The trapping of breeding Golden Plovers using a simple walk-in trap

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Yalden, D.W. & Pearce-Higgins, J.W. 2002. The trapping of breeding Golden Plovers using a simple walk-in trap. *Wader Study Group Bull.* 98: 38–40.

A simple walk-in trap, constructed of Weldmesh©, was used to catch incubating Golden Plovers. Of 62 attempted catches, 45% were successful. Success was greatest during the morning, and increased slightly with the length of time the trap remained on the nest. Trapping did not increase the likelihood of predation (although the site was a well-managed grouse moor, with few predators) and there were no desertions.

INTRODUCTION

To catch Golden Plovers *Pluvialis apricaria* for colour-ringing and radio-tagging for a Ph.D. study (Pearce-Higgins 1999), we needed a simple, transportable, trap that could be used to catch incubating birds, on moorland nests anything up to 4 km from the nearest road access. Parr (1981) described the trap that he used in a similar study, but it was rigid with a complex door mechanism. We describe a simpler trap design that worked well over three field seasons.

TRAP DESIGN

Our trap was made from two sheets of light-gauge Weldmesh©, with 1" (2.5 cm) square mesh. The top of the trap, 36" × 22" (90 × 55 cm), required most of one sheet (Fig. 1). Two side pieces, 36" × 12" (90 × 30 cm), and a back, 22" × 12" (55 × 30 cm), were hinged lightly to the top by binding them together using a green plastic-covered gardening wire. Two front pieces, each 16" × 11" (40 × 27.5 cm), were similarly bound to the front edges of the side pieces. An oblong hole, 12" × 10" (30 × 25 cm), was cut in the top for access/handling, closed by a similarly hinged flap 13" × 10" (32.5 × 25 cm). These sections could all be folded flat onto the top for carrying, wrapped in a large plastic sack. The light gauge was flexible enough to be bent around tussocks of cotton-grass but somewhat stronger than chicken-mesh. The 1" mesh was light enough, both to carry and optically, to be relatively unobtrusive when set in place.

The trap was erected by using two ties each side (green plastic-covered wire) to hold the sides to the back. Three or four similar ties were used to hold the front pieces in an arc to the top, creating a recurved entrance (Fig. 1), and one was used to keep the lid closed over the access hole. The trap was set over the nest, with the nest toward the back of the trap, but of necessity fitted to the terrain. We inspected the nest site to try to interpret the Golden Plover's usual access route (indicated by a lightly trodden or sunken path between the tussocks of vegetation), and set the entrance over this. Where the trap, once set, did not touch the ground tightly, we used extra tussocks of cotton-grass or similar plants to block possible escape holes. Tent pegs or skewers were used to hold it firmly in place.

When approaching a nest to set the trap, the incubating bird invariably flew off, away from us. Having set the trap, which normally took no more than 5 minutes, we usually walked on in the direction the bird had flown for at least 500 m, before turning off to left or right, getting well below the skyline, and then working our way back to about 500 m beyond the nest. We then waited out of sight until about 40–45 minutes had elapsed since the bird was flushed from its nest, before re-approaching the nest, towards the open entrance of the trap, on our original line. This pushed the bird into the back of the trap. A glove in the entrance prevented the bird from escaping, but in fact it never went towards either the entrance or the access hole. It typically took up to 45 minutes to ring and radio-tag the bird, during which time we covered the eggs with a hat or scarf, removed the trap, and moved a few metres away to avoid drawing attention to the nest site. In cases where we caught the adult while brooding chicks, we kept the chicks in a bird-bag within our shirts, to ensure that they were kept warm.

TRAPPING SUCCESS

Of 62 trapping attempts, involving 30 nests and potentially therefore 60 birds, we were successful on 28 occasions (45% success rate), ringing 20 males and 8 females. On two more occasions, birds entered the trap but escaped before capture; one male escaped beneath the back of a poorly secured trap, and another escaped through the entrance as we misjudged our approach to the trap in low cloud. In at least two failures, birds were seen near the trap, but could not find the entrance, and presumably we had not located their habitual approach correctly. In most failures, we did not see the bird near the trap, and presume that it did not return within the time allowed, or returned but was disturbed by the presence of the trap.

