2579

THE BEHAVIOURAL ECOLOGY OF THE WHITE RHINOCEROS

Rupert Norman Owen-Smith, Ph.D.
The University of Wisconsin, 1973

Reprinted from
DISSERTATION ABSTRACTS INTERNATIONAL

Volume XXXIV, Number 10, 1974

p. 5256-5257.

THE BEHAVIOURAL ECOLOGY OF THE WHITE RHINOCEROS

Rupert Norman OWEN-SMITH, Ph.D.
The University of Wisconsin, 1973

Supervisor: Professor John T. Emlen

A 3-1/2 year field study was carried out in the Umfolozi-Corridor-Hluhluwe Game Reserve Complex in Zululand, South Africa. Vegetation was mainly acacia savanna. Nearly 3000 hours of direct observation were supplemented by radio telemetry; 677 animals were recognized individually. The phylogeny and distribution of the species are outlined. Morphological and physiological characteristics are summarized, and basic motor patterns described.

White rhinos are entirely grazers using their broad lips to pluck grass close to ground level. Short grass areas were favoured for most of the year, while during the late dry season stands of tall Themeda triandra were grazed. Drinking took place only every 2-4 days during the late dry season. Wallowing in mud was frequent during summer; the mud cover probably inhibits ectoparasites. Peak activity levels occurred during the earlier morning and evening but were modified by prevailing conditions of temperature and insolation. Animals resorted to shady rest-places on ridge-crests through midday. Feeding occupied a year-round average of 48.8% of the day and resting 36.8%, with more hours devoted to feeding following spring rains.

Adult males were basically solitary. Adult females were usually accompanied by a single offspring, or alternatively by up to six adolescents. Adolescents were grouped mostly in twos. Territorial bulls occupied mutually exclusive home ranges of 0.7-2.6 km^2 which were coinhabited by 0-3 subordinate adult bulls. Cow home ranges covered 10-15 km^2 with movements restricted to a core area of 6-8 km^2 during optimum grazing conditions. The annual range included corridor extensions to long-lasting water sources.

Ten auditory displays were distinguished. Visual and tactile displays were less conspicuous. Only territorial bulls scent-marked by spray-urination, and dung-scattering at dungheaps. Resident territorial bulls confronted intruders silently horn to horn, while subordinate bulls responded with a defensive snarl displays used also by cows and immatures. Ritualized confrontations took place at territory borders. Territorial bulls also investigated cows while cows and immature animals paid little attention to one another or met nasonasally. Intragroup relationships revealed a close bond between two companions with additional adolescents of bulls more loosely attached.

Reproduction was year-round with seasonal fluctuations. Territorial bulls confined oestrous cows within their territories for 1-2 weeks, courtship advances spanned 24 hours and copulation lasted 16-28 minutes. Subordinate bulls were ex-

cluded from reproduction. Gestation period was 16 months and lactation usually continued for about a year. Ontogeny through infancy, juvenilehood and adolescence is described. Females calve at 6-1/2-7 years and males mature socially at 10-12 years. Deposed territorial bulls remained within the territory assuming subordinate bull behaviour.

Little notice was taken of other ungulates. Diseases and parasitism had few apparent effects and predation was rare. Confused responses to man are discussed.

Total population size was nearly 2000 with population densities in favourable habitat averaging 5.7 /km^2. Population trend showed a constant 9.5% rate of increase. Overall age compositions was 46.1% adults, 32.1% subadults and 21.9% calves. Adult sex ratio was 80 males: 100 females, while secondary sex ratio showed an excess of males. Mortality rates were estimated to be: adults – 2.0%, subadults – 3.0%, juveniles – 3.5%, pre- and postnatal losses – 8%. Intercalving intervals averaged 2.5 years. The absence of population regulatory changes despite habitat deterioration were related to the current prevention of subadult emigration and lower dry season populations of grazing competitors.

It is recommended that white rhino biomass be reduced by one third with increase then controlled by the removal of rhinos settling within selected "vacuum areas."

Order No. 74-3542, 863 pages.