

## ABSTRACT

Climate change is influencing environmental temperatures and rainfall, affecting species' functioning and survival across the globe, through direct and indirect impacts. In much of southern Africa, increasing air temperatures and greater variability in rainfall are occurring, with droughts likely to become more common. An indirect consequence of these climatic changes is a change in the availability of food resources for animals. In recent years in the arid zone Kalahari, a decline in ant and termite numbers (as reflected by pitfall traps) has been associated with starvation and reduced reproductive output in aardvarks (*Orycteropus afer*) and pangolins (*Smutsia temminckii*), both specialist feeders on ants and termites (myrmecophagous mammals). Bat-eared foxes (*Otocyon megalotis*) are also myrmecophagous mammals found in the Kalahari and other semi-arid and arid regions of eastern and southern Africa. Bat-eared foxes alter the structure of vegetation when digging for prey and control the termite populations in an area by consuming large numbers of these insects. Bat-eared foxes also are known to influence the dynamics of disease in an ecosystem by being a vector to several viruses. Comparable to aardvarks, their preferred prey is the Northern harvester termite (*Hodotermes mossambicus*). However, unlike aardvarks and pangolins, bat-eared foxes have been shown to have a much more generalist diet, and feed on other invertebrates as well as plants, and even reptiles and small mammals. It is established that animals with a generalist diet are likely to be better off in changing environments than are specialist feeders. To determine whether bat-eared foxes are likely to cope better with the effects of climate change in the Kalahari compared to aardvarks and pangolins, I investigated the seasonal dietary flexibility of bat-eared foxes at a time when long-term pitfall trap monitoring at my study site (Tswalu Kalahari Reserve) had revealed low availability of their preferred prey (*H. mossambicus*). I assessed the diet of bat-eared foxes over that year using collected scats from bat-eared foxes from March 2019 to March 2020 and described the availability of invertebrates using pitfall traps. I further investigated whether there was a seasonal change in the active periods of bat-eared foxes by observations of their activity periods over the year. During the year of study, Tswalu experienced lower than average rainfall, impacting the grass productivity and invertebrate prey availability. There was no linear relationship between rainfall and

grass cover, or between environmental temperatures and grass cover. The numbers of invertebrates in pitfall traps did not correlate with grass cover or rainfall. Ants were by far the most common item found in the traps, occurring at about 35-fold the numbers of termites. Despite the apparent low number of termites, as reflected by the traps, bat-eared foxes consumed harvester termites throughout the year, with termites comprising more than half of their diet in all seasons. Ants made up almost a quarter of the dietary items, while bat-eared foxes also consumed other invertebrates as well as plants. Bat-eared foxes changed their activity period seasonally, being more diurnal in the cooler months, possibly to overlap with the activity of their preferred prey. Despite the low numbers of termites found in traps, bat-eared foxes were able to locate and continue to feed preferentially on harvester termites. Their ability to source termites and their dietary flexibility indicate that the bat-eared fox may be able to cope relatively well with the ongoing and predicted effects of climate change in the Kalahari.