

Grassland Society of Southern Africa
**58th Annual
Congress**

Omaramba Resort & Conference Centre, Rustenburg, South
Africa

24 - 28 July 2023



PROCEEDINGS

COMPILED/EDITED BY JAMIE PAULSE-ROSS AND GRAPHICS BY MINETTE VAN LINGEN

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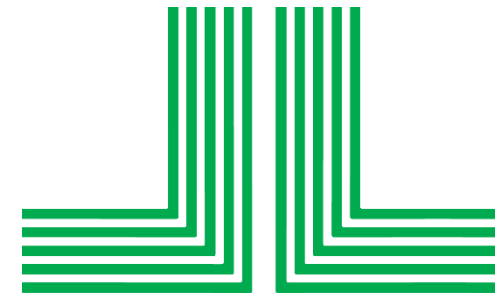
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nilotica can be preserved as silage and including seed pods and molasses can significantly improve the quality of the fodder. Further work is needed to evaluate additional quality parameters as well as intake and the impact on livestock condition after feeding the silage to livestock.

PLATFORM PRESENTATION: BRUSH PACKING AS A RESTORATION TOOL IN SAVANNA NEAR MANTHSTAD, TAUNG IN SOUTH AFRICA

*Tshegofatso Sebitloane**, Klaus Kellner, Pieter Malan, Hendri Coetzee

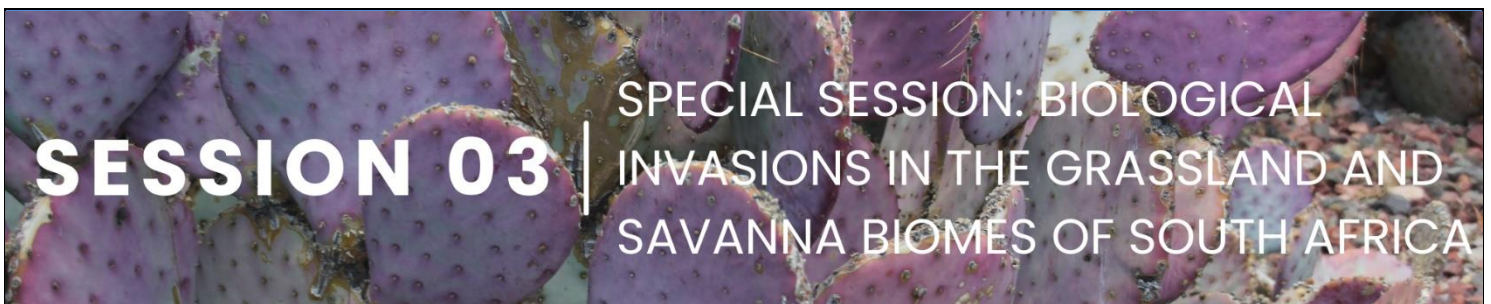
Savanna ecosystems in southern Africa are undergoing significant alterations due to the encroachment of woody species, exacerbating the effects of climate change, leading to land degradation, loss of biodiversity, and reduced grazing capacity. The aim of this study was to investigate brush-packing as restoration methods near Manthestad, Taung North-West Province, South Africa, had been cleared. The research objectives included to (1) assess the effectiveness of the brush-packing restoration method in bush-cleared areas, (2) determine grass species diversity in response to the restoration methods after the application of brush-packing, and (3) document the perceptions of the community members regarding bush encroachment, bush control, and socio-economic factors before and after the restoration activities were/was implemented. A total of 18 sample plots, each measuring 400 m², were developed, with six different restoration methods replicated three times. The treatments included: (i) no clearing (ii) clearing only, (iii) clearing and re-seeding, (iv) clearing, and brush-packing, (v) clearing, brush-packing, and re-seeding, and (vi) clearing, soil disturbance, brush-packing, and re-seeding. The impact of the treatments was monitored over a period of three years (2018–2020). Applications of the Simpson index and Shannon indices revealed that grass species diversity ($p < 0.001$) and richness ($p < 0.05$) were significantly higher over the years in all restoration treatments that included brush-packing namely treatments iv, v, and vi. The highest biomass accumulation was recorded for the treatments where bush clearing, soil disturbance, brush-packing, and re-seeding was applied i.e., treatments v and vi. The lowest grass biomass was recorded in the clearing-only restoration treatment (ii) plots. Results from the socio-economic survey showed that bush encroachment had a significant negative impact on the socio-economic status of livestock owners and households by affecting their livelihoods and well-being. However, implementation of the brush-packing treatments contributed to job creation initiatives and poverty alleviation, thereby improving the livelihoods and well-being of the Manthestad community. Effective restoration of encroached and degraded regions must however be viewed as a long-term commitment and not a once-off activity.

