

Project Update: January 2019

Introduction

The major objectives of my project, entitled "Conservation of the endangered Ashy red colobus monkey (*Piliocolobus tephrosceles*) in unprotected habitats of western Tanzania" were to: 1) determine the Ashy red colobus monkey's distribution, conservation status (population size and anthropogenic threats) in previously unsurveyed areas, 2) study its conservation genetics, and 3) implement conservation actions in the degraded forests of the Ufipa plateau (Mbuji Forest area) as well as in the Ufipa escarpment. This report presents preliminary results of Ashy monkey's conservation threats and reports the conservation campaigns carried out in surveyed sites of the Ufipa plateau and the Masito-Ugalla Ecosystem.

The successful conservation of a primate species requires knowledge on its distribution, numbers and conservation threats. These are important to determine conservation priorities, identify areas of high conservation value and design successful management plans for the species (Kühl *et al.*, 2008), as well as to guide the creation of protected areas, corridors, buffer zones, demarcation of boundaries and tourism planning.

Ashy red colobus monkeys are folivorous monkeys that feed predominantly on leaves (Struhsaker, 1975), but supplement their diet with fruits, flowers, seeds and insects (Struhsaker, 1975, 2010; Kibaja, 2012, 2014). They exist in western Uganda and western Tanzania (Struhsaker, 2005). In Tanzania, they are found in Mbizi and Mbuji forests on the Ufipa plateau, in Gombe Stream and Mahale Mountains National Parks on the eastern shores of Lake Tanganyika (Rodgers, 1981; Davenport *et al.*, 2007) and in the Masito-Ugalla Ecosystem (Ogawa *et al.* 2004; Moyer *et al.*, 2006).

They are an endangered species (Struhsaker, 2008; 2016). Their population sizes are declining due to chimpanzee predation and habitat alterations (Watts and Mitani 2002; Struhsaker 2005, 2016). Their population size has been estimated at 20,000 individuals in all its geographic range; with the largest known population in Kibale National Park, Uganda (Struhsaker, 2005; Chapman *et al.*, 2007). Censuses conducted ten years ago in the Ufipa plateau estimated a population size of 1354 Ashy monkeys: 1217 and 137 individuals were in the Mbizi and Mbuji Forests respectively (Davenport *et al.*, 2007). The average red colobus group size has been reported as 45-50 individuals in Kibale and 55-59 individuals in Gombe (Struhsaker and Gubbs in Oates *et al.*, 2008), and 40.56 and 34.25 in Mbizi and Mbuji forests respectively (Davenport *et al.*, 2007). However, the present status of the species is unknown.

This species was reported in biodiversity surveys in the Masito-Ugalla Ecosystem (Ogawa *et al.*, 2004; Moyer *et al.*, 2006) but it has never been systematically studied in these areas. Thus, the present project intended to assess its distribution and population status and conduct conservation awareness campaigns in previously-not-surveyed areas in western Tanzania.

Methods

Study area

The study area comprised the following study sites: Mbuli Forest area and Masito-Ugalla Ecosystem in western Tanzania (Figure 1). 1) Mbuli Forest area occurs on the Ufipa plateau and encompasses the Mbuli Forest and its neighbouring areas: Chala, Ufipa escarpment and Rondokazi. The Ufipa plateau where the Mbuli Forest occurs receives 800-1200 mm of annual rainfall (United Republic of Tanzania or URTa, 1998). 2) Masito-Ugalla Ecosystem (5° 52'S, 30° 25'E, approximately 10,872 km²) is predominantly miombo woodland interspersed with evergreen forest and has relatively low human impact, receiving 955 mm of average annual rainfall (Hernandez-Aguilar, 2009). Elevation ranges from 900 to 2000 m above sea level (URTb, 1998). It possesses at least 50 mammal species including wild dogs, elephants, lions, chimpanzees and other 7 primate species (Iida et al., 2012).



Figure 1: Study area showing the study sites in western Tanzania.

