The two presumed females flew at about 2 500-2 700 g 35 days apart and the males at 3 700-3 900 g 23 days apart, but basically they flew in the same order as they had started feather development, although 'A' flew slightly before 'E' and 'C'.

None was weighed after 8 September as they were all flying and becoming difficult to catch. Unfortunately they were too trusting and two were murdered when they went too close to some fishermen; the culprits brought the coloured rings back. The other three may still survive although none has been seen since 2 January 1982, but in her last appearances 'A' returned several times with a wild mate. From experience with others of this species and with Whitefaced Ducks *Dendrocygna viduata*, hand-reared birds seldom return home after becoming integrated with wild flocks on the river.

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MARKING AND OBSERVING HELMETED GUINEAFOWL IN THE KRUGERSDORP GAME RESERVE

J.H. van Niekerk

The trapping of Helmeted Guineafowl *Numida meleagris* in the Krugersdorp Game Reserve has been described in some detail in Safring News Vol 11(2) 1982. This paper describes the marking and related aspects of guineafowl study in the Reserve.

Marking Material (Fig. 1 opposite)

From a total of 110 guineafowl trapped during the period April 1982-July 1983, 53 were fitted with small plastic triangular numbered patagial tags and tarsal rings (both metal and coloured plastic rings). Some guineafowl were given two patagial tags to allow easier field identification.

Handling of Guineafowl

Marking consisted of fitting a metal ring to one leg, two plastic colour rings to the other leg and two patagial tags. Initially it took 20 minutes for an inexperienced marker with one helper to mark one guineafowl. With experience, however, (after having marked, say, 20 guineafowl), it could take as little as six minutes to mark one bird.

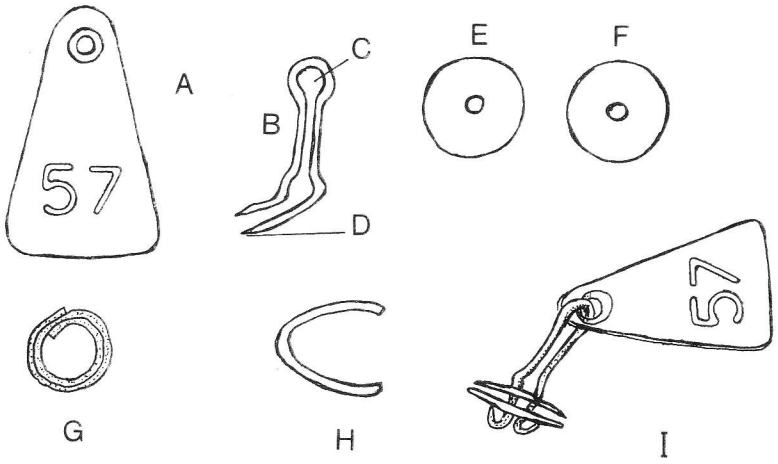


FIGURE 1

A :	PATAGIAL TAG	B :	PATAGIAL PIN
C :	SPLIT PIN LOOP	D :	SHARPENED AND SIDE-WAYS BENT TIPS
E & F :	UPPER AND LOWER PIN STABLIZERS	G :	PLASTIC RING
H :	METAL LEGEND RING	I :	COMPLETED TAG

The following procedures proved to be effective: after the guineafowl had entered the trap, they were caught one at a time with the aid of a hand-held net. (Attempts to catch them by their tails should be avoided). Once caught, their heads were covered with dark, non-transparent caps as blindfolding reduces panic. One guineafowl was taken, turned upside down and clamped between the marker's thighs. (The marker should be wary of a kick in the eye). After the tarsal rings had been properly attached, the legs were firmly bound together with masking tape. To fit the patagial tag, the chosen wing was opened (pulled away from the body) and 3-4 cm. of marginal upper wing-coverts were plucked. A small hole was pierced through the patagial membrane with a curved sack needle, avoiding all membraneous blood vessels. The tag was fitted firmly but not too tightly. The tips of the split pin (which will be below the wing) were bent over sideways with long-nosed pliers while the upper end of the pin was held firmly in the other hand. The tag was straightened to hang in the most natural way and the guineafowl was released after the cap and masking tape had been removed.

All retrapped guineafowl showed significant friction marks on the leg scales caused by rings that moved up and down with the movement of the guineafowl and six months after ringing the legs were smooth and virtually scaleless. Metal rings caused the most friction. The metal part of the patagial tag caused a slight flesh bruise directly around it on the membrane and this was subsequently evident for a few months. Moving tags caused impact marks on the membrane.

Endurance of Marking Material

Most marking material remained functional for at least 15 months. From a total of 50 tags used, 22% became useless. Four of these were split in half, 5 became detached from the tag pins and three faded. The faded tags were all pink. Red, blue and green tags were the other colours used. No damage to the metal or colour rings was observed.

Behaviour

Marked guineafowl did not react unnaturally towards each other or to the tags. Predators did not appear to select or catch marked birds more easily than unmarked ones. Broken or lost tags were mostly in evidence on those guineafowl identified as the guardians of the flocks as they did more flying and running. Tags appeared to hamper the flight of young guineafowl below the age of 15 weeks. Throwing these marked juveniles up into the air on release helped them to overcome the handicap.

