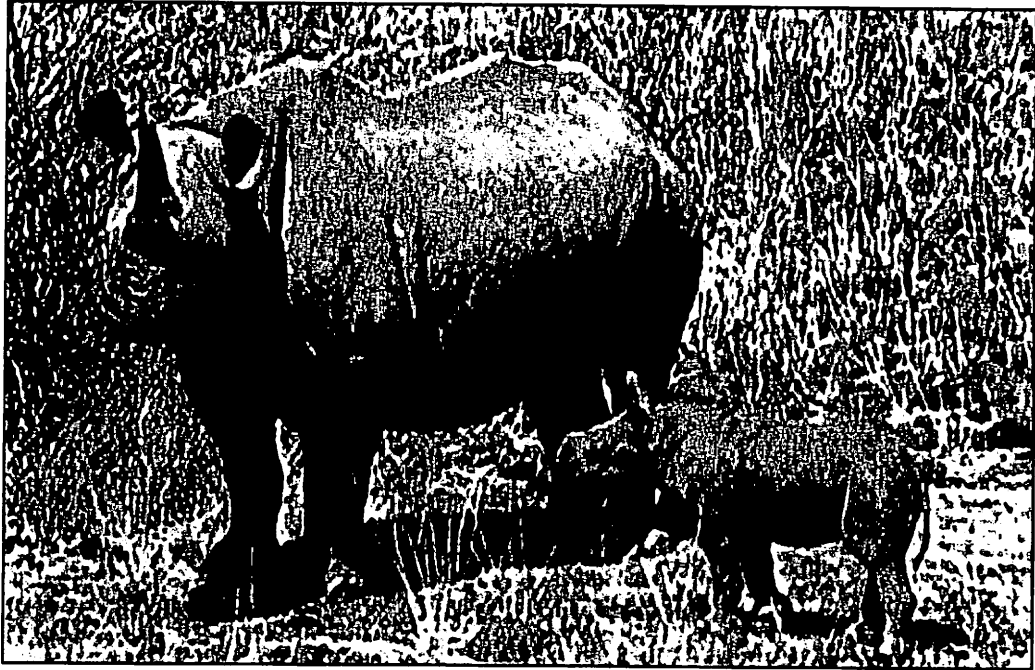


**Factors Limiting Fecundity and Movement Patterns of  
The Black Rhinoceros (*Diceros bicornis*) in Kunene  
Region, Namibia.**



by

**Michael Hearn**

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University of Kent, Canterbury

Durrell Institute of Conservation & Ecology  
University of Kent at Canterbury

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## ABSTRACT

The range patterns of females in three sub-populations of the black rhinoceros (*Diceros bicornis*) were studied in the arid rangelands of Kunene region, Namibia (mean rainfall >150mm per year), to determine the factors limiting spatial movement and fecundity. The population's growth rate across its entire range is estimated at 2% per annum for the last six years, and density is only 0.01 km<sup>2</sup>. Study sites were chosen to reflect the differing and contrasting geology of the Kunene rhino range. The three sites had similar rainfall patterns and variable breeding performance.

Using a geographic information system (GIS), seasonal availability of surface water and landform properties were assigned to each study site. Three habitats were determined from the GIS; slopes, plains, and riverine. The abundance, composition and condition of the perennial woody vegetation was measured in the three habitats of all the sites using a plotless sampling strategy, point centre quarter (PCQ). Using sightings data collected over seventeen years the range area and individual home ranges of females in the study sites were plotted and size calculated using minimum convex polygon.

Individual female home range and the sub-population range area varied across the study sites. Home range size was positively related to the proportion of slopes habitat occurring in the individual home ranges of females. In all study site the densest perennial woody vegetation occurred in the riverine habitat. The proportion of preferred perennial woody species, making up the bulk of the rhinoceros diet, was highest in the study site with the lowest mean distance to perennial and annual surface water. The smallest home ranges were recorded for the site with the highest density of female rhinos and best breeding performance. This suggested that fecundity is limited by the availability of surface water and food resources, which in turn is limited by the variable geology occurring across the three study sites.

Key Words: Geographic Information Systems, black rhino, home range, fecundity, Namibia.