Corella, 2002, 26(4): 114–115

A SIMPLE TRIGGER MECHANISM FOR PHOTOGRAPHING PREDATORS AT ARTIFICIAL GROUND NESTS

FIONA FRASER[1] and KEN I. FRASER[2]

[1]Tropical Savannas Co-operative Research Centre and Parks and Wildlife Commission of the Northern Territory, Darwin, Northern Territory 0836 and Centre for Resources and Environmental Studies, Australian National University, Canberra, Australian Capital Territory 0200
Present address and correspondence to: 21 Mullen Gardens, Alawa, Northern Territory 0810
[2]Wilcar Avenue, Waubra, Victoria 3352

Received: 19 September 2000

Artificial bird nests are a useful, easily manipulated means of testing various hypotheses relating to nest predation. The subject is of much interest to bird ecologists given the often crucial role played by nesting mortality in the recruitment rate of many bird species (Ricklefs 1969). Predators responsible for nest mortality are rarely identified however, in either artificial nest studies or studies of natural nest predation (Major and Kendal 1996). A knowledge of predator identity can add a new dimension to our understanding of the nesting ecology of bird species and the predation pressures experienced. However, identification of predators can add a costly and time consuming dimension to artificial nest studies, which are popular in part due to their simplicity and relative ease of execution.

The trigger mechanism described here was designed to photograph predation events at artificial nests intended to mimic those of a ground dwelling Australian savannah species, the Partridge Pigeon *Geophaps smithii*, which construct simple ground nests. Other simple camera trigger designs exist but appear to be more suitable for arboreal nests, are more complex, labour intensive or costly (e.g. Picman 1987; Savidge and Seibert 1988; Major 1991; Laurance and Grant 1994; Major and Gowing 1994). The camera setup described by Major (1991) suited our requirements and was adopted, but the trigger mechanism was unsuitable as it was designed for arboreal nests. Consequently a simple and cheap trigger mechanism for photographing predators at artificial ground nests was designed and is described here.

DESCRIPTION OF THE TRIGGER MECHANISM

The trigger mechanism is comprised of five main components: a mouse or rat trap, at least eight small wire stakes, flexible plastic tubing, fishing line or equivalent, and protective covering for the mouse trap. Major's paper (1991) should be referred to for more detail regarding the camera setup; but in brief, the equipment required for the camera setup is: a camera (we purchased A$30 cameras with built in flashes; however, disposable cameras could also be used), two rubber bands, a lever and small prop and protective housing or roofing. Except for the egg, the above items are all that are required. Partridge pigeon nests were mimicked by making a shallow scrape (<1 cm) in the ground and lined with a few strands of herbage.

The mouse trap trigger mechanism is shown in Figure 1. The mouse trap was pegged with wire stakes into a shallow depression in the ground. One piece of fishing line connected the snap arm of the trap to the camera trigger (b, Fig. 1). A second line connected the bait plate of the trap to the egg (we used a Japanese Quail egg), looped around a wire stake placed just beyond the egg and reattached at the bait plate (c, Fig. 1). The fishing line had sufficient tension to trigger the trap with slight movement of the egg and the loop ensured that the trap would be triggered regardless of the direction of movement of the egg (even toward the trap). To attach the line to the egg we glued a small piece of calico cloth to the egg and allowed it to dry. We then glued the calico to the egg which was adhered to the calico shown at (d) in Figure 1. We placed the egg approximately 40 centimetres from the mouse trap. A thin piece of padding attached to the mouse trap where the snap arm hits the trap will quiet the action of the trap and may reduce the likelihood of startling a nest predator if the trap is triggered.

