# TRAPPING, RINGING AND COLOUR-MARKING MOULTING SPURWINGED GEESE AT STERKFONTEIN DAM, HARRISMITH

J.N. Geldenhuys and J.J. Blom

Although the Spurwinged Goose *Plectropterus gambensis* is a much sought-after bird among wildfowl hunters and is well-known for the damage it causes from time to time to crops, surprisingly little is known about its biology. On the highveld of the Transvaal and the Orange Free State their numbers are exceeded only by that of the Yellowbilled Duck *Anas undulata*, Redbilled Teal *Anas erythrorhyncha* and the Egyptian Goose *Alopochen aegyptiacus*. Yet relatively few nests and broods have been recorded locally, which is probably the reason why many farmers believe that Spurwinged Geese breed north of our limits. Although recoveries of Spurwinged Geese ringed at Barberspan suggest that this is not true (Milstein, P. le S. 1975. The biology of Barberspan with special reference to the avifauna. Ostrich Suppl. 10), moult aggregations on the eastern highveld may be derived from other areas.

Sterkfontein Dam (28 24S; 29 03E) is situated about 25 km south of Harrismith near the Drakensberg escarpment in the northeastern Orange Free State. The dam was selected for initial study because of the high numbers of Spurwinged Geese aggregating there for the annual wing moult in the winter time (Fig. 1 overleaf). The water of the dam is usually clear due to the fact that it is pumped from the Kilburn Dam beneath the escarpment. Since the first phase of the dam has been started (1976), the water level has risen gradually, never receding. The absence of exposed muddy shores and islands which characterise the unstable water levels of most other large dams did not, however, prevent Spurwinged Geese, Yellowbilled Ducks (up to 2 000), Egyptian Geese (up to 2 500) and Redknobbed Coots *Fulica cristata* (up to 13 700) from exploiting the new environment. Cultivated lands are not very common in this mountainous area with the result that serious damage occurs on the farms where crops are grown. Intensive goose hunting takes place on the surrounding farms where safari companies have obtained exclusive legal rights to provide hunting facilities for foreign visitors, a trade which has mushroomed in the past few years.

The main objective of the project is to find out where the geese go after they have completed their wing moult. In proposing management measures to protect and utilize the moulting populations, it is important to understand the rôle of this particular aggregation in the total Spurwinged Goose population of the subcontinent. Because of the opportunity provided by handling a large number of geese during the ringing operations, data are also collected for studying the effect of weight loss during

wing moult on the survival of the species, determining age and sex ratios and investigating morphological variations possibly associated with age and sex.

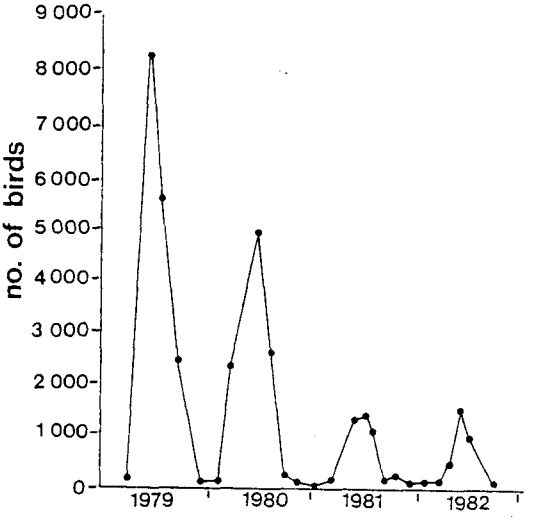


FIGURE 1

THE NUMBER OF SPURWINGED GEESE COUNTED ON STERKFONTEIN DAM, HARRISMITH

The traps, more correctly called capture kraals because roofs are absent, are constructed from metal poles, droppers, 1,2 m wide mesh and walk-in type funnels consisting of 6 mm thick ironrod frames covered with 50 mm square welded mesh (Fig. 2). The funnels are 0,6 m high and wide at the outer end and 0,3 m wide at the end projecting into the kraal. Initially the geese walk through the funnels entering the triangular capture kraal, where maize kernels and cobs are placed as bait. As soon as the birds discover they are enclosed they tend to run towards the waterside, thus entering the holding kraal through the second funnel. Although flightless geese cannot escape from the capture kraal, the small holding kraal ensures that those able to fly do not have room to get into the air.

