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1.2.2 Development of a Science-Based Integrated Metapopulation Management Plan for the Kenyan Black Rhinoceros *(Diceros bicornis michaeli)*

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Abstract

The conservation of threatened species in the face of increasing human population pressure and habitat fragmentation, necessitates active metapopulation management. Translocations play a crucial role in enhancing gene flow among populations. In the eastern subspecies of the black rhinoceros (*Diceros bicornis michaeli*) in Kenya, translocations are vital for maintaining population growth, genetic diversity, and offsetting the effects of small population size. However, the success rates of translocations and their impact on reproductive output and physiological well-being remain unclear.

This study aims to develop a science-based metapopulation plan to promote growth and recovery of the Black rhinoceros. The research evaluates factors mediating translocation success, including mortality rates, reproductive rates, and physiological measures in source and recipient populations. It further investigates the impact of stress and distress on translocated individuals by examining multiple biomarkers from different physiological systems. The research utilizes existing rhino monitoring data in Kenya to analyze the relationship between translocation outcomes and various covariates across the black rhinoceros metapopulation. The study also explores the relationship between population density, ecological carrying capacity, and reproductive performance. By addressing factors such as stress, genetic restoration, and reproductive potential, the study will provide evidence-based guidelines for translocation practices, optimal population growth rates, and the maintenance of genetic diversity for the Kenyan black rhinoceros and other threatened species.

Keywords: Black rhinoceros, reproduction, stress, translocation