The fishing lines attached to both the snap arm and the bait plate were encased in plastic tubing (0.5 mm aquarium tubing) and secured to the ground with wire stakes to ensure that action of the trap was not hampered by soil or debris obstructing movement of the fishing line. The tubing also reduces the likelihood of accidental triggering by wind blown debris or by animals. We dug a shallow trench for the tubing and secured it with spare wire pegs before covering it with soil, which made it less conspicuous. The tubing was terminated along the fishing line attached to the snap arm (b, Fig. 1) after approximately 50 centimetres, after which the line ascended sharply to the camera trigger mechanism.

A protective cover was placed over the mouse trap (we used an upturned plastic take-away food container, not shown in Fig. 1) which was deep enough to allow clearance for the snap arm of the trap and sprinkled with soil to make the trap less conspicuous. The cover also prevents animals accidentally stepping on the trap and triggering it or injuring themselves. With the trigger mechanism now in place, all that remained was for the camera to be set up following Major (1991). We attached the camera securely to a nearby tree to prevent movement when triggered.

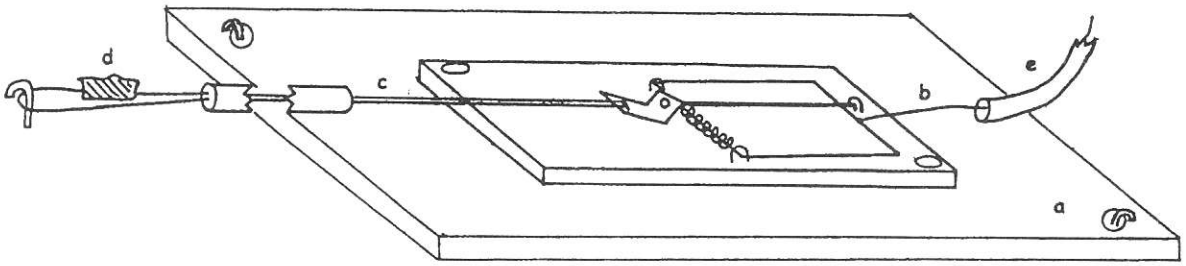

Figure 1. *Main components of the mouse trap trigger mechanism; (a) mouse trap attached to base board, secured firmly to the ground, (b) trigger line leading from snap arm of the mouse trap to camera trigger (not shown, see Major 1991), (c) loop trip line connecting bait plate of the mouse trap to the egg, (d) cloth attached to trip line, adhere egg to cloth, (e) protective tubing for fishing line.*

The mouse trap trigger mechanism described here was designed for use at ground nests. With some adjustments to layout, we believe it could also be used to photograph predators at artificial arboreal nests.

ACKNOWLEDGMENTS

This work was done as part of a PhD degree and funded by the Tropical Savannas Co-operative Research Centre and the Parks and Wildlife Commission of the Northern Territory. We thank the Traditional Owners within Kakadu National Park and Parks Australia North for permission to conduct research within the Park. Thanks to D. Franklin for comments on an earlier draft of this manuscript.

REFERENCES

Laurance, W. F. and Grant, J. D. (1994). Photographic identification of ground-nest predators in Australian tropical rainforest. *Wildl. Res.* **21:** 241–248.

Major, R. E. and Gowing, G. (1994). An inexpensive photographic technique for identifying nest predators at active nests of birds. *Wildl. Res.* **21:** 657–666.

Major, R. E. (1991). Identification of nest predators by photography, dummy eggs, and adhesive tape. *Auk* **108:** 190–195.

Major, R. E. and Kendal, C. E. (1996). The contribution of artificial nest experiments to understanding avian reproductive success: a review of methods and conclusions. *Ibis* **138:** 298–307.

Picman, J. (1987). An inexpensive camera setup for the study of egg predation at artificial nests. *J. Field Orn.* **58:** 372–382.

Ricklefs, R. E. (1969). An analysis of nesting mortality in birds. *Smithsonian Contrib. Zool.* **9:** 1–48.

Savidge, J. A. and Seibert, T. F. (1988). An infrared trigger and camera to identify predators at artificial nests. *J. Wildl. Manag.* **52:** 291–294.