FARMING IT OUT

The decline of Helmeted Guineafowl in KwaZulu-Natal

Text by Tim Crowe & Charles Ratcliffe

The Helmeted Guineafowl *Numida meleagris* has come to epitomise rural and wild African landscapes. Its raucous cackle, bold behaviour and 'spotted fowl' appearance give it an enduring character that has captured the imaginations of clothing designers and makers of curios throughout southern Africa. Indeed, tourists could be forgiven for thinking it was the country's national bird!

Over the past 150 years, the Helmeted Guineafowl has undergone a massive range expansion – partly through deliberate introductions and partly through its ability to adapt to agricultural land. It has even expanded into the Karoo by using telephone poles for its nightly roosts. The Midlands of KwaZulu-Natal has been no exception in the species' expansion drive and, for the first three-quarters of the 20th century, the area became well known for the large bags of guineafowl taken during wingshoots (gamebird hunts). But, sadly, such bags have slipped into the realm of legend.

During the early 1980s, farmers, wingshooters (gamebird hunters) and conservationists from the Midlands began to complain of marked declines in guineafowl populations across a broad geographical front. Our initial reaction to these complaints was one of disbelief. How can a bird that can live for more than five years and produce 15 to 20 chicks a year be in a population decline? Our advice was that populations were low because of poor rainfall (thus affecting watering points, nesting cover and plant and insect food), and that they would recover after years of good rainfall as they appear to do in other areas of South Africa. When this did not happen in the Midlands, a team of

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Right *The Underberg region – a desolate scene for a species such as the Helmeted Guineafowl, which thrives in 'edge' habitats.*

Opposite *The Helmeted Guineafowl – a dwindling species in the southern parts of KwaZulu-Natal.*

ALBERT FRONEMAN

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Crop spraying of maize. Agrochemicals were initially a highly fashionable 'culprit' in the guineafowl's demise. Their indirect effects in reducing food and cover proved more serious.

A recently ploughed maize field. Note that even the contours are ploughed (known as broad-based drains) which further reduces suitable 'edge' habitat.

gamebird biologists led by Professor Tim Crowe of the Percy FitzPatrick Institute at the University of Cape Town embarked on a reconnaissance trip to assess the status of local guineafowl populations. To their amazement, they confirmed widespread collapses of guineafowl populations and, in some areas, local extinctions.

In 1995, the KwaZulu-Natal branch of the African Gamebird Research, Education and Development Trust (AGRED) commissioned a team of researchers from the Gamebird Research Programme of the Percy FitzPatrick Institute to undertake a major research project on Helmeted Guineafowl populations. The project addressed two key questions, namely, what had caused the declines, and what possible remedies could be employed to resuscitate collapsed guineafowl populations in order to ensure that they remained at viable levels that could withstand sustained wingshooting.

The project took four years to complete and investigated several potential causes of the collapse, including disease, poisoning with pesticides, habitat destruction, and genetic 'pollution' resulting from the interbreeding with released domesticated guineafowl, which survive very poorly in the wild. In order to determine the habitat preferences of guineafowl, project team members even fitted birds with radio transmitters and tracked their movements.

In an article in the August 1999 issue of *Sawubona* magazine, it was incorrectly reported that poisoning by pesticides was in fact the cause of population crashes. This could be attributed to a mis-reading of one of our team's early scientific publications that found that the most serious population declines were on farms where pesticides were used heavily. Poisoning is a much publicised culprit in the demise of various other bird species – and with good reason – yet it appears that for guineafowl in the Midlands it is a localised phenomenon. Since 1985 the Allerton Provincial Veterinary Laboratory in Pietermaritzburg has recorded only 42 such cases involving 145 birds: roughly only three to four flocks over 13 years. In addition, liver samples from guineafowl collected from a range of sites throughout the Midlands and analysed by the Forensic Chemistry Laboratory in Cape Town revealed only infinitesimally low, residual traces of pesticides.