Data collection and analysis

Surveys were conducted from July 2017 to August 2018 after reconnaissance surveys which began in September 2015 (Figures 2-5). Two teams comprising three people each simultaneously searched for Ashy monkeys using trails (following Peres, 1999). When a group was encountered, the number of individuals, sex and age composition, sighting distances to the group, GPS position and bearing from the observer to the group were recorded. When we encountered a group we followed it from 10 to 30 minutes to ensure that all individuals were counted. Complete counts were done in the small forest fragments of Chala and Mbuzi Forest.

Mean group size was obtained by dividing the total number of individuals from all groups by the number of groups. Population size estimates will be obtained by extrapolation from group and individual densities (that will be published soon). Faecal samples for DNA analysis were collected and preserved following Mbora and McPeck (2011). Collected samples have been kept in fridges at the University of Dar es Salaam, Tanzania.

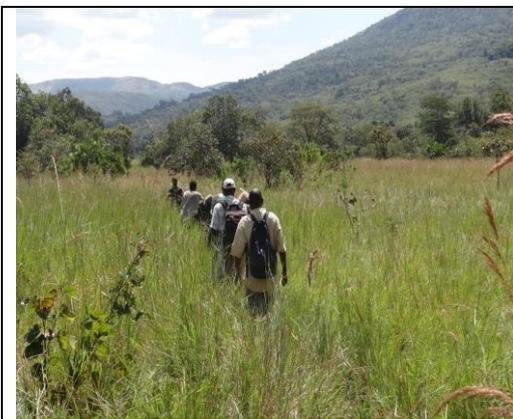


Figure 2: Teams going to interior of the Masito-Ugalla Ecosystem.

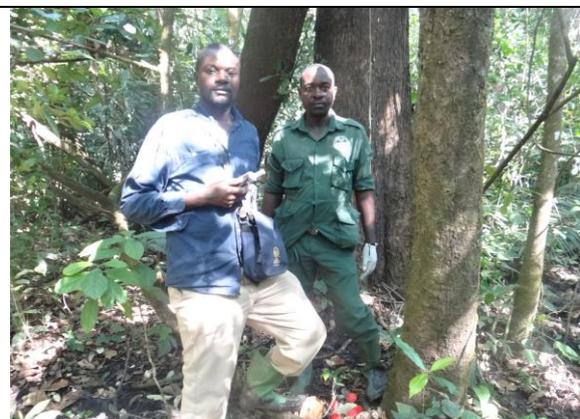


Figure 3: Survey team in the Masito-Ugalla Ecosystem (Left: Principal investigator: M. J. Kibaja; Right: Village Game Scout).



Figure 4: One of the survey teams (Right: Principal investigator M. J. Kibaja; Left: Village Game Scout, Tongwe Trust, Ntakata forest area) in the Masito-Ugalla Ecosystem.



Figure 5: Survey teams on the Ufipa plateau (Mbuzi forest, Chala forest and Ufipa escarpment).

Results

A total of 1407.6 km were walked in western Tanzania (77.9 km were walked in the Ufipa plateau and 1329.7 km in the Masito- Ugalla Ecosystem). At least 182 groups were found of which about 88% of all groups were in the Masito-Ugalla Ecosystem whereas 12% in the Mbuzi forest area (Ufipa plateau). New areas and sites harbouring this endangered primate were discovered. In the Mbuzi forest area, Rondokazi site is a newly surveyed site where Ashy monkeys were not seen (Figure 6).

Groups found varied in size from 2 to 102 individuals from all sites surveyed in western Tanzania. Overall mean group size in Mbuzi forest area was 51.3 and in Masito-Ugalla Ecosystem was 34.4 individuals (Figures 6 and 7). Groups were found in montane forest mosaic in Chala Forest (Figure 8) and in severely degraded montane forest patches in Mbuzi Forest. In the Ufipa escarpment 56.3% of the groups were found in narrow gallery forest and 43.7% in dense woodland (Figure 9). In the Masito-Ugalla Ecosystem 96.8% of groups were found in gallery forests whereas only 3.2% were found in dense woodlands. Intersite variations in group size may be due to differences in land protection status, the extent of human activities (cultivation) leading to population compression, fission-fission behaviours and inter-site habitat heterogeneity.

