

TRANSLOCATION AS A TOOL TO STIMULATE REPRODUCTIVE ACTIVITY IN A FEMALE BLACK RHINOCEROS – A CASE STUDY

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Introduction

Black Rhinoceros *Diceros bicornis* are critically endangered animals with approximately 3600 remaining in the wild (*International Rhino Foundation*, 2006). In the United States, only sixty-nine of these animals represent the eastern subspecies *Diceros bicornis michaeli* (AZA Black Rhino SSP Master Plan, 2005). Failure to meet the long term goal for a self-sustaining population has plagued zoos for years and many theories exist for the sub-optimal reproduction of the species (Carlstead, *Zoo Biology*, 1999). Additionally, rhinos that have long non-reproductive periods are documented to have decreased fertility, a shortened reproductive life-span, anatomical pathologies due to prolonged endogenous sex steroids, and irreversible acyclicity (Hermes, *Anim. Repr. Sci.*, 2004). These were the concerns Zoo Atlanta faced with their 14-year old female black rhino “Rosie” in 2004.

Discussion

Zoo Atlanta has housed 1.1 eastern black rhinoceros in continuous spatial proximity to one another since 1990 when they arrived as juveniles. The first physical introductions in 1995 revealed that the male had behavioral inadequacies that affected reproductive performance and as a result, few successful copulations have ever been observed. Regular intervals of sexual interest remained consistent until sometime between 1999 and 2000, when the keepers noticed a waning of sexual responsiveness between the animals. The last unsuccessful mounting attempt occurred in 2003. Monitoring of the female’s endocrine activity through fecal sex steroids shows that in 1995/1996, she was exhibiting normal endocrine activity. A 1997 progestin analysis indicated cycling but with an erratic pattern. In 2003, the profile was at baseline, which indicated acyclicity or “flat lining”. While periods of anestrus are not unusual in black rhinoceros (Carlstead, *Zoo Biology*, 1999), Zoo Atlanta managers were concerned that the continuation of an already prolonged non-reproductive state would result in permanent senescence (Hermes, *Anim. Repr. Sci.*, 2004). Reproductive evaluations via voluntary trans-rectal ultrasound performed throughout 2004 indicated no anatomical abnormalities or pathologies. Therefore, it was concluded that Rosie’s reproductive suppression was most likely due to a combination of conspecific familiarity, behavioral incompatibility, and long-term pair social housing. Since there had been some evidence of stimulating reproductive activity in white rhinoceros through introduction to new environments (Lindburg, *Zoo Biology*, 1994), zoo managers decided that translocation of this female to another zoo was the best option to re-stimulate this animal’s reproductive functions. Rosie was translocated to the Miami Metrozoo in January 2005 where she had access to a 28-year-old sexually experienced male black rhinoceros, Toshi. In March 2005, the pair was physically introduced and successfully copulated including full penetration with intromission. Copulations and mounting sessions lasted an average of 20-50 minutes each. Breeding bouts occurred 12 times from March 2005 until January 2006 (Miami Metrozoo ISIS specimen report, 2006). Fecal steroid analysis of progestin confirmed the presence of cyclic activity October–December 2005, although length between luteal phases was slightly erratic. The analysis also revealed a period of elevated progestin which suggested, but did not confirm, a possible pregnancy from January–March 2006. The progestin returned to baseline at the end of March 2005 indicating that if this was a pregnancy, there was an early embryonic loss. A blood serum analysis conducted July–August 2006 showed a normal rise in progestin suggestive of cyclic activity again. Rosie returned to Zoo Atlanta in April 2006 and is awaiting further recommendations. Because this female is likely to continue cycling for a short time, managers can now consider this female a viable candidate for future breeding opportunities.

Conclusion

Undoubtedly, translocation or transportation of wildlife from one geographical location to another (Leighton, *Rev. Sci. Tech.*, 2002) is associated with many risks including stress, trauma, and possible death. Although implications of such moves on animals’ reproductive health are rarely studied or understood, it is readily accepted among animal managers that moves can enhance or stimulate the reproductive state in many animals including rhinoceros and cheetahs (Lindburg, *Zoo Biology*, 1994). Although it’s unfortunate that many reproductive years of this female were spent with a behaviorally inadequate partner, the combination of an unfamiliar experienced male, enriching new circumstances, and short-term acute stress brought this female into breeding condition rapidly. This husbandry tactic was successful and we encourage other rhinoceros managers to consider it as a way to stimulate reproduction in the captive population.