It was the radio-tracking that helped us to identify the 'real' culprits behind the collapse: habitat fragmentation and destruction as a result of massive increases in crop agriculture from the 1970s through to the late 1980s. Maize – the dominant commercial crop in the study area – doubled in production between the late 1970s and early 1980s. Other crops, such as wheat and soya, also increased significantly during the same period. Thus the correlation between crashing guineafowl populations and the use of pesticides merely reflects this increase in crop agriculture and reduction (as a result of pesticides) in food and cover. It does not imply the deliberate or unintentional misuse of these agrochemicals.

Genetic pollution may, like disease, poisoning and poaching, have localised negative effects on guineafowl populations, but geneticist colleagues have yet to uncover major evidence of tell-tale DNA sequences from domesticated guineafowl being found in wild populations.

Further results from the project have also dispelled some of the other suspected 'culprits', such as disease. Of the 12 diseases tested for, only two have the potential to decimate a species at a population level: avian influenza and Newcastle disease. Tests for both of these diseases proved negative.

In addition, radio-tracking revealed the importance of small maize fields surrounded by weedy edge habitat in supporting healthy populations. Apart from demonstrating the birds' preference for edge habitat, this work revealed an increase in home range size as one moved from large, stable populations ▷

Above *Ideal guineafowl habitat – a matrix of land uses, including fallow lands and small maize fields.*

Left *Domesticated guineafowl are characteristically poor incubators and parents; introduced birds thus have the potential to reduce the viability of wild populations.*

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Radio-tracking the birds allows researchers to determine home ranges and habitat utilisation of populations within the Midlands.

to those near extinction. In other words, declining populations under stress need to have larger home ranges because of fragmentation of critical components of their habitat. Preferred habitat is fallow lands with small maize fields. It was not only the nature of the habitat types themselves that distinguished between healthy and declining populations, but more the availability of a variety of habitats and resources over a continuous area. The greater the habitat mosaic over a large area, the healthier the populations prove to be.

The project's findings suggest that the increases in crop agriculture dating back to the 1970s – primarily of maize – led to a loss of suitable habitat and the fragmentation of guineafowl populations throughout the Midlands. In addition, the indirect effects of pesticides worsened the situation by reducing the availability of food resources (for example, seeds and roots from weeds and insects) and edge habitats.

Once populations have become fragmented, they can be extremely vulnerable to local extinction. In the event of large, localised mortality (as a result of disease, poisoning or poaching, for example) they cannot recruit immigrants from neighbouring populations. The conservation 'bottom line' is that a system of healthy guineafowl populations (known as a meta-population in scientific terms) can withstand considerable mortality from a range of causes and still support wingshooting activity. In effect, it takes care of itself and requires essentially no costly management. It is only when the population becomes isolated and drops below its minimum viable level that it becomes prone to collapse.

So the ultimate cause of the collapse in guineafowl populations is habitat fragmentation and destruction, even though the final blow might come from disease, poisons, poaching, etc. In a way, a declining guineafowl population is like a patient with AIDS: the patient doesn't die from AIDS, but from cancer, pneumonia, or some other disease that invades a weakened, defenceless body. However, the real cause of death is a failure of the immune system, which, in the case of guineafowl, is healthy continuous habitat.

Resuscitating guineafowl populations to viable levels requires re-creating their preferred habitat, namely weedy, fallow lands with adjacent open spaces. And all this requires is for farmers to do nothing! Indeed, one conservation-oriented farmer has already done just this. In less than two seasons his guineafowl population, which was decimated through deliberate poisoning, has recovered from fewer than 100 birds to several hundred because he left patches of his less profitable land to lie fallow. However, if neighbouring farmers don't do the same thing and re-create the meta-population structure that existed until the 1970s, sooner or later his isolated guineafowl population could collapse again. Thus the key to the conservation of this fascinating gamebird and, indeed, of Africa's biodiversity as a whole, is maintaining the connections between populations that allow them to rescue one another from extinction. □

Study area of Helmeted Guineafowl populations in the Midlands of KwaZulu-Natal. The population status is indicated for four of the main districts in the study area.