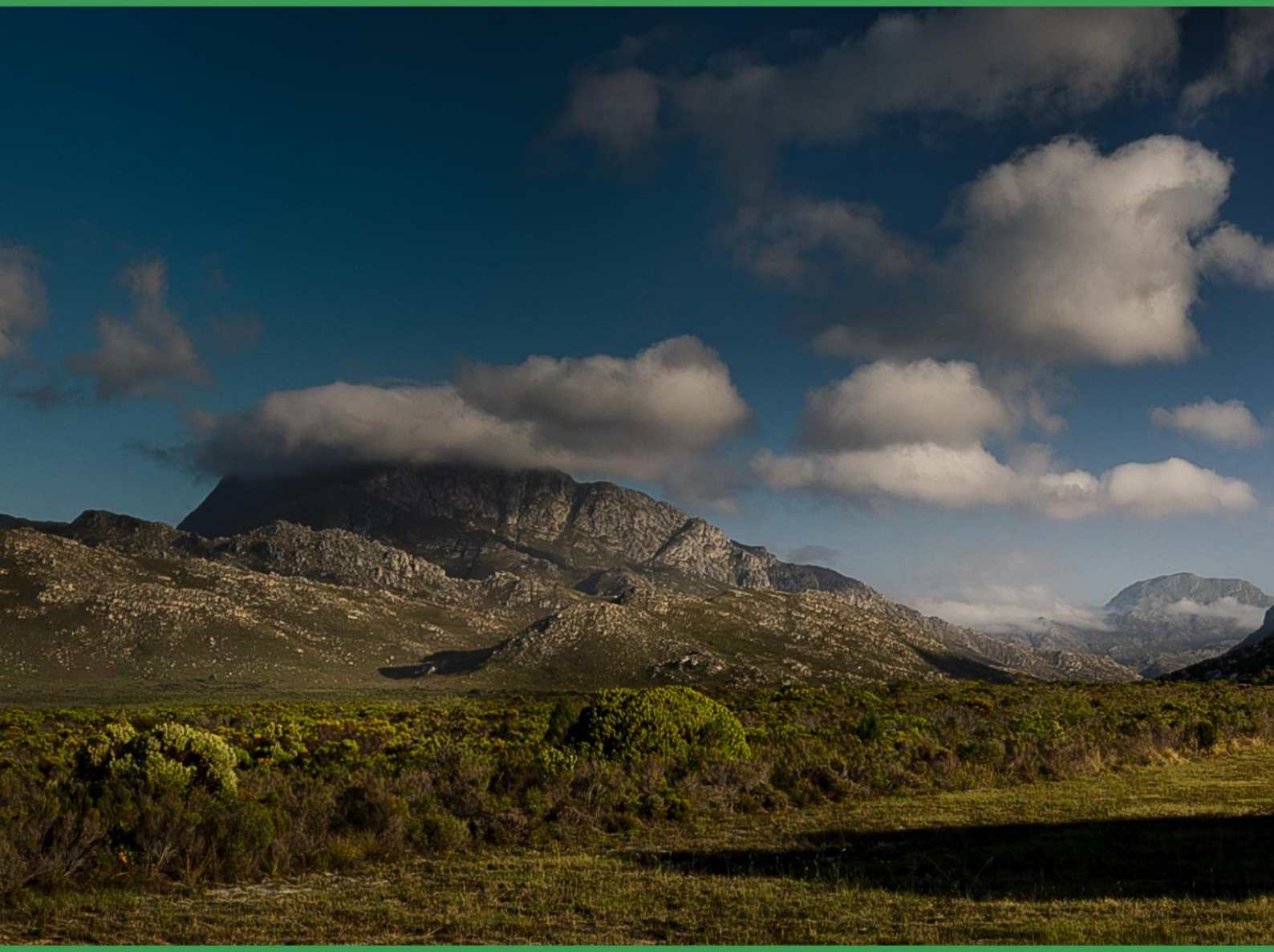
Grassland Society of Southern Africa

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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encroachment in these areas. Overall, the sites that were more frequently burnt had a higher plant species richness and diversity in both communal areas and reserves. Most of the low burn frequency sites had one or a few particular species dominating the veld, such as in the unburnt site in Toyana which dominated by *Aristida juncifromis*. From the VCA, it can be deduced that the frequently burnt sites had a better veld condition in both reserves and communal areas. Tree density was similar in frequently and infrequently burnt sites in communal areas and reserves. However, woody encroachment seemed to be more prevalent in infrequently burnt sites in reserves. These findings lead to the inference that varying fire regimes do have an effect on the plant species composition and diversity, as well as on the veld condition of KZNSS patches. It could also be inferred that fire regimes do have an impact on woody establishment.

