FALL-NET TRAP AND PATAGIAL TAG MARKING FOR LIVE NAMAQUA SANDGROUSE

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Studies of migration, nomadism, dispersal, gregariousness and other behavioural patterns or systems of Namaqua Sandgrouse *Pterocles namaqua* require the capture and marking of individual birds. Large scale ringing operations are also required for the studies of survival and fecundity rates that are necessary in order to develop a harvest strategy appropriate for the Namaqua Sandgrouse (Malan, Little & Crowe 1993, 1994).

Mistnets placed around watering sites in the flight paths were successfully used to capture live Namaqua Sandgrouse (Lewis 1989). However, when large numbers of birds (>10) were caught, the time spent in the nets before the last individuals were removed was apparently too long, subjecting these birds to excessive capture stress. Sandgrouse are known to have an anxious disposition and some have difficulty in flying after release (Maclean & Fry 1986; GM pers. obs.). For marking individual sandgrouse, Lewis (1989) tried different colour dyes, but these dyes faded and were not visible after a short period (<8 days). We attached patagial tags to the wings of sandgrouse using a plastic welding rod, but the time required to attach the tag (approximately 10 minutes) was too long. The purpose of this communication is to describe capture and marking techniques whereby Namaqua Sandgrouse can be captured at watering points, marked, held in captivity if necessary, and released in as short a time period as possible. We also provide some measure of capture success for this technique, and information on the durability of the tags, as well as the effects of tagging on the birds' behaviour.

Watering sites visited by Namaqua Sandgrouse in the Northern Cape Province are most often permanent watering points, such as leaking troughs or small cement storage ponds, as opposed to ground dams or even rivers than run dry (GM pers. obs.). The cement ponds are less than 2 m in diameter and provide sandgrouse with high quality water (Malan, Little & Crowe 1992). The ponds are further placed in the open as to present the birds with a clear view of possible aerial predators. We designed a fall trap (Bub 1991) for the capture of sandgrouse at these types of watering points.

The fall-trap is constructed of a rectangular 2,1 x 4 m metal frame with mistnetting stretched over it. The sides of the frame are 2,1 m light aluminium mistnet poles, while the raised length of the frame is a 4 m mistnet pole. A 9 x 2,1 m (30 mm mesh) mistnet was stretched over the frame, rolled up on one side. To set the trap, the two side poles of the frame must be secured at the bottom, by connecting them to 30 cm pegs driven into the soil. The poles must swivel around these connecting points to provide the frame with leverage and stability. The frame is raised to a position about 60-80° from horizontal, with the base of the mistnet as close as possible to the water's edge. The angle of the frame should 'face' in the direction from which the majority of sandgrouse approach the watering point. Two thin strings were attached to the top frame, 0,5 m from the corner, and hooked on a trigger peg 50 m behind the frame, *i.e.* opposite the direction the frame is facing. This was done because sandgrouse walking up to the watering point tend to approach in the opposite direction to that of the hide, e.g. a vehicle covered with hessian.

When a flock of sandgrouse walked up to the water's edge (under the frame), the strings are unhooked at the trigger peg and the frame falls

over the birds. Using this technique, it took less than five minutes to remove the captured birds from underneath the mistnet. If more birds are caught than the field officers can deal with, then the sandgrouse should be held in captivity in a specially constructed holding box. This box should be made of welding mesh (1 x 1 cm), 30 cm high, 60 cm wide and 100 cm long. The welding mesh is used to provide maximum ventilation for the birds. Since sandgrouse tend to injure themselves in an unprotected enclosure by jumping against the roof (GM pers. obs.), a 5 cm thick layer of foam rubber, punched full of small ventilation holes, was attached to the walls and roof of the box.

