Behavioural change following the relocation of Rosie, the black rhinoceros (*Diceros bicornis michaeli*)

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The black rhinoceros (*Diceros bicornis*) is highly endangered, with the population decreasing from 65,000 in 1970 down to 2,400 in 1996 (www.livingplanet.org). Poaching is the main cause of decline in numbers, this is due to the horn being worth more than its weight in gold in some countries; it is used in traditional Asian medicines, and is also used for dagger handles as a status symbol in North Yemen (www.livingplanet.org). Captive breeding is therefore an important method of conservation. Captivity has the advantages of giving endangered animals protection from poachers and the maintenance of a stable environment with constant resources. In captivity the rhinoceros represent their species for educational and fund-raising purposes, they also provide genetic and demographic reservoirs that can be used to revitalise and re-establish populations in natural habitats. The captive population is self-sustaining and genetically healthy, with 98-99% of genetic variation in the wild gene pool estimated to exist in captive black rhinoceroses (Foose *et al.*, 1993).

Relocation of animals can result in a behavioural stress response of various forms. Animals that are under stress often show stereotypic behaviours. Stereotypy can be defined as the narrowing down of an animal's behavioural repertoire (Golani *et al.*, 1999). A typical stereotypy often observed in solitary captive animals is pacing, this is commonly seen in captive polar bears, where the animal will pace around a set figure-of-eight route continuously with no apparent function (Boyd, 1991). Stereotypies, however, may help animals adapt to their environment (Manning and Dawkins, 1998); it does this by narrowing and shifting their attention which allows the animal to use limited resources efficiently to search for, and scrutinise the source of a threat (Mendl, 1999).

This study assessed the change in behaviour of the black rhinoceros Rosie after being relocated from London Zoo to Chester Zoo, on the 9th August 2000, as part of the European Breeding Programme. A barrier was placed around Rosie's pen to allow some privacy from the public. Data collection, in the form of instantaneous sampling every 20 minutes and one-zero sampling for 30 minutes at random times, took place four times a week for the first two weeks after relocation, and then twice a week for a period of six months. A total of 414 hours of data was collected over the six-month study period. Rosie's behaviour was compared to that of the female black

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rhinoceros Esther, who was kept under the same housing conditions at Chester Zoo.

Initially, after her arrival at Chester Zoo, Rosie displayed stereotypic pacing, along with having her tail elevated, for a high proportion of the day (62%) between 0800 and 1700. Having her tail elevated is an alert posture displayed by rhinoceroses and can be an indicator of stress (Smith and Read, 1992). However, by the end of October, after 10 weeks of data collection, the tail was no longer elevated and pacing behaviour had declined, coinciding with increased levels of non stress-related behaviours, such as lying and sleeping. Rosie's diurnal activity budgets between weeks 11 and 24 after relocation were very similar to those of Esther (See Fig. 1), indicating that Rosie's behaviour had normalised after week 10. Students' T-tests also showed this. This study indicates that Rosie has settled in at Chester Zoo. She is no longer displaying any stress-related behaviour and she is making full use of her paddock.

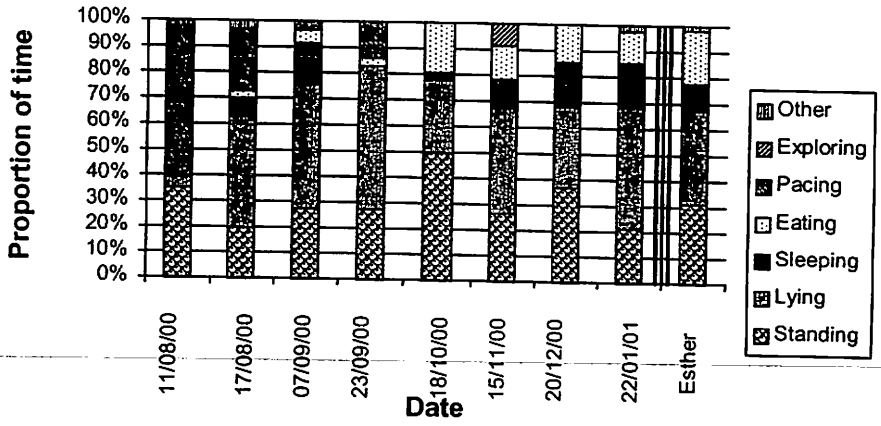

Figure 1: Examples of diurnal activity budgets for Rosie from August 2000 to January 2001. Also showing average diurnal activity budget for Esther

This study was done as an undergraduate honours project at Manchester Metropolitan University and is part of a long-term assessment of the welfare of the rhinoceros group at Chester Zoo with particular emphasis on the effect of the new exhibit. I would like to thank Dr S Wehnelt for approving the project, my project supervisor Dr J Chapman and the Rhino Section keepers, for all their help.

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EXPOSURE

Meerkats, *Suricata suricatta,* are distinctive looking mongooses ranging from Angola to South Africa. "Meerkat" is South African Dutch for "lake cat". They are diurnal omnivores with a wide and varied diet. Meerkats are frequently kept in zoos as they make a lively and active exhibit.