

Project Update: May 2016

A. PROJECT SUMMARY

The Omo River guereza (*Colobus guereza guereza*) is an endemic subspecies of black-and-white colobus monkey restricted to the western Rift Valley forests of Ethiopia. Little information is available on this subspecies and it remains among the least studied primates in Africa, though other subspecies of *Colobus guereza* have been studied for decades. With habitat loss and degradation increasing across its geographic range, data on the current conservation status and behavioural



ecology of Omo River Guerezas are essential to designing effective management plans for this little known primate. This study therefore aims to provide data on the population size, abundance, habitat use, feeding ecology and activity budget of the Omo River guerezas in Wof- Washa Natural Forest, central highland Ethiopia. Standard line transect methods have been used to assess density and abundance of guerezas in the Wof-Washa Forest. Vegetation compositions in the home range of two selected study groups have been determined by vegetation transect and plot sampling method. Frequently consumed food species of plants were selected (10 individual plant per species) and their phenology have been recorded every month to assess monthly food availability. Habitat use have been assessed both by transect sampling and group scan sampling by recording the GPS location and the habitat type where each group is spotted. Behavioural ecology on the activity budget, feeding ecology and ranging patterns have also been collected using scan sampling methods for 5 consecutive days per month for each of two neighbouring study group. During 5-day samples, activity scan samples have been collected for up to five minutes duration every 15 minutes. To assess ranging patterns, GPS locations have been recorded every 15 minutes. Data on the density, abundance, habitat use, activity budget, feeding and ranging ecology are very essential to designing conservation management plan for this little-known and endemic primate of Africa.

B. PROJECT DESCRIPTION

The scarcity of information on the Omo River guereza indicates that, the subspecies has been given insignificant consideration not only by the government and non-government organisations but also from researchers. Therefore, this baseline research project will enable both the scientific and general public to open their eyes towards the conservation and study of this marginalised subspecies in Ethiopia. Accordingly, the project focuses on the intrinsic and ecological value of the Omo River guereza more than its economic incentive to increase contextually relevant ecological knowledge for the animal's long-term sustainable survival in its natural habitat.

a. General Objective of the project: The general objective of the study is to obtain a population estimate as well as data on the habitat use, feeding ecology, activity budget and ranging patterns of the Omo River guereza (*Colobus guereza guereza*) and ensure its long-term survival.

b. Specific aims of the project

1. To estimate the population size and determine the density of Omo River guereza at Wof-Washa Natural Forest.
2. To determine the habitat use and distribution of Omo River guereza.
3. To assess the activity and ranging patterns of Omo River guereza.
4. To determine the diet and foraging behaviour of Omo River guereza.

c. Study Species: This study is concerned with Omo River guereza, one of the endemic subspecies of colobus restricted in Ethiopia. Even, in contrary to the species colobus guereza that has been studied for decades in other African countries, the information available on the Ethiopian endemic subspecies is scant. This indicates that, Omo River guereza has given insignificant consideration by researchers and it remains one of the least studied primates in Africa. Therefore, my research project is the first ever study on this endemic subspecies of black and white colobus monkey.

d. Study site: The study has been conducted in Wof-Washa Natural Forest (WWNF), located in North Shoa Zonal Administration of Amhara National Regional State, Ethiopia. WWNF is perched on the slopes of the eastern escarpment of the north-western highlands. The escarpment forms part of the catchment of the Awash River system which drains into the Danakil Plains in the northern section of the Rift Valley. Wof-Washa Natural Forest is one of the central highlands and oldest natural state forests in Ethiopia. It is situated approximately between 9°37' 44"-9°46'26" N latitude and 39°44'00"-39°47'19" E longitude. Concerning the topography, the forest is situated on undulating and highly dissected mountain ranges between 1,700 m asl in the Acacia scrubland on the valley floor to 3,600 m asl at the top of the Rift Valley escarpment near on the plateau.

C. PROJECT DESIGN AND IMPLEMENTATION

The Omo River guereza is endemic to and patchily distributed in the western Great Rift Valley. Studies on its behavioural ecology and population biology have been rare. This research focuses on obtaining a population estimate and investigating habitat use, feeding ecology and activity time budget of the Omo River guereza (*Colobus guereza guereza*) and to better ensure its long-term survival in WWNF.

D. PROJECT METHODOLOGY

Climate data: Rainfall and temperature data were recorded using Oregon wireless rain gauge and Taylor digital waterproof maximum/minimum thermometer from May 2015 to April 2016. Average mean monthly rainfall and maximum and minimum temperature have been summarised.