PLATFORM PRESENTATION: IMPACTS OF WILDFIRES ON THE NORMALIZED VEGETATION INDEX (NDVI) IN THE PENDJARI BIOSPHERE RESERVE (BENIN)

Elodiade Houindote, Thierry D. Houehanou, Marcel R.B Houinato*

Biodiversity conservation is an important aspect of ensuring the future viability of our ecosystems. To this end, in the Pendjari Biosphere Reserve (PBR), the present study was conducted to investigate the effect of active fires on the normalized vegetation index (NDVI). Specifically, the aim was to (i) assess the evolution of vegetation responses to active fires; (ii) evaluate the spatiotemporal dynamics of vegetation in active fire zones; and (iii) predict the behavior of vegetation under the effect of active fires. For this purpose, Moderate Resolution Imaging Spectroradiometer (MODIS) Terra Vegetation Indices 16-Day L3 Global 250 m (MOD13Q1) and MODIS collection 6 Burned Area (MCD64A1) active fire data were downloaded over 19 years. Using ArcGIS software, NDVI pixels from MOD13Q1 images were overlaid on MCD64A1 pixels to construct NDVI images for each active fire. Similarly, the spatiotemporal dynamics of the vegetation were mapped. The annual rate of change of vegetation before and after active fires was calculated using the Ranson equation. Furthermore, a prediction was made with the Autoregressive Integrated Moving Average (ARIMA) model to identify the effect of fires in the future. The results of the vegetation prediction for the year 2030 showed a decrease in NDVI values with an increase in the frequency of active fires. The spatiotemporal dynamics of the vegetation indicated a regressive evolution from dense to open vegetation formations. The analysis of variance (ANOVA) shows a highly significant difference ($p< 0.05$) between the temporal NDVI within and between fire types. The NDVI prediction suggests a regressive trend symptomatic of degraded vegetation. These results are important for further studies on the effect of wildfires on single factors of biodiversity in ecosystems subject to fire frequencies.

STANDARD POSTER PRESENTATION: FIRE MANAGEMENT FOR HEALTHY RANGELANDS IN SUB-SAHARA AFRICA: A REVIEW

*Mounir Louhaichi, Birikaa Olesikilal, Sawsan Hassan**

Fire is a natural and essential process that has shaped rangeland ecosystems in Sub-Saharan Africa for centuries. In recent times, however, the use of prescribed burning as a management tool has gained significant attention due to its potential benefits for ecological restoration, biodiversity conservation, and land management. In fact, many rangeland ecosystems have evolved with and adapted to fire and depend on fire for habitat vitality and renewal. Many rangeland plant species depend on fire to germinate, establish or to reproduce. When fire is suppressed, the species, and the animals that depend on them, are eliminated. Fire suppression may either remove important functions of fire that are needed for these species to survive, or may simply enable competing species, which are fire-intolerant, to out-compete them. Different ecosystems have adapted differently to fire and there are no simple prescriptions for fire management. Fire-sensitive ecosystems may need complete protection from human-caused fires, whereas fire-dependent ecosystems need to be subjected to the right type and frequency of fire to maintain ecosystem health. Invasive plants can complicate fire management and may require changes to the fire regime. Currently, there is limited use of prescribed burning for active vegetation

invader plants. Three categories of invasive alien plants are recognised in terms of CARA: Category 1 plants may not occur on any land or inland water surface other than in biological control reserves; Category 2 plants may not occur on any land or inland water surface other than a demarcated area or a biological reserve and a permit should be obtained in terms of Regulation 15B(3) of CARA with the Department of Agriculture, Land Reform and Rural Development (DALRRD) while Category 3 plants shall not occur on any land or inland water surface other than in biological reserve excepts for plants already in existence at the time of the commencement of Regulation 15. Amongst other things, this presentation discourages lack of cooperation amongst stakeholders that often result in the creation of gaps, limitations, or contradictions when the legislation is formulated, and implemented on the ground; or when the need for amendment arises to better that legislation or policy. It is imperative to know that good legislation and/or policy alone is not sufficient to control problem plants unless there are competent authorised people to administer it effectively and efficiently on the ground. The formulation of environmental policy and/or legislation should embrace an interdisciplinary approach that includes natural science, technology, law, and socio-economic aspects, together with the direct involvement of relevant stakeholders. In conclusion, this presentation also serves as the basis of improving human behaviour which will have positive outcomes for the natural environment for better grassland ecosystems and food security.

THE REGULATION OF ALIEN AND INVASIVE SPECIES AND THE PERMITTING PROCESS IN SOUTH AFRICA

*Livhuwani Nnzeru**

Alien and invasive species are a major global concern due to their widespread negative impacts on biodiversity and agriculture. The Alien and invasive Species Regulations were published on the 01 August 2014 and came into effect on the 01 October 2014. It was amended in 2020. In this talk we briefly provide an overview of regulating alien and invasive species in South Africa. The purpose of the regulation is to prevent the illegal introduction of alien and potential invasive species into the country and to regulate listed invasive species and potential invasive species within the country. The permitting process allows the utilisation of invasive species under permit conditions. The requirements for lodging an application are further explained. Compliance and enforcement measures in place to promote compliance with the regulations.