Patagial tags were oblong in shape (2 x 3 cm) and were made of PVC Nylon. Figures (e.g. stars, crosses, dots, circles) made from the same material, were glued in advance onto both sides of the patagial tag as a figure-colour combination code visible from most observation angles. To increase the number of code combinations, different coloured figures were used on different colour backgrounds. Furthermore, by either tagging the birds on the left or the right wing, the number of code combinations can be doubled. A Swiftacher Tool (Hi-Muar Systems (Pty) Ltd, 10, cnr 4th & Marconi St, Montague Gardens, 7442) was used to attach the tag to the wing. The hollow needle of the Swiftacher Tool was pushed through the patagium and a 19 mm plastic attachment (Swiftachment: Hi-Muar Systems) was 'shot' through the needle and double-looped through the tag (Figure 1). Using this technique, it took approximately one minute to ring, tag, and release an individual sandgrouse.

To study the durability of the tags and the effects of the marking on the birds, captures were undertaken at Rooipoort (28°38'S, 24°17'E) and also at Plaatjiesdam (28°42'S, 22°34'E) during May-June 1992. In all, 7% (n = 102 at Rooipoort and 865 at Plaatjiesdam) of birds arriving at the watering points at Rooipoort and Plaatjiesdam were caught. Of these we tagged 36 individuals of which 16 individuals did not fly, but walked off after release. A large proportion of the birds landed in the water after the fall-net was dropped, therefore it was difficult to distinguish between those suffering from capture stress and those too wet to fly. During counts conducted for eight days after capture, five individuals released at Rooipoort and six individuals at

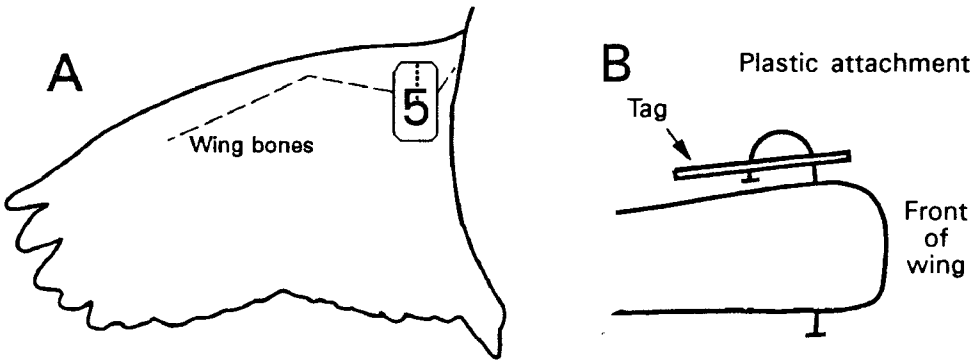

Figure 1. Location of patagial tag on the dorsal side of the wing (A) and showing the positioning of the plastic attachment through the patagium and tag (B).

Plaatjiesdam, were resighted. Although we only studied the durability of the tags for eight days, a Namaqua Sandgrouse that was marked in the same fashion (number glued only onto one side of tag) at Rooipoort on 09.10.91 was seen at the same watering point on 04.06.92 and at a different watering point until 09.06.92. Burchell's Sandgrouse *Pterocles burchelli* marked with this technique were observed near the capture site in the Kalahari Gemsbok National Park two years after their release (T Jackson pers. comm.).

With the fall-net, Namaqua Sandgrouse were captured and released from the mistnet in a short time period to allow 75% (n = 65) of birds to be released with no visible negative side-effects. The patagial tag attachment technique greatly reduced the time needed to handle each bird. Moreover, the less time the sandgrouse were in hand, the less time the remainder of the birds were kept in the holding box, probably further reducing their capture stress. However, further research is needed to determine the maximum time a Namaqua Sandgrouse can be kept in a holding box before it passes a capture stress threshold. This time period may limit the number of birds that can be handled at any time as the 'processing period' is limited by the number of Swiftacher Tools and ringing pliers available. The number of field officers present at a capture also influences the processing speed. Although only 11 of 36 marked birds released were resighted, we believe that this capture and marking method at watering points for Namaqua Sandgrouse provided sufficient returns to justify its continued use.

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