

The effects of car density on behaviour in southern white rhinoceroses (*Ceratotherium simum simum*).

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Introduction

- In black rhinoceroses in zoos, undesirable behaviour such as pacing and black rhino mortality has been correlated with the degree of public access. No comprehensive data has been compiled for white rhinos.

- In drive through safari parks, the intrusion of cars into the rhinoceroses territory and/or high car density may lead to encroachment on the rhinos and consequently cause/ aggravate undesirable behaviour.
- Coupled with hostile public/media perceptions of keeping large flagship species in captive confinement, the situation deserves investigation.

Aim1) Test the null hypothesis: No association or correlation between the car density and undesirable behaviour.
Aim 2) To promote routine monitoring of southern white rhinoceroses' behaviour in drive through safari parks.

Method

- Five rhinoceroses from Blair Drummond Safari Park were studied from a jeep which is constantly present in the enclosure to reassure/aid visitors.

- Car density was measured by counting car numbers in the enclosure at each sampling interval. E.g. on map below, car density = 5. A LOW density.

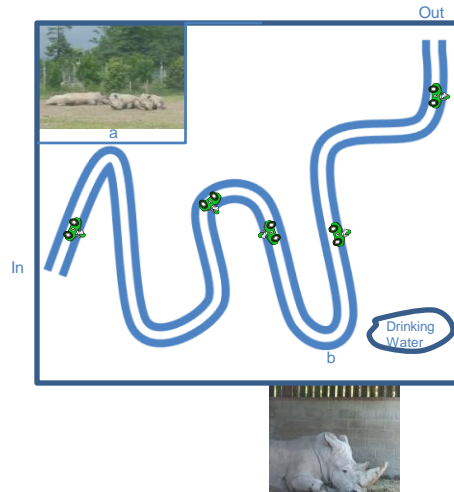


Figure 1. Roadmap of safari park. a - Enclosure group – mother (Dot ♀), calf (Maz. ♂), Jane ♀, Graham ♂. Photo shows position of their pen to which they have access.. b - Dickie ♂, older male, kept in pen at this location.

• Good aspects of study design

Use of several years personal experience of work this safari park allows one to set a completely realistic research goal –which can be continued as part of the daily routine of the park

Very inexpensive – Only field equipment required is paper and pen (important consideration to small safari parks)

Observer effect – negated

Behaviour low density ✓ Behaviour high density, measured in same individual.

•All behaviour was recorded by focal sampling at five minute intervals. Example definitions from ethogram are given in Figure 2. Traffic light colours are used to code behaviour and could be used to alert keepers to possible problems.

Undesirable Behaviour e.g.

Vigilance Stationery and repeatedly looking towards the visitors with head raised



Alertness level – is it justified?



Active behaviour e.g. Aggression

Stand-off with physical contact usually with conspecifics but may be with other animals e.g. due to rutting season for deer's.



Active behaviour e.g. Grazing: Walking slowly over different areas of grass whilst feeding on the grass.



Example Results

Animal: Graham, young male.

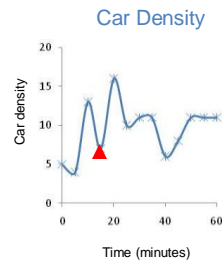
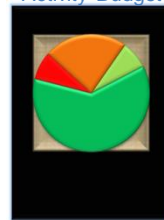


Figure 3. Undesirable behaviour . ▲vigilance, was recorded at only one sample interval. Car density at this point was 7. Colours indicate behaviour as in figure 2 . The additional light green area indicates a midden investigation.

Activity Budget



Prelim. Conclusions

Aim 1: Ongoing sufficient data is to be collected hence no conclusions on correlations between car density and behaviour can be arrived at as yet.

Aim 2: Successful: the full-time keepers and park manager are now aiming to have the seasonal staff member in the enclosure routinely record behaviour.

Adopting a colour code (traffic light) system may ease collating/understanding of data. And allow a quick comparison of behaviour from season to season at Blair Drummond Safari Park.

Discussion

The keepers have little or no direct experience of the rhinoceroses behaviour in the enclosure during opening times. Kindly agreeing to compile a database of observations throughout the season will give a sound basis to welfare management in the enclosure: ✓

Example1. access to enclosure drinking water requires a road cross and may result in the rhinos being hemmed in once they reach the water supply by the visitors vehicles. Close proximity between males becomes unavoidable. ✓

Solution: Additional water supply away from road perhaps in a hide allowing shelter from cars at high car densities.

Example 2: My own knowledge of these rhinoceroses' behaviour (i.e. they can easily raise themselves on their hind legs) allowed me to recognise that Graham was potentially capable of breaching a weak spot in Dickie's perimeter fence (see figure 2). **Now fixed!!** Keeping a database/log of behaviour would ensure such valuable knowledge from the seasonal wardens is not lost ✓

Example 3. Aiding the breeding programme e.g. by specifically logging sexual behaviour, Especially important as the calf is female and, given the failures of breeding from captive born females, a detailed record of behaviour may be crucial in helping determine causes of success or failure. This could be combined with CCTV if need be i.e. over winter. ✓

Example 4. If behavioural definitions could be agreed on, then behaviour could be compared with other drive through parks. Again a colour code system may ease such cross-park comparisons. Important because only five rhinos are under study so regardless of amount of data collected, N = 5, any extrapolation to other rhinoceroses would be a pooling fallacy. ✓

REFERENCE. Carlstead, K., Fraser, J., Bennett, C. and Kleiman, D. G. 1999b. Black rhinoceros (*Diceros bicornis*) in U.S. Zoos: II Behavior, breeding success and mortality in relation to housing facilities. *Zoo Biology* 18: 35-52.

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