

## Research Activities at the Kalahari Research Centre

### CAPE GROUND SQUIRRELS

Cape ground squirrels are diurnal, social Sciurids. They live in large multi-holed burrow systems in groups that show some sexual segregation. Female groups usually comprise two to four adult females and a similar number of subadult individuals of either sex. When a female comes into oestrus, males often move into the female's burrow system or prospect at the group seeking matings. Males have been suggested to have a strict dominance hierarchy within their groups structured by age. It appears that older males solicit more matings than younger individuals, though there is a strong element of scramble competition to squirrel reproduction where a female will mate with multiple males. Males have therefore evolved large testes in response to intense sperm competition. Females can produce up to three litters a year and often move into a temporary 'birth burrow' to give birth and look after pups in their early dependence, and this is likely a counter-strategy to reduce infanticide. Throughout the day ground squirrels forage on a combination of seeds, bulbs and foliage.

For the past nine years numerous ground squirrel groups have been intensively studied with life history, morphological and behavioural data being collected by volunteers. These data are used to investigate how altered rainfall-drought cycles in combination with increased temperatures are predicted to impact individual animals and population dynamics of species. To determine if climate changes influence body conditions and survival of Cape ground squirrels and meerkats, we analyse the life history, behavioural and body mass data at an individual level in relation to seasonal changes. Understanding the level of behavioural plasticity of species in an arid environment can provide insight into survivability of animals exposed to increasing temperatures and decreasing rainfall resulting from climate change. Volunteers play an integral role in ensuring data are collected year-round and squirrel groups remain habituated.



#### **The work of a ground squirrel volunteer**

Volunteers start their day off early in the morning at a squirrel group's last known sleeping burrow. Once the squirrels emerge from their burrow peanuts and seeds are used to persuade each individual into an electronic scale to measure their body weight. The squirrels are marked with non-toxic dye to help volunteers differentiate each individual and these dye marks are often touched up during the weighing session. Once all members of the group have been weighed

the volunteer begins gathering ad libitum behavioural data, including but not limited to, social interaction and grooming activity of all individuals. Following this, focal data are collected from specific dominant and subordinate group members. Morning sessions can take between 3 - 4 hours, with a data collection cut-off time of 6 hours. Once the session is complete, volunteers return to the research centre and for data entry, administrative duties and a lunch break. Midday breaks can vary in length depending on the season as the squirrels greatly reduce activity during the heat of the day.

Volunteers then return to the field for a late afternoon session to weigh the squirrels and collect more data. This session ends once all the squirrels of the focus group have gone below ground into their sleeping burrow. Once again, volunteers return to the research centre for data entry and finally end off the day with a delicious cooked dinner.

Training for volunteers includes correct procedures relating to habituation of squirrels, data collection, captures for morphological measurements under veterinary supervision, in field ultrasound scans of suspected pregnant females, and necessary administrative duties. Ground squirrel volunteers work five and a half days a week, with one day completely off and Sundays obtaining morning- and afternoon weights only.

#### **Example references:**

Samson & Manser. 2016. Use of the sun as a heading indicator when caching and recovering in a wild rodent. *Scientific Reports*, 6, 32570.

Samson & Manser. 2016. Are Cape ground squirrels (*Xerus inauris*) sensitive to variation in the payoffs from their caches? *Ethology*, 122, 588-596.

Samson & Manser. 2015. Caching in the presence of conspecifics: Are Cape ground squirrels sensitive to audience attentiveness? *Animal Cognition*, 2016, 19, 31-38.