National Quail Symposium Proceedings

Volume 6 Article 2

2009

Management of Southern African Gamebirds: Opportunities and Threats

Tim Crowe
University of Cape Town

Management of Southern African Gamebirds: Opportunities and Threats

Tim Crowe[1]

Gamebird Research Programme, Percy FitzPatrick Institute, University of Cape Town, Private Bag, Rondebosch 7701 South Africa

Three evolutionarily quite distinct groups of galliforms contribute to a healthy wingshooting industry in southern Africa: guineafowl (*Numida* spp.), francolins (*Scleroptila* spp.) and spurfowls (*Pternistis* spp.). Some species, such as the helmeted guineafowl (*N. meleagris*), Swainson's spurfowl (*P. swainsonii*) and greywing francolin (*S. africanus*), thrive in moderate to heavily disturbed landscapes, mainly agriculture. In fact, helmeted guineafowl and Swainson's spurfowl increased both in abundance and range during the 20th century. Others, such as the redwing (*S. levaillantii*) and Orange River francolins (*S. levaillantoides*) are very sensitive to certain types of land use. These strikingly different responses to land use require equally diverse strategies in order to develop truly sustainable management strategies and policies. These are discussed in detail for each of these five species of gamebirds.

Citation: Crowe T. 2009. Management of southern african gamebirds: opportunities and threats. Pages 11 - 15 in Cederbaum SB, Faircloth BC, Terhune TM, Thompson JJ, Carroll JP, eds. Gamebird 2006: Quail VI and Perdix XII. 31 May - 4 June 2006. Warnell School of Forestry and Natural Resources, Athens, GA, USA.

Key words: management, southern African gamebirds, threat, utilization

Introduction

Three phylogenetically distinct groups of galliforms contribute to a healthy shooting industry in southern Africa: guineafowl (*Numididae*), francolins (*Scleroptila* spp.) and spurfowls (*Pternistis* spp.). Some species, e.g. greywing francolin (*S. africanus*), helmeted guineafowl (*Numida meleagris*), Swainson's and cape spurfowl (*P. swainsonii* and *capensis*) thrive in moderately to heavily human-modified landscapes. Helmeted guineafowl and Swainson's spurfowl actually increased both in numbers and range during the first two thirds of the 20th century. Others, e.g. redwing (*S. levaillantii*) and Orange River francolins (*S. levaillantoides*), are very sensitive to certain types of land use. These strikingly different responses to land use require the application of equally diverse management strategies to maintain populations for hunting. These are discussed in brief for each of these five gamebirds.

Here I summarize key points emanating from the results of more than 50 person-years of research on southern African gamebirds by myself and my students: Rob Little (greywing francolin and cape spurfowl), Ray Jansen (redwing francolin and Swainson's spurfowl), and Lionel Pero, Luthando Maphasa, Gerard Malan, Charles Ratcliffe, Helen Prinsloo and Ian little (helmeted guineafowl). Much of what I write below is summarized in Little and Crowe (2000) and discussed in detail in the papers listed in the bibliography.

Helmeted Guineafowl

The helmeted guineafowl may use the frequency of heavy rainfall as a cue to initiate breeding, given that year-to-year variation in their populations (and bags) are positively correlated with monthly frequency of rainfall (Crowe and Siegfried 1978). The availability of arthropod food (critical for successful breeding) is also strongly correlated with rainfall. However, population increases were lower following successive years with high rainfall, perhaps suggesting that the population is limited in a density-dependent manner (Crowe 1978).

Starting in the mid-1980s there were reports of wide-scale collapses of guineafowl populations outside of protected areas. I originally attributed these

[1]**Correspondence**: Timothy.Crowe@uct.ac.za

to several successive years with lower than normal rainfall (Crowe and Siegfried 1978), but I was wrong.

Subsequent research showed that the number of pesticides used, individual pesticide toxicity levels and percentage of land under cultivation are negatively correlated with guineafowl populations. However, Swainson's spurfowl populations are positively correlated with these same factors (Pero and Crowe 1996). The fundamental cause of guineafowl population declines and collapses in agricultural landscapes was population fragmentation leading to the undermining of meta-population structure (Ratcliffe and Crowe 2001*a*). In other words, when local fragmented subpopulations came under threat (for whatever reason) they could not be resuscitated by immigration from adjacent subpopulations.