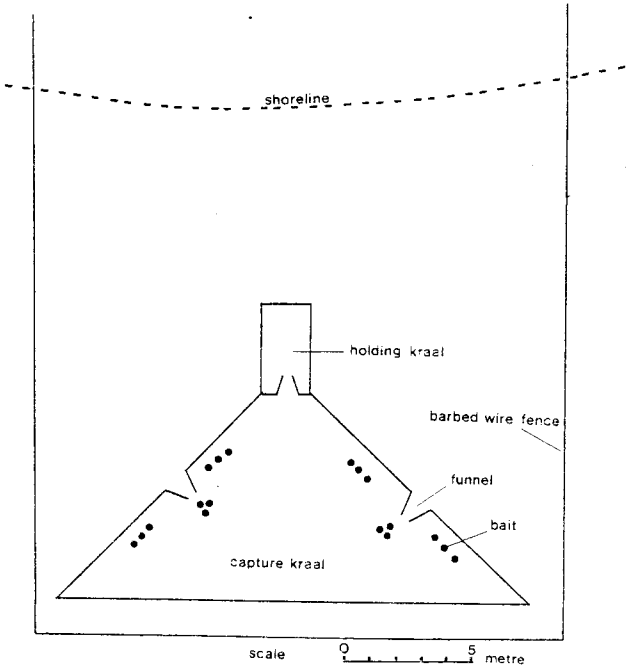


FIGURE 2

PLAN OF CAPTURE KRAAL FOR SPURWINGED GEESE. THE BARBED WIRE FENCE IS NECESSARY ONLY WHERE CATTLE CAN REACH THE CAPTURE SIGHT.

The capture kraals were placed 10 m away from the waterside in order to prevent large numbers of coot crowding the kraals and devouring the bait. During 1982 four kraals were positioned 100-200 m apart along the northwestern shore of the dam, where most geese congregated.

Standard 26 0 mm Monel G-rings were used and coloured PVC nasal saddles fitted to the geese. The saddles consisted of 15 mm-wide PVC strips bent in a U-shape over the upper mandible and fitted with 2,0 mm-thick nylon string (type widely used in electric lawn edge cutters) through the nasal cavities. The holes in the strip were punched 2 mm wide and the ends of the nylon string projecting sideways heated with the soldering iron or cigarette lighter (when the wind permitted) and pressed flat against the saddle. The nylon melts and congeals quickly to form a strong thickening free from sharp edges. Subsequent observation of marked birds in the field revealed, however, that the saddle was too small to be seen without binoculars. In the 1983 programme the use of neck collars, which are much more conspicuous, will be tested.

During 1982 trapping was undertaken from the first day of June until the end of August. The last week of May was used constructing the capture kraals and pre-baiting the capture sites. Of the 965 Spurwinged Geese captured (including retraps), 600 were ringed and colour-marked, which compared favourably with the relatively low numbers of that year (Fig. 1). It is planned to use a single colour for the marker per year. About 80% of the Spurwinged Geese were captured during June and the numbers declined rapidly thereafter. The probable reason was that the flightless period was passing and the birds able to fly either left the dam or found ample food on the freshly-harvested maize fields. About 85% of the geese were trapped overnight and ringed between 07h00 and 10h00. The capture sites were visited during the periods in the early morning and late afternoon when the geese were feeding on the maize fields or floating in rafts in the centre of the dam.

Up to date (31 December 1982), 11 recoveries of marked Spurwinged Geese were recorded, mainly from the central and eastern Orange Free State, but also from the Natal midlands and eastern Transvaal.

Other preliminary results are:

1 Male Spurwinged Geese loose, on average, 18,2% of their pre-moult weight during the flightless period and females 20,3%.

2 Males are, on average, 35,2% heavier than females in the pre-moult stage, and 40,0% heavier when the lowest weight is reached and the new feathers are about two-thirds of mature length (Table 1 overleaf).

3 Males constituted 45,7% of the birds trapped, which differs significantly from a 1:1 ratio ($Chi^2 = 3,98$: $P<0,05$). In the light of the general preponderance of females in the Tadornini (shelducks) and males in the Anatinae (perching, dabbling and diving ducks, where the Spurwinged Goose is usually placed), this sex ratio, if a true indication of the sex ratio in the population as a whole, raises interesting questions on the rôle of the sexes in pair formation and systematic affinities of the species.

