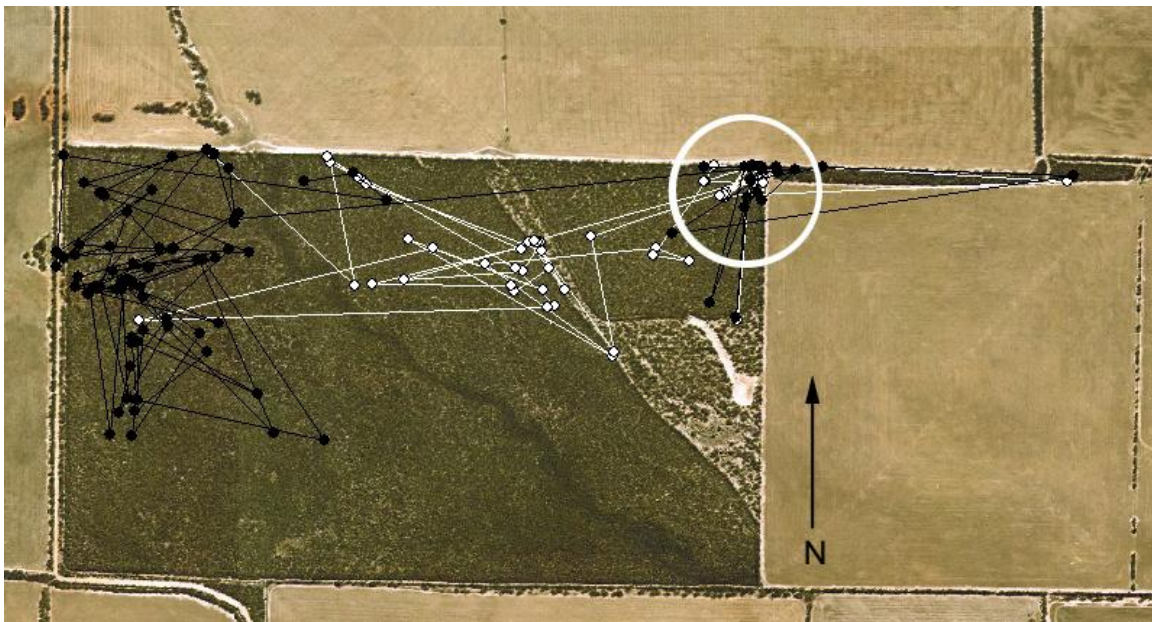


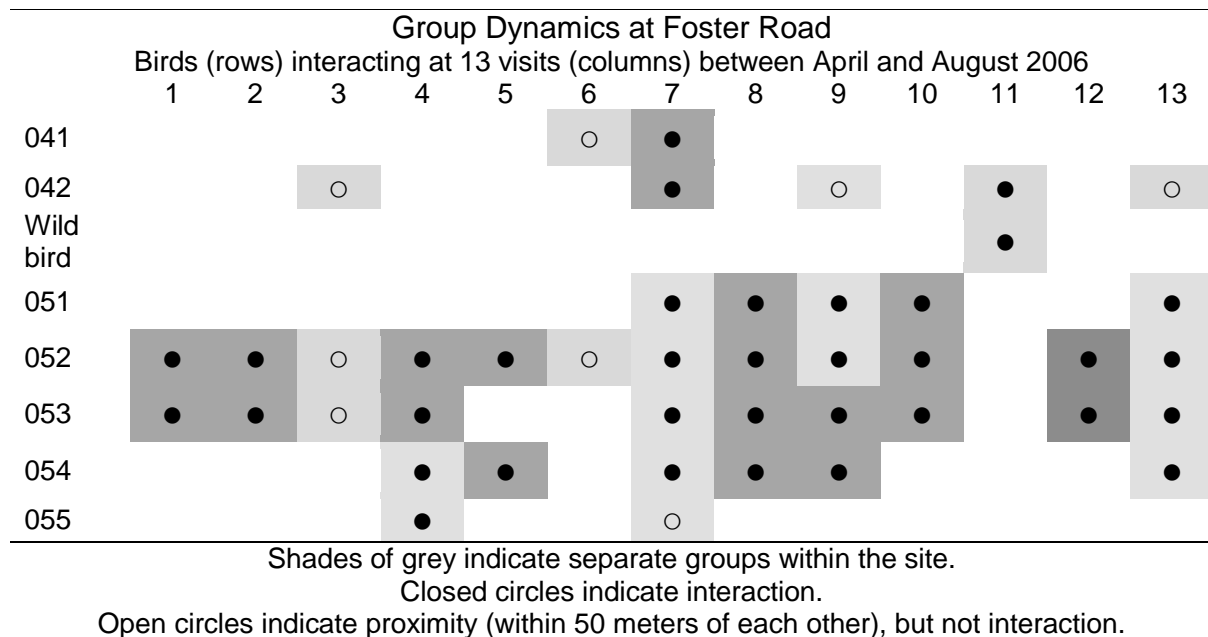
Figure 7. Movements of two juvenile birds in the 2004/05 season

For the next approximately seven months, the birds alternated between settling solitarily, and in close interaction. On two occasions, a third wild bird was seen with the pair.

In 2005/06, social groups of up to five members formed at both study sites. As with the pair in 2004/05, the groups were dynamic in membership, varying from two to five. Though no wild birds were observed with these groups, a surviving chick released at a few days of age joined a group at around 8 weeks of age. Table 1 presents the dynamics of social interaction between birds on 13 separate visits (excluding visits where all the birds were solitary). For example, on visit 7, birds 041

and 042 were located together as a pair, 051, 052, 053 and 054 were together in a group, and bird 055 was within 50 meters of that group, but not interacting with the other birds.

Table 1. Group dynamics at Foster Road between April and August 2006



Recruitment event of a young male

In late September 2005, the remains of an adult male bird were found 30 meters from one of the active mounds. The mound had been filled with litter and closed to allow the organic material to begin fermentation to generate the first stage of heat for incubation. As daily work had not yet commenced, it was not possible to observe the birds to determine if it was one of the pair.

In mid November, a radio-tracked eleven month old male was observed resting in scrub near the mound. As the mound was opened by the researcher, the young bird came onto the mound and began filling it back in. There was one egg in the mound (the mound of an established pair nearby had two eggs). Despite a poor season for breeding, at least four chicks were successfully hatched. In the following 2006/07 season, the male worked the mound again. There was a clutch of at least 12 eggs.

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