Guineafowl in human-transformed landscapes do not have a home range as traditionally understood. Their daily and seasonal movements are determined by the dispersion of habitat focal points: roosts, drinking water, and habitat for feeding, dusting, and cover (Prinsloo 2003). Indeed, at a revegetated coal mine where all focal habitat components were closely clustered, guineafowl flocks hardly moved during the day (Little et al. 2005). In agricultural areas they also prefer a mosaic of habitats especially with large amounts of edge in proportion to area (Ratcliffe and Crowe 2001*a*,*b*,*c*). So, the critical management strategy for the management of guineafowl as a game quarry species is to cluster habitat focal points and thus maintain multiple local subpopulations in restricted areas.

Orange River Francolin

Unlike that of helmeted guineafowl, the Orange River francolin population in an arid grassland within a protected area collapsed to virtually nil after a five-year bout of overgrazing during the 1930s (Berry and Crowe 1985). This still very poorly studied francolin is one of the most sensitive birds to the grazing and burning of its habitat. Only pristine (rarely burned and ungrazed) arid grasslands can support shootable populations and then at very low levels (Berry and Crowe 1985).

Redwing Francolin

A habitat gradient analysis showed that the abundance of the redwing francolin and other grassland birds in highland wet grasslands is negatively correlated with both grazing pressure and the frequency of burning (Jansen et al. 1999, 2000, 2001*a*,*b*). Once again, as with Orange River francolin, it is absolutely essential to minimize the negative effects of grazing and burning (i.e., removal of cover and damage to leguminous food plants) on redwing habitat if a shootable surplus is to be provided.

Greywing Francolin

Unlike the previous two francolins, the greywing francolin thrives under moderate sheep grazing (Little and Crowe 2000) and can even withstand as much as a 50% annual shooting offtake (Little and Crowe 1993*a*,*b*,*c*). For this reason, this francolin is considered as one of southern Africa's champagne gamebirds, earning shoot operators as much as five times the fees paid for other local gamebirds.

Cape Spurfowl

Like the helmeted guineafowl, the cape spurfowl thrives in golf courses with large amounts of edge habitat and the rough dominated by alien trees and brush (Little and Crowe 1994). This spurfowl certainly benefits from habitat transformation by humans through its ability to colonize alien vegetation and suburban parklands. However in agricultural land it requires patches of fragmented, but closely situated, natural (mainly Mediterranean) vegetation for successful roosting and nesting. For these reasons, I believe it is currently underexploited as a gamebird.

Swainson's Spurfowl

Unlike all other gamebirds discussed above, this species has, in most instances, benefited enormously from agriculture; primarily due to the increased food availability found in growing crops, especially maize (Jansen and Crowe 2002). However, Swainson's spurfowl populations have shown declines if its preferred breeding habitat (islands of brush and

trees) is eliminated (Jansen and Crowe 2002). Because of its general prevailence, Swainson's spurfowl is often the focus of what are locally known as community shoots. Some of these community shoots involve 100 or more hunters and may ultimately threaten local populations because of the massive, short term (i.e. over a weekend) offtakes (Jansen, unpublublished data).

Summary

Each southern African gamebird discussed above has its own management 'signature' and thus gamebird management is situation dependent, e.g. in protected areas vs human-transformed landscapes. Moreover, like the much more intensively studied grey partridge *Perdix perdix* (Potts 1986), before we can provide an ironclad management strategy for any of these species, situation-specific research is still a necessity.

Acknowledgments

The research underpinning the results discussed above and outlined in detail in the readings listed in the Bibliography were funded by the African Gamebird Research, Education and Development Trust, the South African National Research Foundation, the Percy FitzPatrick Institute of African Ornithology and the University of Cape Town's University Research Committee. I thank all my former students for their collaboration and John Carroll and his family for support and accommodation.

Bibliography

Berry, M., and T. Crowe. 1985. Effects of monthly and annual rainfall on game bird populations in the Northern Cape Province, South Africa. South African Journal of Wildlife Research 15:69–76.

Crowe, T. 1978. Limitation of population in the helmeted guineafowl. South African Journal of Wildlife Research 8:117–126.

Crowe, T., and W. Siegfried. 1978. It's raining guineafowl in the Northern Cape. South African Journal of Science 74:261–262.

Crowe, T. M. 1984. Diet of helmeted guineafowl in a semi-arid environment. South African Journal of Science 80:188.

Crowe, T. M., and S. B. Elbin. 1987. Social behaviour of helmeted guineafowl (*Numida meleagris*). South African Journal of Wildlife Research Supplement 1:55–57.

