

PRESCRIBED BURNING EFFECTS ON PLANT
AND ANIMAL COMMUNITIES ON THE KIBOKO
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ABSTRACT

This thesis presents results of responses of plant and animal communities to a late dry season prescribed burning. Comparisons are made between a paddock burnt in March 1984 and its unburnt neighbour. Comparisons in terms of density and biomass density of large herbivores between paddocks burnt at different dates are also made.

The fire was effective in reducing the number of plant species, the total density as well as the canopy area per hectare both for the understorey and overstorey species. Thus fire is a powerful tool in reducing bush encroachment at KNRRS. The burn induced an increase of 1.65% in total density of herbaceous species while the density of forbs increased by 23%. Similarly the number of herbaceous species increased by 50% while the number of forb species increased by 275%. Fire affected perennial grasses adversely. Grass mortality ranged between 7.79% for Botrichla insculpta and 98.03% for Microchloa kunthii. The Bray and Curtis (1957) community similarity coefficient showed more dissimilarity after the burn between the two paddocks at the herbaceous, understorey and overstorey strata, as one would expect. Ellenberg (1956) index of similarity showed more dissimilarity only for the herbaceous layer.

Fire was also effective in killing tagged plants of most species, irrespective of their height. There

was a general trend towards reduction of canopy area and height for most species. However the number of live stems increased in most of the tagged plants as a result of the burn.

Responses of mammals to the effect of fire were very varied even within a defined group such as large herbivores. The latter generally responded to one of the following factors: visibility, availability and/or nutrient content of food and changes in the structure of the habitat (vegetation). The immediate effect of reduction of food supply on the burnt area, particularly for grazers, was for them to leave the area. However other grazers too moved into the burnt area due to better visibility. The flush of green after the rains, attracted more animals and species which feed on broader variety of plants, thus enhancing their nutritional benefits. It was also shown that burns of over one year old attracted large herbivores, mostly browsers. This study did not show any evidence of competition between wild herbivores and livestock for food resources. Dietary overlap between them is not excluded. However any wildlife/livestock conflict may arise from predation. It is suggested that killing of large herbivores at KNRRS must be based on scientific facts established by research. This has not yet been carried out.

The species composition of small mammal populations on the unburnt paddock was not very different

from that on the burnt one. Also no significant differences emerged in trap success, population size and density between the burnt and the unburnt paddock. Presumably, the small mammal populations had crashed as a result of the persistent drought which already was effective prior to the start of the study.

Finally more research is recommended. Other aspects like responses of insects, birds etc. must be included in such interdisciplinary research program if the response of the whole ecosystem to fire at KNRRS is to be known and documented.