Vegetation composition and phenology: The vegetation composition of the study area was examined from randomly selected vegetation transects across the home range of each of the study groups. A total of three 400-500 m long and 10 m wide vegetation transects were laid out using the random stratified sampling method within each of the study group (A and B) home ranges and adequately sampled the diversity of big trees ≥ 10 cm DBH (Wong *et al.*, 2006) and climbers with DBH ≥ 5 cm (Suarez, 2013). A total of six 50 m x 10 m vegetation enumeration quadrats were laid randomly within the vegetation transects.

Phenological data collection have been carried out monthly since May, 2015 for 10 food plant species in a sample of vegetation transects in the home range of each study group. Each marked tree was assessed for the relative abundance of young leaves, mature leaves, leaf buds, flowers, whole fruits (ripened and non-ripened fruit), and seeds using visual inspection or binoculars (Fashing, 2001b; Xiang *et al.*, 2007; Suarez, 2013). Data organization and analysis have been commenced for both vegetation composition and phenology.

Population estimate: Population census of Omo River guereza was conducted in WWNF in February and September, 2015 and in March 2016 using line transect method (Green, 1978; Struhsaker, 1981; Peres, 1999). Survey sites were selected to cover suitable altitudinal ranges and vegetation types of the area. A total of 12 transects ranging from 1.5 to 3.0 km length were censused crossing different habitat types (Mekonnen *et al.*, 2010b). During transect walks, GPS location, group size, group spread, estimated animal-observer distance, sighting angle (angle to trail using compass), perpendicular distance from the transect to the first animal seen, the height of the animal on the tree when first detected, and habitat type where the group is spotted were recorded when Omo River guereza and other primates are encountered (Whitesides *et al.*, 1988; Fashing and Cords, 2000; Marshall *et al.*, 2008; Mekonnen *et al.*, 2010b). Population estimation data will also be collected in January and May, 2015.

Habitat use: Habitat use by Omo River guereza in WWNF have been assessed by a combination of transect sampling in different habitat types and instantaneous sampling methods of focal groups (Mekonnen *et al.*, 2010b). Each group have been followed and its location and habitat types were recorded (Gómez-Posada *et al.*, 2007; Zhou *et al.*, 2013).

Activity pattern: Behavioural data on activity time budget, feeding, ranging ecology and habitat use were collected using instantaneous scan sampling method (Altmann, 1974) at 15-minute intervals. Activity budget data from the members of the two neighbouring focal groups (A and B) were collected on an average of five consecutive study days each month from each group (Fashing, 2001a; Mekonnen *et al.*, 2010a). During the 5-day samples, activity scan samples were collected for up to 5 minutes duration every 15 minute sampling gap (Fashing, 2001a; Wong and Sicotte, 2007). During each sample, the activity was recorded by scanning the group from left to right to avoid possible bias toward eye-catching activities such as grooming, fighting, and mating (Fashing, 2001a). The identity of the scanned individual was recorded and assigned to one of the following age/sex classes: adult male, adult female, sub-adult male, sub-adult female, juvenile male and juvenile female but not infants (Fashing, 2001a; Harris and Chapman, 2007). During scan sampling, individuals observed were recorded as performing one of the following behavioural records: feeding, moving, resting, playing, aggression, grooming, sexual activity, and others such as drinking

that do not fit in these categories (Fashing, 2001a; Mekonnen *et al.*, 2010a; Chaves *et al.*, 2011).

Feeding ecology: During activity scan sampling, when Omo River guereza is observed feeding, the type of food item as well as the species consumed have been recorded. The type of food items were recorded as young leaves, mature leaves, root, stem, flower, fruit, seeds, shoot, bark, bud or animal preys. Plant species consumed by individuals of colobus monkey were identified and recorded in the field if known while unidentified species have been identified at Addis Ababa University National Herbarium.

Ranging Pattern: Ranging data on the two study groups have been collected during two 5 focal full-day follows of each group each month (De Fiore, 2003; Mekonnen *et al.*, 2010a). During instantaneous scan sampling, the location of the geographic center of the study group were recorded at 15 minute intervals using a Handheld Garmin GPS Map 62s. The minimum convex polygon (MCP) and the best home range estimator technique (fixed kernel) methods will be used to determine the home range sizes and daily travel distance via GIS software ArcGIS version 10.2 (Fashing *et al.*, 2007; Rodgers *et al.*, 2007; Wong and Sicotte, 2007; Mekonnen *et al.*, 2010a).

