

MS Thesis Defense

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Title: Genetic Diversity Of Two Subpopulations Of Black Rhinoceros, *Diceros Bicornis Bicornis*, At Addo Elephant National Park, South Africa

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ABSTRACT

Due to international initiatives to increase the efficacy of conservation programs, the critically endangered black rhinoceros is making a tenuous recovery from significant population declines (Emslie & Brooks, 1999). However, as this species has slow maturation and reproduction rates, maximizing the productivity and genetic health of remaining populations is crucial to conserving this iconic animal. Assessing genetic diversity of a threatened population using mitochondrial DNA (mtDNA), a maternally inherited molecular marker, can elucidate the genetic viability of populations and subsequently inform conservation strategies (Frankham, Ballou & Briscoe, 2010). Using mtDNA, this study assessed the genetic diversity of two subpopulations of the southwestern arid subspecies of black rhinoceros, *Diceros bicornis bicornis*, (*D. b. bicornis*) at Addo Elephant National Park (AENP), South Africa. A total of 112 noninvasively collected fecal samples were assayed including 87 samples from the Nyathi subpopulation, 24 samples from the Addo subpopulation and one sample collected outside of the park. Identities were assigned to the samples when possible. Only two mtDNA D-loop haplotypes were identified. Low genetic diversity of this marker could indicate that the population is at risk of inbreeding (Frankham, Ballou & Briscoe, 2010), which could have serious implications for small populations like the *D. b. bicornis* at AENP. This study also described a new set of primers that amplify the polymorphic region between the two haplotypes identified at AENP, providing a new tool for managers at the park to monitor the genetic variation within the subpopulations. Although additional genetic testing is recommended to further characterize the genetic diversity of these subpopulations of *D. b. bicornis*, the data reported in this study provide critical information to the managers at AENP about the potentially limited genetic variation in this important population.