Crowe, T. M., and R. M. Little. 2004. Francolins, partridges and spurfowls: What's in a name? Ostrich 75:199–203.

Elbin, S. B., T. M. Crowe, and H. B. Graves. 1986. Reproductive behaviour of helmeted guinea fowl (*Numida meleagris*): Mating system and parental care. Applied Animal Behavioral Science 16:179–197.

Jansen, R., and T. Crowe. 2002. Population fluctuations in relation to seasonal habitat preferences of the Swainson's spurfowl, *Pternistis swainsonii*. African Journal of Ecology 40:309–317.

Jansen, R., and T. M. Crowe. 2005. Relationship between breeding activity and rainfall for Swainson's spurfowl, *Pternistis swainsonii*, within southern Africa, with specific reference to the Springbok Flats, Limpopo Province, South Africa. Ostrich 74:190–194.

Jansen, R., S. D. V. der Spuy, and T. Crowe. 2006. Low incidence of blood parasite infection within a population of Swainson's spurfowl *Pternistis swainsonii*. Ostrich 77:109–111.

Jansen, R., R. Little, and T. Crowe. 1999. Implications of grazing and burning of grasslands on the sustainable use of francolins (*Francolinus* Spp.) and on overall bird conservation in the highlands of Mpumalanga Province, South Africa. Biodiversity and Conservation 8:587–602.

Jansen, R., R. Little, and T. Crowe. 2000. Habitat utilization and home range of the redwing francolin, *Francolinus levaillantii*, in highland grasslands, Mpumalanga Province, South Africa. African Journal of Ecology 38:329–338.

Jansen, R., R. Little, and T. Crowe. 2001*a*. Breeding biology of the redwing francolin in the highland grasslands of Mpumalanga Province, South Africa. Ostrich 72:20–23.

Jansen, R., E. Robinson, R. Little, and T. Crowe. 2001*b*. Habitat constraints limit the distribution and population density of redwing francolin, *Francolinus levaillantii*, in the highland grasslands of Mpumalanga Province, South Africa. African Journal of Ecology 39:146–155.

Jansen, R. R. A. E., R. M. Little, and T. M. Crowe. 1998. Haematozoa of redwing and greywing

francolin from three montane grassland habitats in Mpumalanga Province, South Africa. South African Journal of Wildlife Research 28:4–7.

Little, I., R. Little, R. Jansen, and T. Crowe. 2005. Winter bird assemblages, species richness and relative abundance at a re-vegetated coal mine in the Middelburg District, Mpumalanga Province, South Africa. South African journal of Wildlife Research 35:13–22.

Little, R., and T. Crowe. 1992*a*. The use of morphometrics and development of plumage in estimating the growth patterns and age of greywing francolin *Francolinus africanus*. Ostrich 63:172–179.

Little, R., and T. Crowe. 1992*b*. Vocal behaviour of greywing francolin *Francolinus africanus* can be used to estimate population density. Ostrich 63:98–109.

Little, R., and T. Crowe. 1993*a*. The breeding biology of the greywing francolin *Francolinus africanus* and its implications for hunting and management. South African Journal of Zoology 28:6–12.

Little, R., and T. Crowe. 1993*b*. Hunting efficiency and the impact of hunting on greywing francolin populations. South African Journal of Wildlife Research 23:31–35.

Little, R., and T. Crowe. 1993*c*. A population biology and genetic approach to sustainable hunting of greywing francolin *Francolinus africanus*. Page 268 *in* Proceedings of the 8th Pan-African Ornithological Congress, volume 76.

Little, R., and T. Crowe. 1994. Conservation implications of deciduous fruit farming on birds in the Elgin District, Western Cape Province, South Africa. Transactions of the Royal Society of South Africa 49:185–197.

Little, R., and T. Crowe. 1998. Habitat Fragmentation limits the distribution of cape francolin, *Francolinus capensis*, on deciduous fruit farms in South Africa. African Journal of Ecology 36:140–147.

Little, R., and T. Crowe. 2000. Gamebirds of southern Africa. Struik, Cape Town, ZA.

Little, R., and T. Crowe. 2004. Effects of a predator control experiment on grey-winged francolin (*Scleroptila africanus*) populations. Ostrich 75:285–287.

Little, R., T. Crowe, and S. K. C. Peall. 1997. Pesticide residues in helmeted guineafowl *Numida meleagris* livers collected in deciduous fruit farms in the Western Cape Province, South Africa. South African Journal of Wildlife Research 27:1–4.