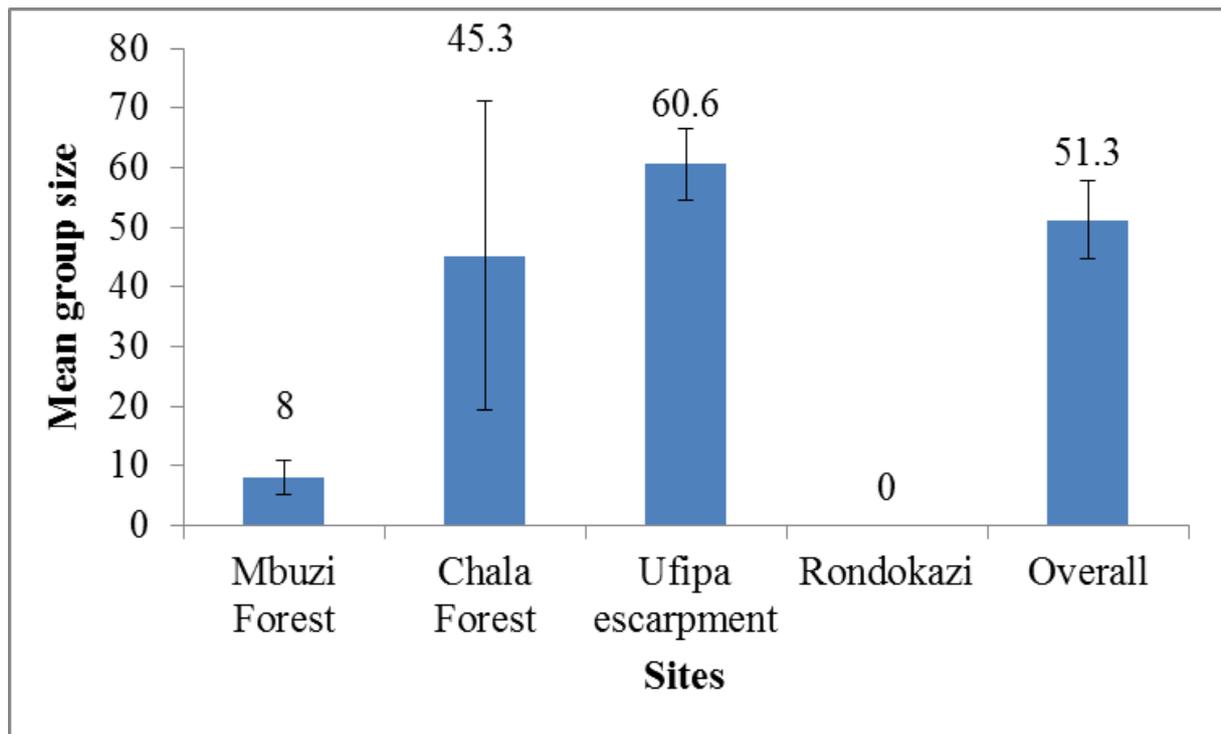


Figure 6: Mean group size of Ashy monkeys in surveyed sites in the Mbuzi forest area (Overall number of groups = 22).

