

# The loss of a brood and production of a replacement clutch in Golden Plover *Pluvialis apricaria*

*James W. Pearce-Higgins*

Pearce-Higgins, J.W. 1998. The loss of a brood and production of a replacement clutch in Golden Plover *Pluvialis apricaria*. *Wader Study Group Bull.* 85: 39-340.

*J.W. Pearce-Higgins, School of Biological Sciences, 3.239 Stopford Building, University of Manchester, Oxford Road, Manchester, M13 9PT, United Kingdom*

## INTRODUCTION AND METHODS

Golden Plovers *Pluvialis apricaria* usually produce a clutch of four eggs, laid at 48 hour intervals. Incubation lasts 30.4 days (range 28-31) (Cramp & Simmons 1983). In northern England, most eggs are laid between 10 April and 7 May (Ratcliffe 1986). Despite the large size of Golden Plover eggs (Nethersole-Thompson & Nethersole-Thompson 1986), replacement clutches can be laid following the loss of the first clutch. Replacement times have been given as 12-41 days (mean 24 days) (Parr 1980) or 12-24 days (Nethersole-Thompson & Nethersole-Thompson 1986). To date, there has been no evidence that more than one brood is produced by this species (Cramp & Simmons 1983; Nethersole-Thompson & Nethersole-Thompson 1986), but a series of observations from Snake Summit (SK0891), in the Peak District, England (see Yalden & Pearce-Higgins 1997 for a site description) suggests that this could occasionally happen.

## RESULTS

On 14 April 1997, a colour-ringed male was flushed from a clutch of four eggs in an area of Crowberry. Calculations based on egg biometrics (cf. Yalden & Yalden 1989) predicted a hatch date of 30 April and therefore the start of incubation as 31 March. On 23 April, the female was trapped using a walk-in cage trap (modified from Parr 1981), and also colour-ringed. The nest was still being incubated on 30 April, with no sign of the eggs hatching but by 4 May it was empty, with hatching chips in the bottom. Both parents were vigorously alarming nearby, indicating the presence of the brood about 50-100 m from the nest site.

On 9 and 10 May, both parents were present on the moor and, by their anxious behaviour (cf. Yalden & Yalden 1991), clearly still had chicks. The area was next visited on 13 May. Despite extensive searching, the plovers were not recorded, suggesting that the chicks had died. This was confirmed by a visit on 20 May. Although both adults were present, they reacted only weakly to human presence, and were clearly not protecting a brood.

On 3 June, the same male was flushed from a clutch of four

eggs, in a mixed area of cotton grass and Crowberry, about 450 m from the first nest. By 9 June, the second nest was abandoned, a predator having broken one egg, and covered the others in yolk. The estimated start of incubation for this clutch was 27 May, again from egg biometrics. Assuming a 48 hour laying interval, and incubation commencing with the penultimate egg (Cramp & Simmons 1983; Nethersole-Thompson & Nethersole-Thompson 1986), the first egg would have been laid four days earlier on 23 May, some 10-12 days after the loss of the brood.

## DISCUSSION

It appears that this pair started laying their first clutch around 31 March, a fairly early start to the breeding season. This clutch hatched about 3 May and the chicks survived for 8-10 days. Within 10-12 days of the loss of their first brood, a second clutch began to be laid, which failed to hatch. The production of a second clutch, following the successful hatching of the first clutch but subsequent death of the chicks, appears not to have been previously recorded for Golden Plovers. Parr (1980) stated that replacement clutches are laid for about half of the nests lost, but makes no mention of relaying following the loss of a brood. Both Cramp & Simmons (1983) and Nethersole-Thompson & Nethersole-Thompson (1986) state that Golden Plovers are single-brooded. If the second nest had been successful, this male would have produced two broods. Unfortunately, the female which laid the second clutch was not seen, so the possibility of polygyny cannot be disregarded, although this behaviour has not yet been recorded for Golden Plover.

To place this record in context, during 1996 and 1997 a total of 19 other breeding attempts by colour-ringed birds around Snake Summit offered the potential for similar observations. Of these, three nests were predated during incubation (an artificially low percentage because birds from unsuccessful nests are less likely to be caught and colour-ringed), eight had broods which failed to fledge and seven successfully reared at least one fledgling. The success of one brood was unknown. Colour-ringed birds from four of the pairs that lost broods were observed in their territories 5, 5, 10 and 28 days after failure. It is therefore not unusual for failed birds to remain on the



breeding area for at least a few days following the loss of a brood. However, assessing the likely frequency of replacement clutch production in such cases is difficult, due to the low detectability of Golden Plover nests.

The laying of the replacement clutch a maximum of 12 days following the loss of the chicks is just within the minimum given by Parr (1980) and Nethersole-Thompson & Nethersole-Thompson (1986). If the same female laid both clutches, it was a remarkable achievement to produce the four, large, replacement eggs so quickly. Lapwings *Vanellus vanellus* are known to produce second clutches after the loss of a brood, particularly early in the season (Cramp & Simmons 1983), and have even been recorded attempting to produce two successive broods (Parish *et al.* 1997). However, Lapwings produce smaller eggs than Golden Plovers (Nethersole-Thompson & Nethersole-Thompson 1986), so clutch replacement is less demanding for them.

#### ACKNOWLEDGEMENTS

This work was conducted as part of a project funded by a University of Manchester postgraduate scholarship, which is gratefully acknowledged. I should also like to thank Derek Yalden and Mark Whittingham for comments on the manuscript.

#### REFERENCES

- Cramp, S. & Simmons, K.E.L. (Eds.) 1983. *Handbook of the Birds of Europe, the Middle East and North Africa: the birds of the Western Palearctic. Volume. III.* Oxford University Press, Oxford.
- Nethersole-Thompson, D. & Nethersole-Thompson, M. 1986. *Waders, their breeding haunts and watchers.* T & A.D. Poyser, Calton.
- Parish, D.M.B., Thompson, P.S. & Coulson, J.C. 1997. Attempted double-brooding in the Lapwing *Vanellus vanellus*. *Bird Study* 44: 111-113.
- Parr, R. 1980. Population study of Golden Plover *Pluvialis apricaria* using marked birds. *Ornis. Scand.* 11: 179-189.
- Parr, R. 1981. Trapping and colour-ringing of Golden Plovers in north-east Scotland. *The Ring* 108-109: 244-246.
- Ratcliffe, D.A. 1976. Observations on the breeding of the Golden Plover in Great Britain. *Bird Study* 23: 63-116.
- Yalden, D.W. & Pearce-Higgins, J.W. 1997. Density-dependence and winter weather as factors affecting the size of a population of Golden Plovers *Pluvialis apricaria*. *Bird Study* 44: 227-234.
- Yalden, D.W. & Yalden, P.E. 1989. Estimating the date of hatching of eggs of Golden Plover *Pluvialis apricaria*. *Wader Study Group Bull.* 55: 19-20.
- Yalden, D.W. & Yalden, P.E. 1991. Efficiency of censusing Golden Plovers. *Wader Study Group Bull.* 62: 32-36.

