







---

**PLATFORM PRESENTATION: A DECADE OF CHANGE IN WOODY VEGETATION IN COMMUNAL LANDS OF THE CENTRAL LOWVELD: ARE THE TRENDS AS EXPECTED?**

Wayne C Twine<sup>1\*#</sup>, Mike J S Peel<sup>2</sup> and Tony (A) M Swemmer<sup>3</sup>

<sup>1</sup>University of the Witwatersrand, School of Animal, Plant and Environmental Sciences, c/o Wits Rural Facility, Private Bag X420, Acornhoek, 1360, email: [rcrd@global.co.za](mailto:rcrd@global.co.za), <sup>2</sup>Agricultural Research Council, Savanna Ecosystem Dynamics, Range and Forage Unit, PO Box 7063, Nelspruit, 1200, <sup>3</sup>SAEON, Kruger National Park, Ndlovu Node, Private Bag X1021, Phalaborwa, 1390

---

In this paper, we compare structure and composition of woody vegetation between the 1999/2000 and 2009/2010 growing seasons in communal lands around four villages in Bushbuckridge, Mpumalanga Province. We predicted a decline in the number of large trees as a result of wood harvesting, an increase in the number of multi-stemmed trees and small stems due to coppicing, and shifts in species abundance (absolute and relative) in favour of encroaching species. We assumed that these disturbance-driven changes would be more pronounced further from settlements, as the changes would have already occurred close to villages, and intense harvesting would counter-act encroachment in these sites.

Data were collected in permanent vegetation monitoring plots of 100 m x 2 m (200 m<sup>2</sup>), which were geo-referenced and marked with steel stakes at 25 m intervals in 1999/2000. Plots were stratified between sites near to settlements (250 m – 500 m) and far from settlements (1-2 km). Of the original 34 plots established in 1999/2000, 16 were revisited in 2009/2010. The remaining plots had either disappeared due to expansion of settlements and fields, or could not be relocated due to missing pegs or inaccurate GPS co-ordinates. The species, height, number of stems, and diameter of each stem was recorded for all woody vegetation in the plots in both seasons. Data were analysed using factorial ANOVA (continuous data) and Pearson's Chi squared statistic (categorical data).

The mean number of trees (root stocks) and stems per plot increased significantly over the decade. Mean stem density increased by over 90%. However, the relative proportions of single-stemmed and multi-stemmed trees did not change over the period. The increase in number of trees was more pronounced in sites far from settlements, while the increase in stem number was similar between near and far sites. The size class distribution of stem diameter was stable (inverse-j) at both in near and far sites in both seasons, with those under 1 cm wide making up a greater proportion of stems in near than far sites. Although large trees (over 5 m high) were rare at both times, the number had increased in the far sites over the ten year period and remained unchanged near to settlements. As expected, the intermediate height classes had higher representation in far than near sites, but the relative frequency of trees less than 1 m tall had increased in far sites over the decade, to a level similar to that in near sites.

The absolute and relative abundance of the encroachers *Dichrostachys cinerea*, *Albizia harveyii*, *Acacia exuvialis*, *Combretum hereroense*, and *Ormocarpum trichocarpum*, had increased over the decade, while *Grewia monticolor* and *Combretum molle* had declined. The abundance of *Sclerocarya birrea*, *Acacia gerrardii* and *Terminalia sericea* remained unchanged, but these species were more common in sites further from settlements at times.

We conclude that the expected general trend towards bush encroachment was observed. However, the encroachment near to settlements and the persistence of very large trees in these sites was unexpected. The stability of the ratio of single-stemmed to multi-stemmed trees was also unexpected. This finding suggests, firstly, that seedling regeneration had not declined, and secondly, that much of the wood harvesting and coppice regeneration is occurring on multi-stemmed trees which have probably already been harvested and which continue to resprout. The ecological and resource management implications of these findings are explored, and recommendations are given for long-term monitoring of woody vegetation in communal lands.

**NOTES:**