STANDARD POSTER PRESENTATION: BUSH ENCROACHMENT IN SUB-SAHARAN AFRICA: CAUSES, IMPACTS, AND MANAGEMENT STRATEGIES - A REVIEW

*Sawsan Hassan**, Mounir Louhaichi

Bush encroachment is a pervasive ecological phenomenon that poses significant challenges to the rangelands of Sub-Saharan Africa, adversely affecting ecosystem dynamics, biodiversity, and local communities' livelihoods. This study aims to provide a comprehensive analysis of bush encroachment in Sub-Saharan Africa's countries, focusing on the causes, impacts, and management strategies associated with this widespread ecological phenomenon. The study synthesizes a wide range of literature, including peer-reviewed articles, reports, and case studies, to examine the factors contributing to bush encroachment. Climate change is primarily caused by prominent global factors such as burning fossil fuels, deforestation, and livestock farming. These activities significantly amplify the levels of greenhouse gases in the atmosphere, intensifying the greenhouse effect and resulting in global warming. This phenomenon, often accompanied by altered rainfall patterns and increased temperatures, has emerged as a key driver of bush encroachment in the region. Additionally, land use practices such as overgrazing and inappropriate fire management, along with the introduction and spread of invasive species, contribute to the expansion of woody vegetation into grass-dominated areas. The impacts of bush encroachment on biodiversity are multifaceted. It leads to a reduction in plant diversity, as shade-tolerant woody

species outcompete grasses for resources, resulting in a shift in species composition and habitat degradation. This has cascading effects on other ecosystem components, including insects, birds, and mammals that rely on specific vegetation types for food and shelter. Moreover, bush encroachment poses challenges for livestock production, as it reduces the availability and quality of forage, leading to decreased carrying capacity of rangelands and potentially compromising the sustainability of livestock enterprises. Water resources are also affected, as increased tree cover can lead to higher water consumption and reduced groundwater recharge in arid and semi-arid regions. To address the challenges posed by bush encroachment, various management strategies have been employed. Prescribed burning, where controlled fires are used to control woody vegetation, has shown promise in restoring grassland ecosystems and reducing the dominance of woody species. Rotational grazing, which involves moving livestock between different grazing areas, helps prevent overgrazing and allows for natural regeneration of grasses. Selective tree removal, either through manual methods or use of mechanical equipment, can be used to reduce the density of woody vegetation. Additionally, reseeding with desirable grass species can enhance forage availability and restore grassland productivity. The findings of this review highlight the importance of adopting integrated land management approaches that combine ecological restoration with sustainable livestock production. Such approaches can help restore ecosystem functionality, support biodiversity conservation, and improve the socio-economic well-being of local communities. However, effective bush encroachment management requires collaborative efforts among policymakers, land managers, and local communities. Science-based strategies, informed by research findings and local knowledge, should be developed and implemented by leveraging the expertise of skilled extension officers, who offer guidance and support to land-owners and subsistence stockowners, ensuring the sustainable management of rangelands in Sub-Saharan Africa.



SESSION 03

SPECIAL SESSION: BIOLOGICAL INVASIONS IN THE GRASSLAND AND SAVANNA BIOMES OF SOUTH AFRICA

SESSION CHAIR: THABISO MOKOTJOMELA

Tuesday 25 July 2023, 14:00 - 16:00

PLATFORM PRESENTATION: THREATS OF INVASIVE ALIEN SPECIES TO CRITICALLY ENDANGERED WOODBUSH GRANITE GRASSLAND (WGG) IN LIMPOPO PROVINCE, SOUTH AFRICA.

Moleseng Claude Moshobane

Urbanisation is widely acknowledged to induce changes in species composition, particularly in urban and surrounding regions, through intentional introductions. The 2017 South African National Status Report on biological invasions has revealed that invasive alien species' invasion status remains poorly understood in several regions of the country, including the critically endangered Woodbush Granite Grassland (WGG) in Limpopo Province. Consequently, this investigation aimed to examine the status of alien plant species in the WGG area. A roadside survey was conducted in the vicinity of Haenertsburg Village, employing roads as survey units, with the dumpsite serving as a high-risk region. A total of 136 species belonging to 46 botanical families were identified. The present study reports the occurrence of 72 species that are regulated by South Africa's National Environmental Management: Biodiversity Act (NEMBA, Act 10 of 2004). The findings of this study significantly differed from existing databases ($\chi^2 = 16.334$, $p = .0001$). The list includes alien species that necessitate urgent eradication, such as *Coreopsis lanceolata* L., *Cytisus scoparius* (L.) Link, *Iris pseudacorus* L., *Pueraria montana* (Lour.) Merr, and *Rubus* species as NEMBA category 1a species. The illegal dumping