me first...?

THE HOT HORNBILL'S DILEMMA

SOUTHERN YELLOW-BILLED HORNBILL ALBERT FRONEMAN

As a consequence of global climate change, southern Africa's Kalahari has been steadily warming in recent decades. Already the hottest desert in the region, these rising temperatures pose potential problems for the birds living there. Not all species are likely to be affected equally, and a major research programme at the Fitztitute is attempting to identify which species are the most vulnerable to changing conditions, and why.

Part of this work involves the identification of 'critical temperatures', those at which aspects of the bird's life history are changed by the environment. For example, when daily maximum temperatures exceed 36 °C, most Southern Pied Babblers *Turdoides bicolor* are unable to maintain their body weight, even when they do not have dependent young. The ability of Common Fiscals *Lanius collaris* to provision their chicks is compromised at substantially lower temperatures.

Hornbills in the Kalahari (and other hot places) may face unique challenges in a warming world. All hornbills are cavity nesters and, with the exception of the two ground-hornbills, the female is sealed into the cavity during incubation and much of the chick-rearing period. During this time, she undergoes a complete moult (meaning she cannot safely leave the nest chamber as her ability to fly is compromised), and the male is totally responsible for feeding the female and young. The fate of the entire breeding attempt thus lies almost wholly with the male and depends on the decisions he makes.

On hot days, food availability for hornbills is likely to decrease as prey bury themselves in the sand to avoid the searing heat. At the same time, the costs to the male in obtaining food increase, making both his water and energy budgets increasingly precarious. As this situation worsens, the male is faced with a very significant decision: either abandon his family to save himself or continue to attempt to provision the family, with the real attendant risk that he himself may die through dehydration or starvation. A necessary corollary of the latter decision would be that his whole family would die, unless the female had completed her moult and could thus, in theory, save herself.

The selfish-gene hypothesis predicts that the male should sacrifice his family to save himself. Indeed, we do find occasional female Southern Yellow-billed Hornbills *Tockus leucomelas* dead within their nest chambers, suggesting that this might be the case. Getting to the bottom of the male decision-making process in these hornbills is the subject of a new PhD at the Fitztitute, now in its first season of field work at the Kuruman River Reserve, near Vanzylsrus in the Northern Cape. The research is being undertaken by Tanja van de Ven, supervised by Profs Phil Hockey and Andrew McKechnie, and Drs Susie Cunningham and Tom Flower.

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