

Title: Distribution and vegetation association of grevy's zebra (equus grevyi) in Tsavo East National Park and the surrounding ranchlands
Author: Mwazo, Alexander Gombe

Abstract: Grevy's zebra (*Equus grevyi*), the world's largest wild equine, is endemic to the arid Horn of Africa. Originally, its range extended throughout the Horn of Africa but currently it is found only in Kenya and Ethiopia. The population has declined from 15,000 in the late 1970s to between 1,964 and 2,445 animals by the year 2008. The population declines as reported by Williams and Low (2004) is probably as a result of being killed for meat, medicinal purposes, loss of access to critical resources due to competition with livestock, and increasing scarcity of resources as a result of over-exploitation. The Kenya Wildlife Service is mandated to conserve and manage Grevy's zebra in Kenya. However, this mandate is hampered by lack of information on the Grevy's zebra distribution and vegetation association in Tsavo East National Park and the surrounding ranchlands. This study, therefore, investigated the distribution and vegetation association of Grevy's zebra in Tsavo East National Park and the surrounding ranchlands. Grevy's zebra distribution data was collected using a sampling route method. This involved driving along the roads and recording data of Grevy's zebra. Recorded data included the date, time, Global Positioning System (GPS) locations of Grevy's zebra and their numbers seen in Tsavo East National Park and the ranchlands surrounded by the Park. GPS locations of both natural and artificial water pans where Grevy's zebra were found were also recorded. Grevy's zebra vegetation preferences were studied by analyzing land cover maps generated from satellite images. Vegetation selection index was used to assess the most preferred vegetation types by Grevy's zebra. The association between Grevy's zebra and their vegetation types was assessed using Chi-square test. Distribution of Grevy's zebra was determined by projecting the Grevy's zebra GPS locations in ArcGIS. Point pattern analysis was used to assess the distribution patterns of Grevy's zebra and Pearson correlation was used to test the relationship between Grevy's zebra locations and distance to water pans. Results showed that Grevy's zebra live in groups with mean group size of 9.5 ± 3.08 . Ninety five percent of Grevy's zebra locations were found in ranchlands and five percent in Tsavo East National Park. Distribution patterns were clustered $R < 1$ and the mean distribution densities of Grevy's zebra in different vegetation types was 0.24 ± 0.07 . Grevy's zebra preferred seven vegetation types in Tsavo East National Park and the surrounding ranchlands while vegetation selection index showed that Grevy's zebra mostly preferred four vegetation types. There was positive correlation between Grevy's zebra locations and distance to water pans $p < 0.05$ and the mean distance of Grevy's zebra locations to water pans in different land parcels was 6251.20 ± 1798.57 meters. Chi-square test result showed an association between Grevy's zebra distribution and vegetation types $p < 0.05$. This study concluded that Grevy's zebra preferred open formation vegetation types and preferred ranchlands areas than the park. The results of this study will assist Kenya Wildlife Service and ranchlands owners to devise management and conservation strategies for the Grevy's zebra. The study recommends further research to be conducted to determine whether

competition with livestock and predation are impacting the distribution of Grevy's zebra in Tsavo East National Park and the surrounding ranchlands.