Little, R., R. A. Earle, and T. Crowe. 1993*a*. Mortality caused by histomoniasis in young greywing francolin. South African Journal of Wildlife Research 23:53–58.

Little, R., R. M. Gous, and T. Crowe. 1993*b*. The distribution and abundance of greywing francolin, *Francolinus africanus*, on the Stormberg Plateau, Eastern Cape Province, South Africa, in relation to diet and substrata. Ostrich 64:105–114.

Little, R., W. S. Grant, and T. Crowe. 1992. Conservation and population genetics of the greywing francolin *Francolinus africanus*. Pages 882–883 *in* M. Birkan, G. Potts, N. Aebischer, and S. Dowell, editors. Perdix VI, First International Symposium on Partridge, Quails and Francolins, volume 23.

Little, R., W. S. Grant, and T. Crowe. 1993*c*. Does hunting affect the demography and genetic structure of greywing francolin *Francolinus africanus*? Biodiversity & Conservation 2:567–585.

Little, R., W. S. Grant, and T. Crowe. 1993*d*. A population biology and genetic approach to sustainable hunting of the greywing francolin *Francolinus africanus*. Proceedings of the 8th Pan-African Ornithological Congress 76.

Little, R., W. S. Grant, and T. Crowe. 1993*e*. Seasonal and demographical variation in intestinal helminth infection of greywing francolin. Ostrich 64:178–181.

Little, R., J. S. A. Perrings, T. M. Crowe, and A. Witt. 1995. Notes on the diet of helmeted guineafowl *Numida meleagris* on deciduous fruit farms in the Western Cape Province, South Africa. South African Journal of Wildlife Research 25:144–146.

Pero, L., and T. Crowe. 1996. Helmeted guineafowl *Numida meleagris* in KwaZulu-Natal: A case for non-sustainability. South African Journal of Wildlife Research 26:123–140.

Potts, G. R. 1986. The partridge: Pesticides, predation and conservation. Collins, London, UK.

Prinsloo, H. 2003. Use of landscape and sustainable utilization of helmeted guineafowl in the Riemland of the Free State, South Africa. Master's thesis, Pretoria Technikon, Pretoria, ZA.

Prinsloo, H. C., V. Harley, B. K. Reilly, and T. M. Crowe. 2005. Sex-related variation in morphology of helmeted guineafowl (*Numida meleagris*) from the Riemland of the Northeastern Free State, South Africa. South African Journal of Wildlife Research 35:95–96.

Ratcliffe, C., and T. Crowe. 2001*a*. Declining populations of helmeted guineafowl in the midlands of KwaZulu-Natal, South Africa: A review of causes and remedies. South African Journal of Wildlife Research 31:161–171.

Ratcliffe, C., and T. Crowe. 2001*b*. The effects of agriculture and the availability of edge habitat of populations of helmeted guineafowl *Numida meleagris* and on associated bird assemblages in KwaZulu-Natal Province, South Africa. Biodiversity and Conservation 10:2109–2127.

Ratcliffe, C., and T. Crowe. 2001*c*. Habitat utilisation and home range of helmeted guineafowl, *Numida Meleagris* in the midlands of KwaZulu-Natal Province, South Africa. Biological Conservation 98:333–345.

Ratcliffe, C., T. Crowe, and S. K. C. Peall. 2000. Pesticide residues in helmeted guineafowl livers from crop farms in the midlands of KwaZulu-Natal Province, South Africa. South African Journal of Wildlife Research 30:145–150.

Ratcliffe, C., R. M. Gous, H. K. Swatson, and T. Crowe. 2002. The digestibility of raw and processed soybeans by helmeted guineafowl, *Numida meleagris*. Ostrich 73:135–137.

Walker, A. L., R. C. K. Bowie, C. S. Ratcliffe, and T. M. Crowe. 2004. Fowl play: Identification and management of hybridisation between wild and domestic helmeted guineafowl (*Numida Meleagris*) in South Africa. Ostrich 75:195–198.

Witt, A. B. R., R. M. Little, and T. M. Crowe. 1995. The effectiveness of helmeted guineafowl *Numida meleagris* (Linnaeus 1766) in controlling the banded fruit weevil *Phlyctinus callosus* (Schonherr 1826), and their impact on other invertebrates in apple orchards in the Western Cape Province, South Africa. Agricultural Ecosystems & the Environment 55:169–179.