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THE BLACK RHINOCEROS: A KEYSTONE SPECIES ?

Mike H. Knight, Hugo Bezuidenhout and J. Guy Castley.
Scientific Services, National Parks Board, PO Box 110040,
Hadison Park 8306, Kimberley, South Africa.

The black rhinoceros, *Diceros bicornis*, has been exterminated from most of its range in the savanna areas of Africa. By virtue of its mass (± 1300 kg) it is considered a megaherbivore species, yet its predominantly asocial behaviour and almost entirely browsing feeding habit has led to the notion of it being of only limited importance in the functional ecology of African savannas. The recent reintroduction of the species back into its former range has allowed us to test the hypothesis that the black rhinoceros is a keystone species. The effective management of parks may therefore hinge on our understanding of the role of the black rhino in shaping the environment. The study was undertaken in the arid (± 75 mm annual rainfall) Augrabies Falls National Park, South Area. The presence of the Orange river flowing through the park has effectively divided it into three management areas: a rhino/game area (a section with large indigenous herbivores (giraffe, eland, gemsbok, and springbok) and black rhino); a no rhino/game area (a section with the same large herbivores at comparable densities but no black rhino); and a no rhino/no game area (a large island without any large wildlife species but which periodically connected with the mainland when the river dried up in the past). A study was undertaken of the plant species composition, structure, density, and utilization of the riparian woodland vegetation in all three areas. The vegetation consisted of a closed canopy at about 12 m.

A phytosociological analysis showed the riverine community of all three areas to be comparable, and any changes in the habitat structure and species richness could therefore be attributed to the influence of wildlife species. Plant species richness increased from the no rhino/no game area (19 species), through the no rhino/game area (22 species), to the rhino/game area (38 species), with most of the variation between these areas (73%) being attributed to the short grass, forb and shrub growth form categories. The vegetation density (up to 2m - below which most browsing species foraged) showed the same pattern of decreasing density with increasing height in all three areas. The densest vegetation was recorded in the no rhino/no game area, through to the least dense in the rhino/game area.

The results of this study indicate the role of black rhino as a keystone species in opening up dense riverine vegetation which in turn appears to have created the opportunity for other plant species to become established. It is therefore apparent that black rhino enhance floristic diversity. How this may influence other processes such as nutrient cycling, water infiltration and the immigration of other plant and animal species remains to be studied.