HOT BIRDS go global

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The Fitztitute's research programme on climate change and arid-zone birds, otherwise known as the Hot Birds project, marks its fifth birthday in 2014. The brainchild of the late Professor Phil Hockey, the project seeks to understand the ways in which temperature affects the ecology and physiology of birds in desert habitats, with a view to more accurately predicting the ways in which climate change will affect arid-zone bird communities.

The Hot Birds project initially consisted of a small team of Fitztitute and University of Pretoria researchers based at Tswalu Kalahari Reserve, but subsequently grew rapidly and now involves a sizeable team of students and postdoctoral fellows working at multiple sites in the Kalahari and elsewhere in the region. The project has also expanded far beyond the borders of southern Africa, through collaborations with overseas-based researchers.

One of the multinational projects in which the Hot Birds team is currently participating focuses on understanding the ways in which birds deal with extremely hot weather. This information is vital for predicting avian survival during extreme heatwaves of the future, when maximum air temperatures will be up to five degrees higher than at present. The research, which is taking place in the Sonoran Desert of North America, the Kalahari, and Australia's arid interior, examines how factors such as body mass and evolutionary history determine the abilities of birds to offload heat by evaporation and avoid lethal heat stress.

A second project focuses on rapidly assessing the susceptibility of various species to heat stress through observations of their behaviour. Research in the Kalahari during the Hot Birds' first few years revealed that birds vary significantly in terms of the temperatures at which they start showing heat-dissipation behaviour, such as panting. In 2012, Grace Russell, an Honours student at the University of Western Australia, collected a similar data set for a handful of Australian species, providing the first opportunity to examine similarities and differences in heat-dissipation behaviour between the desert avifaunas of two continents.

In 2014, two Hot Birds team members at the University of Pretoria, PhD student Michelle Thompson and Honours student Nicholas Pattinson, will spend six weeks collecting data on heat-dissipation behaviour in birds in the Sonoran Desert. Funded by a grant from the US National Science Foundation, this project will provide the basis for a comparative analysis of this behaviour among phylogenetically diverse bird communities inhabiting three of the world's major desert regions.

These two projects offer opportunities to examine – on a global scale – the ways in which physiology and behaviour determine desert birds' vulnerabilities in the face of more intense and frequent heatwaves. The data they generate will permit the development of more biologically realistic models of how desert birds are likely to fare under future climate scenarios. They will also allow us to identify those species likely to be among the first affected and to prioritise conservation actions based on an understanding of current as well as future threats.

ALBERT FRONEMAN

Comparing southern African birds like this Scaly-feathered Finch to ecologically similar species in Australia and North America will allow the Hot Birds team to model the responses of arid-zone birds to climate change at a global scale.

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