

PhD Dissertation Defense

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Title: Influence of Habitat and Anthropogenic Disturbance on the Diversity, Distribution and Abundance of Large Mammals: A Case Study Across Four Adjacent Wildlife Conservation Areas in Laikipia County, Kenya

Committee: Dr. Larry Rockwood (Director), Dr. Rebecca E. Forkner, Dr. Lee M. Talbot, Dr. David Luther

ABSTRACT

The large mammals of East Africa are a functionally diverse component of tropical savanna ecosystems and vital drivers of tourism and, thus, landscape conservation. Laikipia County, Kenya, known for harboring high African mammal diversity and a high density of a flagship species, the black rhino (*Diceros bicornis michaeli*), is a complex mosaic of public and privately owned lands. In this study, I take advantage of a unique opportunity to measure anthropogenic impacts on wildlife among four contiguous, independently managed Laikipia ranches, including one proposed as a future national park. Georeferenced habitat identification was combined with vegetation surveys on all ranches with the majority of the landscape classified as Acacia (39%), followed by grassland (25%), mixed Acacia-Euclea forest (21%), Euclea (12%), and riverine (3%). Sampling of wildlife was conducted through simultaneous camera trapping, resulting in over 150,000 image captures of 49 species. Occupancy modeling was used to test hypotheses of anthropogenic impacts (fencing, roads, areas of human activity, and artificial waterpoints) on the diversity and distribution of large mammals. Functional guilds were correlated to habitat classification, with grazers and browsers dominating the landscape. Species richness was correlated to size of ranch, but showed no correlations to habitat type or to proximity to artificial waterpoints as was hypothesized. Modeling showed a positive correlation of richness to natural rivers, fencing, and areas of human activity. These unique data across multiple privately owned properties provide an updated and holistic perspective of landscape dynamics in Laikipia. To facilitate data visualization and to promote new technological resources for land managers, a GIS was used to combine habitat classification, anthropogenic structures, and camera trapping records into an accessible, on-line interactive mapping application.