



Session 9: Wildlife

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Tree trends in protected areas adjacent to the Kruger National Park

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We accept that the aesthetic value of large trees is as valid an aspiration as the more 'concrete' objectives like preventing biodiversity loss. The potential decline in tall trees due to elephant and associated potential knock on effects such as fire is therefore a concern and forms the focus of this study. Elephant can modify habitats rapidly and extensively, and as such may precipitate a cascading effect through the ecosystem, affecting many co-existing plants and animals. It is contended that a manifestation of high elephant densities and fire is a loss of large trees and perennial grasses which could lead to bush encroachment, and a concomitant loss of sensitive grazing species, so that the vegetation is replaced by short closed woodland with an increasing number of mixed feeders and browsers.

To investigate the impact of elephant and fire we examined 22 years of tree data (response variable) from the Sabi Sand Wildtuin (SSW). We focused on *Acacia nigrescens* to determine the impact of elephant and fire that may lead to elevated mortality through direct impact or be magnified by attributes that affect selection and the manner of utilisation which render the trees vulnerable to higher mortality rates (e.g. fire).

There was a decline in overall woody density throughout the SSW. This was reflected in the *Acacia nigrescens* population (22 years) where an examination of the trends per height class showed declines within the 0 – 1 m and >5 m layers, a stable 1.1 – 2 m layer and an increase in density within the 2 – 5 m layer. We argue that the declines were linked to fire and herbivory and herbivory and fire respectively. There is evidence that the increase in the density within the 2 – 5 m layer was a response of the tree layer to a weakened grass layer following a drought which resulted in this class escaping the fire trap. These findings may have longer term implications for these savannas where structural homogenisation is a concern.

Keywords: elephants, fire, physiognomy, species composition, woody component



The diet and ecology of introduced giraffe in Subtropical Thicket vegetation within the Little Karoo region of South Africa

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The existing controversy surrounding the benefits and risks of introducing giraffes outside their natural ranges have led to contradicting conclusions on the impact these mega-herbivores have on the environment within the scientific, agricultural and land management communities. Thus, appropriate management is crucial and can only be done with the implementation of appropriate policies formulated with the support of quantifiable research. Research would give us an understanding of the behaviour of these introduced species within the receiving ecosystems, and how to mitigate possible impacts these species have on the environment, as well as how the environment influences the species. Little research has been conducted on the introduction of giraffe into Thicket biome areas within the Little Karoo region of South Africa. This study attempted to understand and discuss the diet and feeding ecology of these giraffes. The feeding habits of giraffe were observed on two private game reserves within the Oudtshoorn and De Rust areas located in the Little Karoo. Direct observations were conducted on all individuals in a herd, occurring for four days every season (summer, autumn, winter and spring). Activities were recorded every five minutes from sunrise to sunset, which included the foraged plant species, level of feeding, specific location and other behavioural activities. In total, 16 different plant species were consumed. *Pappea capensis* and *Euclea undulata* formed the majority of the diet (>50%) of all giraffes for the Oudtshoorn private game reserve irrespective of sex, age and season. This occurred also for the De Rust private game reserve, however, *Acacia karroo* was observed to be dominant within the diet of adult males in summer. The height of the majority of the forage species found within the Thicket biome varies between two and three metres, and as a result, the level of the giraffe feeding was observed to be mostly at shoulder height (level 3) and below (level 2). Our preliminary findings indicate that introduced giraffes have adapted to take advantage of forage resources available in ecosystems outside their natural ranges. However, their continuous lower levels of feeding compared to when they are in their natural range, point to niche overlaps with other browsers present on the farms. This may result in increased competition (interspecific competition in addition to intraspecific competition) for food when it becomes limited during the drier summer months. These arguments show the need for long term ecological monitoring of introduced giraffes, as well as appropriate management options to avoid the displacement and degradation of indigenous fauna and flora within the Little Karoo, and possible mortalities amongst the giraffe populations.

Keywords: behaviour, diet, introduced giraffe, thicket.



Variation between seasons and height strata in availability of browse to browsing game species

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Knowledge of vegetation composition and of available browse (leaves and shoots of woody species) to browsing game species that include browsers and mixed feeders, combined with knowledge on these animals' diet preferences is essential in management of game species. This knowledge is also important when determining carrying capacity, especially in smaller fenced areas where large distance animal migration to other food sources is limited. Availability of food is a determining factor of the acceptability of habitat to wildlife. Thus, the objectives of this study were to: determine browse production and capacity in total and at different feeding heights; indicate factors that influence browse availability during different seasons; and determine if small migrations occur in search of browse resources. The study was done on a small game ranch (437 ha), north of Bloemfontein. The BECVOL model (Biomass Estimates from Canopy Volume) was used to calculate browse production in total and at different feeding heights. Browsing animals were observed while they were feeding to determine the accessibility of the total browse available to them. Habitat preferences of the animals during different seasons were also noted during observation of browsers. Browse production varied from 59 to 400 kg.ha⁻¹ between vegetation units with increasing woody density. In summer, the <2 m height stratum could sustain 7 browser units (BU: metabolic equivalent of kudu cow) and the <6 m stratum could sustain 20 BU. In areas ranging from being dominated by medium (<2.5 m) to large trees (>5 m), between 27% and 86%, respectively of available browse was out of reach of kudu and smaller browsers. Total browsing capacity of the study area in summer was 3 ha.BU⁻¹ and in late winter 60 ha.BU⁻¹ due to dominant leafless deciduous food species. Several factors influence the availability of the total browse quantity of an area, e.g. leaves that are out of reach, limited accessibility of trees in dense stands, growth form of the plant, habitat preferences of animals that exclude potential browsing areas, competition for resources, preferred food species being leafless in winter, etc. Even when restricted by fences in the study area, browsers seasonally moved to areas with denser vegetation and where other browse resources occurred. Browse in specific height strata proved to be a better indicator of availability to browsers of different sizes than total browse production of the area. Available browse in winter should determine numbers of browsers that can be stocked on game ranches during the critical period of browse shortage brought on by deciduous plants, rather than total browsing capacity as calculated in the summer.

Keywords: browse production, carrying capacity, habitat preferences, plant height, woody density.