4 Although the lengths of the culmen, tarsus, spur and body of the sexes differed significantly ($P<0,05$), overlaps occurred and the use of these parameters to distinguish between males and females in the field would not be reliable (Table 2 on page 23). Generally the males are larger than the females and the experienced observer would be able to point out the smaller females and larger males, classifying about 10% of the females incorrectly as males because of their relatively large size.

5 There is a great degree of variation in the presence and extent of bare skin patches at the base of the culmen, around the eyes and on the neck. Generally bare skin patches were more common in the males, but occurred in both sexes with birds of both sexes present with no bare patches. Of the males, 46,4% had prominent knobs on the forehead, 19,3% had a noticeable swelling and 34,3% had no swellings. No females had prominent knobs, although 11,8% had various degrees of swollen areas on the forehead. Although large knobs appear to occur among males only, the absence thereof is not a reliable female characteristic. Like the bare patches of skin on the head and neck, the presence of knobs on the forehead may be related to age rather than sex. This should be tested with birds raised in captivity.

Although the sexes of moulting Spurwinged Geese could easily be determined by cloacal examination exposing the penis if present with the fingers (see Skead, D.M. 1973. Cloacal examination of Anatidae. Safring News 2: 14-17), exposing or measuring the bursa of Fabricius and locating the oviduct opening were time-consuming and not possible in many birds due to the strong vent muscles. The use of a medical instrument to expose the cloaca will be investigated in 1983.

TABLE 1

WEIGHT (g) OF SPURWINGED GEESE DURING DIFFERENT STAGES OF WING MOULT

0 = Old remiges still in position
1 = Some or all of the remiges dropped, but new ones not visible
2 = New remiges present as blood quills only
3 = New remiges about one-third of mature length
4 = New remiges aout two-thirds of mature length
5 = New remiges fully developed

| Moult Stage | N | $\bar{X}$ | SD | MIN. | MAX. |
|---|---|---|---|---|---|
| Males | | | | | |
| 0 | 45 | 5 358 | 753 | 4 300 | 7 300 |
| 1 | 49 | 5 296 | 729 | 3 600 | 6 300 |
| 2 | 50 | 5 184 | 658 | 3 300 | 6 900 |
| 3 | 60 | 4 685 | 537 | 3 500 | 6 000 |
| 4 | 39 | 4 449 | 454 | 3 700 | 5 100 |
| 5 | 6 | 4 385 | 366 | 3 800 | 5 000 |
| Females | | | | | |
| 0 | 26 | 3 962 | 812 | 3 000 | 6 100 |
| 1 | 60 | 3 770 | 479 | 2 700 | 5 000 |
| 2 | 84 | 3 660 | 675 | 2 500 | 5 400 |
| 3 | 64 | 3 300 | 584 | 2 200 | 5 100 |
| 4 | 44 | 3 159 | 670 | 2 400 | 5 400 |
| 5 | 2 | 3 600 | 849 | 3 000 | 4 200 |

TABLE 2

MEASUREMENTS OF MALE AND FEMALE SPUR-WINGED GEESE UNDERGOING WING MOULT.

| Parameter | n | $\bar{x}$ | SD | CV% | Min. | Max. |
|---|---|---|---|---|---|---|
| Culmen length (mm) | | | | | | |
| Males | 257 | 80,4 | 4,3 | 5,3 | 70,0 | 97,0 |
| Females | 295 | 73,2 | 4,5 | 6,1 | 61,0 | 91,0 |
| Tarsus length (mm) | | | | | | |
| Males | 251 | 117,8 | 6,3 | 5,3 | 95,0 | 138,0 |
| Females | 290 | 99,8 | 8,7 | 8,7 | 82,0 | 128,0 |
| Spur length (mm)+ | | | | | | |
| Males | 224 | 17,5 | 3,3 | 18,9 | 9,0 | 29,0 |
| Females | 245 | 13,8 | 3,0 | 21,7 | 7,0 | 24,0 |
| Total length (cm)++ | | | | | | |
| Males | 221 | 98,0 | 4,6 | 4,7 | 79,0 | 109,0 |
| Females | 259 | 85,5 | 5,9 | 6,9 | 74,0 | 104,0 |

\+ old spur sheath

++ culmen tip to tail tip

The study is planned for five years, during which adequate numbers of geese should be ringed and marked to enable us to clear up some of the uncertainty surrounding the movements of the species.

J.N. Geldenhuys and J.J. Blom, Orange Free State Division of Nature Conservation, P.O.Box 517, BLOEMFONTEIN, 9300