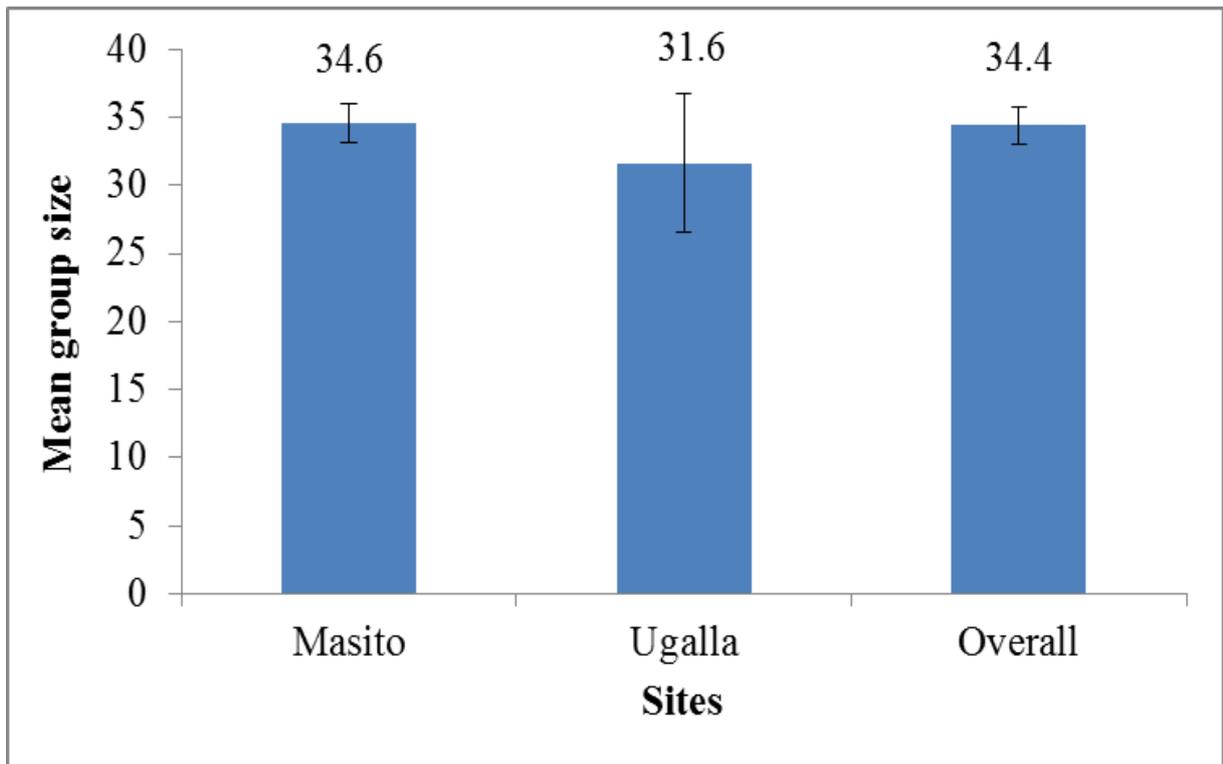


Figure 7: Mean group size of Ashy monkeys the Masito-Ugalla Ecosystem (Overall number of groups = 160).



Figure 8: Ashy monkeys in a forest fragment in Chala forest on the Ufipa plateau.



Figure 9: Ashy monkeys in a woodland habitat of the Ufipa escarpment on the Ufipa plateau.

Conservation threats

Influx of livestock keepers and bushfires are a common problem in all the study sites. In the Mbuluzi Forest area, a variety of human signs were observed, with the leading one being tree cutting (Table 1) followed by forest conversion into farms (Figures 10-11). Plots of marijuana (*Cannabis sativa*), which are illegal in Tanzania, were found in the Ufipa escarpment (Figure 12).

In the Masito-Ugalla Ecosystem the major human signs were sawing, farming, and poaching as the leading activities (Table 2 and Figure 13). The ecosystem has recently been invaded by cattle herders from other regions of Tanzania (Figure 14-15). Poaching is common in the entire ecosystem, though more severe in the proximity of village lands. Poaching is intensified by the presence of past refugee villages, situated at the centre of this ecosystem. Uncontrolled bushfires are also common. Beekeeping is the only environmentally friendly activity in the area (Table 2).



Figure 10: Harvested maize farm on the Mbuji Forest on the Ufipa plateau.



Figure 11: Harvested bean farm in the Mbuji Forest on the Ufipa plateau.



Figure 12: Plots of marijuana (*Cannabis sativa*) in the Ufipa escarpment (Principal investigator, M. J. Kibaja).



Figure 13: Rice farming along the Luegele river adjacent to Ntakata forest in the Masito-Ugalla Ecosystem.



Figure 14: Livestock grazing in Ngo'ndo area in the Masito-Ugalla Ecosystem.



Figure 15: Cowshed of cattle in the Ntakata forest area in the Masito-Ugalla Ecosystem.

Table 1: Encounter rates of human signs in the Mbuzi Forest Area.