Visibility

Helmeted Guineafowl are by nature very nervous and active (e.g. perching, scratching and chasing), especially in the mornings and late afternoons. As a result, it often takes 10-15 minutes to read a numbered tag. One can conduct observation in the non-active periods but most guineafowl seek cover (shade) at such times. Other major factors affecting good observation are: direct sunlight (relatively dim light proved to be best); distance (30-40 m proved best, provided powerful binoculars or telescopes were used); behaviour (e.g. during preening the tag is mostly tucked beneath the plumage); season (guineafowl are more cryptic during the breeding season because of smaller group sizes), and vegetational characteristics of a territory (guineafowl are difficult to observe in tall grass).

Casque and Bare Skin Markings

Adult guineafowl exhibit interesting individual differences in the bony casque and bare skin parts of the face and neck.

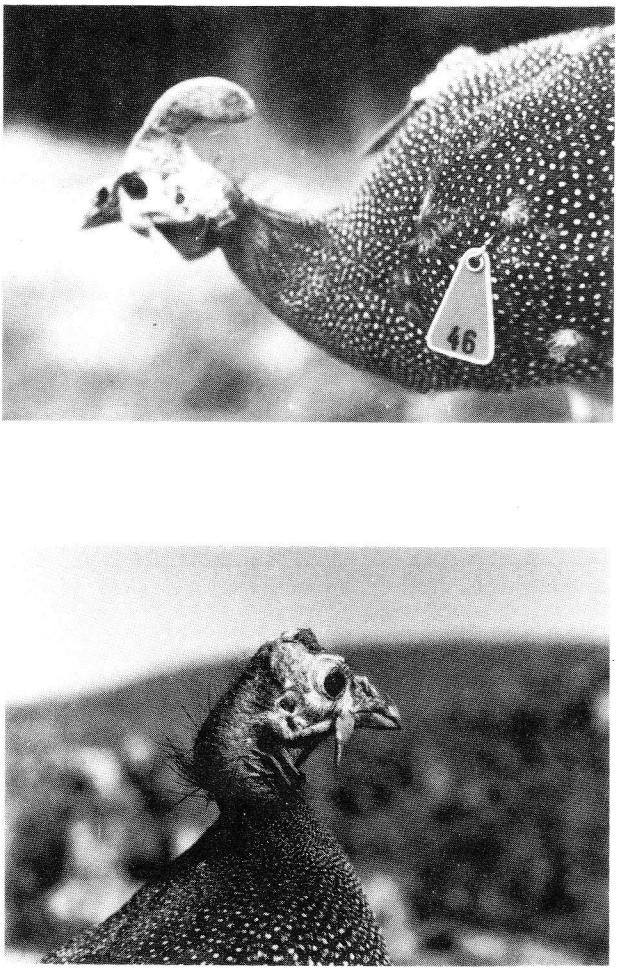
Casque Differences:

A social group (flock) of guineafowl in the Reserve seldom exceeds 15 members (more likely 8-10). Among these guineafowl at least three types of casques (from a potential of seven) can be recorded. The two photographs shown overleaf illustrate the extremes of casque development.

Bare Skin Colour Patterns

At least four colour patterns were observed: a 'dirty pattern' (an irregular combination of cobalt-blue and light-blue blotches), a 'clean pattern' (with the skin almost completely light-blue), a 'striped pattern' (horizontal cobalt-blue or black stripes on the neck skin) and finally, a 'banded pattern' with a broad black band which runs vertically down the neck.

Retrapped guineafowl, which had initally been trapped and colour-photographed several months before, showed no significant change in bare skin colour patterns. Sex, age and different seasons do not appear to effect these colours although in many cases black markings wore down to a cobalt-blue.



Guineafowl showing differential casque development. Top bird shows normal carrying position of patagial tag. (J. van Niekerk)

Guineafowl spend much time feeding in tall grass. Characteristics of the head and neck (which at such times are the only visible parts of the bird) offer individual identification criteria for the observer.

Combining and recording casque shapes and bare skin colour patterns of individual birds has proved to be an authentic identification technique in a small group of guineafowl.

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FURTHER COMMENT ON BILL PIGMENTATION IN THE WOODLAND KINGFISHER

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The paper by Hanmer (1983) on aberrant bill pigmentation in the Woodland Kingfisher *Halcyon senegalensis*, with additional comments both by Fry (1983) and Mrs Hanmer, was most interesting to me as I had also noted aberrant bill pigmentation in this fascinating kingfisher at Mineral Range 190 JS in the central Transvaal (25 20S; 29 35E).

It is important to realise that in this kingfisher the bill is initially pink, but subsequently dusky melanistic pigment is deposited in both mandibles before later attainment of the characteristic adult colouration of scarlet maxilla and black mandible under genetic control. In an earlier paper on the breeding biology of this species (Milstein 1962), I noted:

> "The beak, gape, and legs are still salmon pink up to about seven days of age. Then dark pigments begin to develop in both mandible and maxilla, while the pink colour gradually becomes orange. Apparently normal development is a gradual darkening of the bill until it is a dark brownish or blackish colour, with the tips of both mandible and maxilla still orange, and the gape orange or red-orange. Data from J.P. Chapin (1961, personal communication), Barbour and Tarboton