

Ecology and Conservation of elephant in Nyerere-Selous Ecosystem

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1. Introduction

Understanding and being able to predict the relationship between animal population growth and their environment has been an interesting aspect in animal ecology. Following the major decline in elephant population the Nyerere ecosystem in between 2009 and 2014 (TAWIRI, 2015) the government of Tanzania stepped in to curb poaching. The elephant population is monitored using regular aerial survey every three years but also monitoring the population structure to gate an indication of how the population is recovering.

Population structure derived from demographic parameters such as herd size, age group, cow/calf ratio, breeding adult ratio, young adult ratio and female-male ratio of the population. These are critical information for the growth of any population. The last rapid demography assessment was in 2017/2018.

1.1. Elephant Population Structure

Elephant age will be assigned in age classes (0-4, 5-9, 10-14, 15-19, 20-24, 25-39 and 40+ (Poole, 1989; Moss 1996). A group of elephants is defined as any number of elephants of any age or sex moving together in a co-ordinated manner with no single member or sub-group at a distance greater than the diameter of the main body of the group. Cow/calf group (CC) defined as any group containing one or more adult females. Males over 10 years old were not included in the group size. Individuals below 5 years old are considered as calves. Calves under 1 years of age are considered as new infants. All individuals < 10 years old will be considered as dependents. All females over 10 years old are considered as mothers. All cow-calf groups seen together with bulls are defined as mixed groups. A bull group contained only of males above 10 years old while an aggregation in this regard are all groups of elephants with more than twenty individuals with more than one family unit with or without adult males and the single adult males are considered as lone bulls (Poole, 1989). All individuals above 5 years old without tusks are considered as tuskless.

1.2. Project Rationale and Goal

Predicting the future population trends is important for conservation and ecosystem management. The distribution of the population structure can be used as an index to infer the trend and history of the population. In a growing elephant population with increasing human population and expansion of human settlement, Human-Elephant Conflict (HEC) is inevitable. Understanding the population demography will be crucial to predict the future trend and devise an appropriate management strategy including protection of the species especially at this time when poaching is high. Again it is demonstrated that female elephants that are released from poaching tends to reduce birth interval and also early pregnancy for the first time female (Owens & Owens, 2009).

Goal of the project

Updating elephant population structure and distribution in the Nyerere-Selous Ecosystem

Objective

- i. Conduct demography survey in Nyerere National Park, Selous Game Reserve, Mikumi National Park and Selous-Niassa corridor
- ii. Establishing current behavior to human approach in relation to proximity to permanent settlement and farm area
- iii. Establishing distribution patterns of the encountered groups/individuals
- iv. Records all encountered collared individuals and establish whether they active or not to facilitate the possible removal of the old collared individuals in 2018/2019.
- v. Establish the extent of knowledge on the responses on Human Elephant Interaction in the study area

2. Method

2.1. Study Area

This study will follow areas that were surveyed in 2017/2018 (Kohi et al.2018) in Matambe, Kalulu, Likuyuseka (Nyerere National Park), Kingupira (Selous Game Reserve) and Mikumi National Park. Also, will include the Selous-Niassa Corridor covering Mbarang'andu and Nalika WMAs. This study area will include Ruvuma, Morogoro and Lindi regions.

2.2. Data collection

For the purpose of this survey, the data collection will use a rapid demographic assessment (RDA) approach to quantify the population structure (Joyce Poole in 1989). This method also was used in the assessment of elephant population structure in 2009 during the development

of Tanzania Elephant Management Plan 2010-2015 (Mduma, 2011) and 2018 (Kohi et.al 2018). The method attempts to sex and age as many individuals as possible within a given population, aiming at providing a general picture of population structure at a given period of time.

The field teams will receive a refresher training in Matambwe before starting the work. The elephant will be aged and sexed using body size, tusk size and shape, body shape and head size and shape (Poole 1989). Elephant shoulder height and body weight continue to increase throughout much of their lives, but this can be highly noted in males as when they attain the age of 17 years old, their height become similar to adult female over 25 years old. For individuals below the age of ten years old, the tusk length is used more than body size. In normal circumstance, tusk eruption occurs between 18 months and two years. The body length of elephants is directly proportion to their age, the old individuals have long bodies and sag bell. The head size and shape especially in male elephants increases with age. Young adult male elephants, the line of the face from the portrait view is straight, while the adult males over 25 years old the face show on an hour glass shape (Poole 1989). The sex of elephants is described well by (Kadzo 1996). According to Kadzo, female elephants, the belly is horizontal to the ground and breasts are swollen, angular/pointy forehead and have slender tusks. Male elephants belly slopes upward from the hindlegs to the forelegs, rounded forehead and have thick and tapering tusks.

2.3. Analysis

Descriptive statistics will be used to summarise the data collected and establishing demography profile. Analysis of variance will be employed to analyze three data set for 2009, 2018 and 2024

3. Reference

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