The importance of date, time of day and duration of trapping attempt in determining success was tested using the

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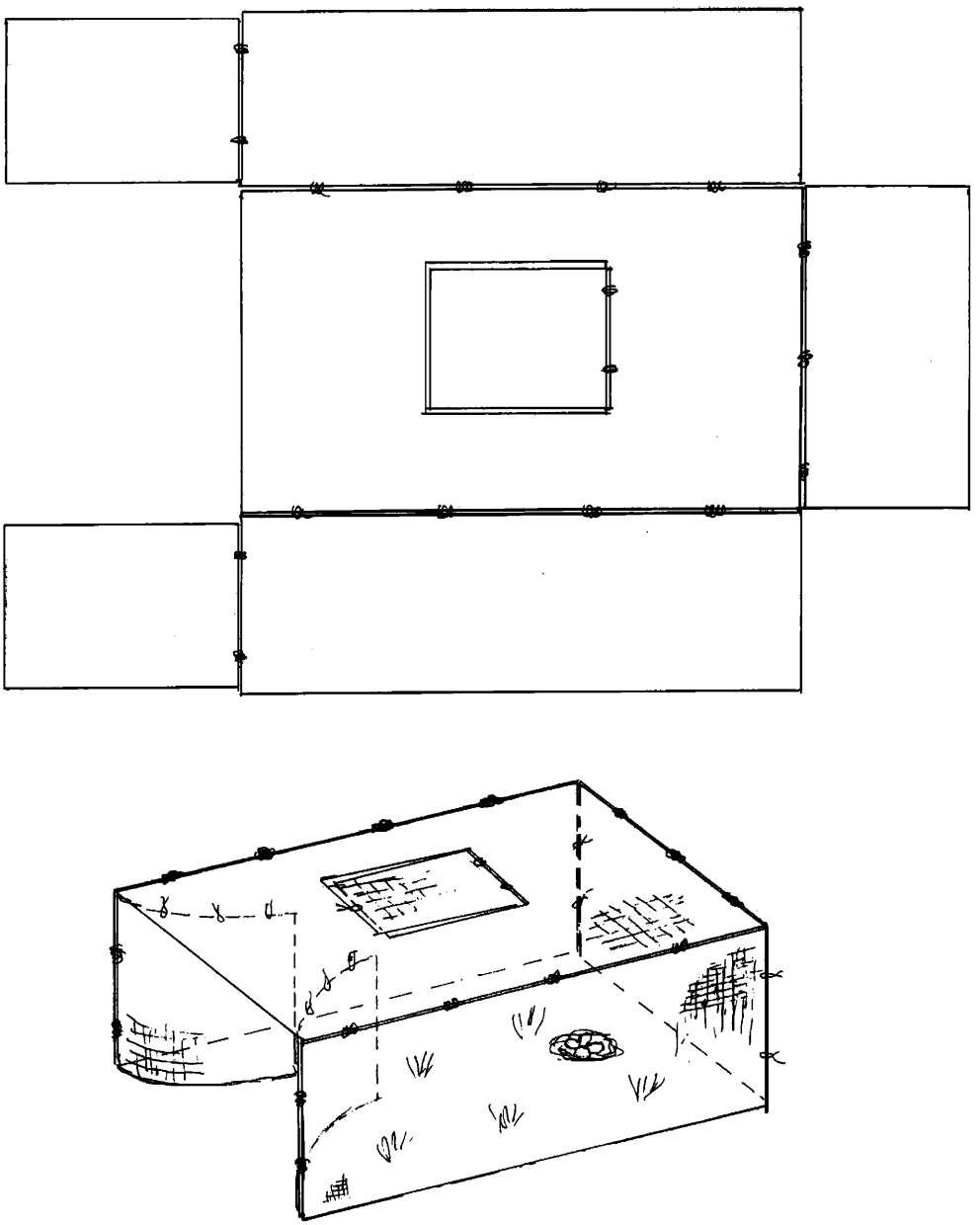

Fig. 1. Sketch of trap, both flat and as erected.

procedure GENMOD in SAS (SAS Institute 1997), with a binomial error distribution. The likelihood of capture was negatively correlated with time of day ($\chi^2 = 4.98$, $P = 0.026$), with the most successful capture attempts made in the morning, averaging a 64.5% success rate, whilst only 32.3% of attempts made in the afternoon and evening were successful (Fig. 2). The duration of the trapping attempt (which ranged from 10 to 70 minutes depending upon ambient conditions) was weakly, positively, correlated with capture success ($\chi^2 = 3.37$, $P = 0.067$), although this effect was non-significant after accounting for time of day ($\chi^2 = 1.80$, $P = 0.180$). The shortest duration of a successful trapping attempt was 20 minutes.

To examine whether catching attempts influenced the likelihood of subsequent predation, we calculated the daily probability of nest survival (Mayfield 1975) separately for the periods following a normal visit, a successful trapping attempt, or a failed trapping attempt. Following a normal visit this was 0.981, compared to 1 for successful trapping attempts and 0.983 for unsuccessful trapping attempts. Attempting to catch adults on the nest therefore did not increase the likelihood of nest predation. None of the nests was deserted following trapping. Although most trapping was attempted during the final two weeks of incubation, attempts were made at six nests within the first ten days.

DISCUSSION

There has been some discussion of whether waders are too timid, and liable to desert, for nest trapping to be acceptable (Kania 1996). The general conclusion seems to be that trapping in the first half of incubation poses more risk than later, but for most species sample sizes are small. Kania's table included only 4 Golden Plovers, half of which deserted, but all were in early incubation. In previous work, DWY had one case of a nest being deserted after being found by a dog dur-

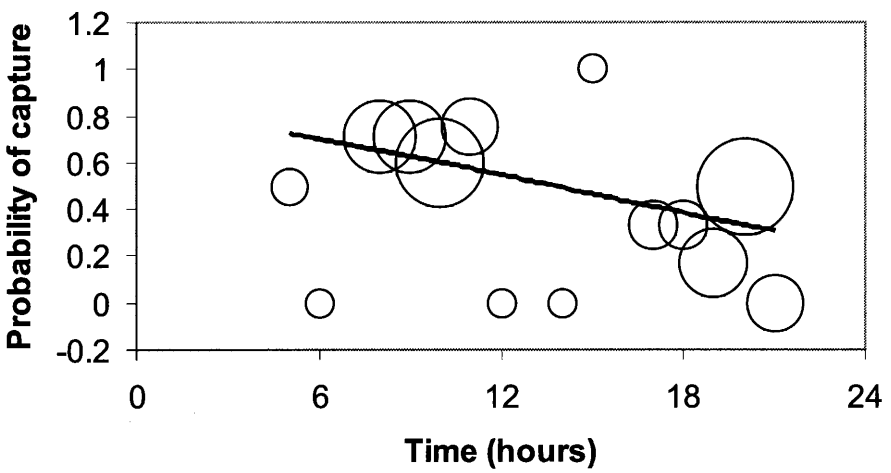

Fig. 2. Variation in the success of captures using the walk-in trap with time of day. Each circle represents the mean probability of capture for trapping attempts within a particular hour. The size of the circle indicates the number of trapping attempts within each hour, and therefore the weighting that each data point received in the analysis.

ing laying (at only the 2-egg stage). This prompted us to avoid the early stages of incubation, and we had no indications of any direct adverse effects of our trapping activities. It may be that predation risks were lowered because we were working on well-kept grouse moors, with reduced numbers of predators. Parr (1981) also reported that none of the 31 Golden Plovers he handled deserted their nests, though he had two cases where embryos died and clutches failed; these were due to other causes keeping the adults from resuming incubation for extended periods. We avoided trapping in the middle of the day, because our study site is a popular recreational area where we could not be sure that birds would be able to return to their nest (the presence of other people on the moor has been shown to delay the resumption of incubation; Yalden & Yalden 1990)

Our relatively simple trap worked well, in these circumstances, and avoided complications with trip mechanisms which can fail in more complex designs. The obvious risk with such a simple design is of birds walking back out of the entrance, but we were aware of only one failure due to this, and poor weather was partly to blame. The other failures would have been just as likely with more complex traps. The use of Weldmesh made it simple to cut the panel sizes, though chicken-mesh surely could be used to construct something similar. Weldmesh when cut with pliers can be very sharp-edged, and some attention to the cut edges with a fine file is strongly advised. A similar but smaller, more rigid, walk-in trap has also been used successfully to catch Common Sandpipers *Actitis hypoleucos* hunting along the shorelines of reservoirs in the Peak District.

The variation in trapping success through the day was probably a result of the incubation schedules of Golden Plovers, in which the males incubate during the day from about 08:50 until 20:24 (Pearce-Higgins & Yalden in press.). During the morning, immediately following a changeover, males probably experienced a strong incubation drive. However, in the evening, our latest trapping attempts would have coincided with both birds being on territory (Byrkjedal & Thompson 1998, Pearce-Higgins & Yalden in press), and with a changeover expected, birds may have been less motivated to return to the nest.

In summary, nest-trapping is perfectly feasible, even in the very open habitats occupied by this species, and need not cause extra desertion or predation. It probably pays to trap only during the second half of incubation. Care should be taken to avoid extending the interruption to incubation by not trapping when other people might be on the moor. Early morning is likely to be more successful than late in the evening, but it may be essential to trap late in order to catch females. We have no experience of trapping overnight, but handling rings and radios in the dark would be problematic, and might cause the females to desert.

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