	Human activity	Frequency	Encounters/km
1	Tree cutting	48	0.62
	Sawing pits	10	0.13
	Charcoal kilns	22	0.28
	Trees stumps	14	0.18
	Pole cutting	1	0.01
	Medicinal tree cuts	1	0.01
2	Livestock keeping	31	0.40
	Cowsheds	19	0.24
	Livestock keepers' huts	8	0.10
	Cattle herds	4	0.05
3	Farming	26	0.33
	Farms	25	0.32
	Local irrigation furrow	1	0.01
4	Poaching	18	0.23
	Traps	15	0.19
	Poachers camps	3	0.04
5	Bee keeping	2	0.03
	Beehives	2	0.03

Faecal samples

Ashy monkeys produce pellet-like faeces (Figure 16). About 1000 faecal samples have been collected from all sites in the Mbuzi forest area (100 samples) and Masito-Ugalla Ecosystem (600 samples). Samples have been kept in fridge at a -20 degrees centigrade at the University of Dar es Salaam.



Figure 16: Faecal pellets from Ashy monkeys in the Mbuzi forest area.

Table 2: Encounter rates of human signs in the Masito-Ugalla Ecosystem.

SN	Human activities signs	Masito area	Ugalla area	Masito-Ugalla Ecosystem
1	Beek keeping	0.120	0.215	0.159
	Beehives	0.120	0.215	0.159
2	Uncontrolled bushfires	0.076	0.270	0.155
	*Human mediated fires	0.076	0.270	0.155
3	Sawing/Lumbering	0.038	0.313	0.150
	Sawing pits	0.033	0.291	0.138
	Truck roads	0.001	0.013	0.006
	Sawing camps	0.001	0.007	0.004
	Timber plunk sites	0.003	0.000	0.002
	Trucks	0.000	0.002	0.001
4	Farming	0.214	0.039	0.143
	Farms	0.182	0.017	0.115
	Forest clearing	0.028	0.013	0.022
	Tree stumps	0.004	0.009	0.006
5	Poaching	0.067	0.050	0.060
	Human trails	0.029	0.031	0.030
	Traps	0.034	0.004	0.022
	Bushmeat drying sites	0.000	0.011	0.005
	Domestic dogs	0.004	0.000	0.002
	Gun powder making site	0.000	0.004	0.002
6	Livestok keeping	0.049	0.037	0.044
	*Cattle tramplings	0.129	0.322	0.208
	Cowsheds	0.011	0.024	0.017
	Cattle	0.023	0.007	0.017
	Pastoral huts	0.015	0.006	0.011
7	Other resource extraction	0.015	0.009	0.013
	Charcoal kilns	0.010	0.000	0.006
	Local honey collection	0.000	0.007	0.003
	Firewood collection	0.001	0.000	0.001
	Orchid harvesting sites	0.000	0.002	0.001
	Small holder dam	0.001	0.000	0.001
	Local alcohol brewing sites	0.001	0.000	0.001
	Mushroom harvesting	0.001	0.000	0.001

NOTE: Gunpowder making sites- Sites where local people made gunpowder (black powder) from certain rocks (probably sulfur rich rocks) using traditional methods. * = needs an appropriate method for quantification.

Conservation campaigns and action plan

A part of my funding from Rufford Foundation was spent for conservation campaigns of the species in the Masito-Ugalla Ecosystem and Mbuluzi Forest area. In both study areas conservation campaigns were conducted for different targeted groups:

villagers, elders, village and religious leaders, students and District Forestry officers regarding the conservation of Ashy monkeys and their habitats. Talks were given to Tanzania Forestry Services (TFS), Agency permit issuing officers of the Ministry of Natural Resources and Tourism in Dar es Salaam. Moreover, talks were given to Forestry, Fisheries, Wildlife and Natural Resources officers in the Sumbawanga, Nkasi and Mpanda Districts (Figure 17). Progress reports were given to Forest and TFS officers in Nkasi and Mpanda Districts. They contained information about the status and threats that Ashy monkeys face in their areas, and asked the respective Districts to take actions for the conservation of the monkeys. Lectures, excursions and poster displays were held to sensitize audiences (primary and secondary school students, villagers and village committees) in the following villages: Lwega, Lugonezi and Mwese in the Masito-Ugalla Ecosystem; and Chala A, Chala B, Swaila and Mfinga villages on the Ufipa plateau (Figures 18-24). Face to face interviews were held for farmers growing crops in the Mbuzi Forests. However, in the Mbuzi Forest, some farmers did not seem willing to devote their land (parts of the Mbuzi Forest converted into cropland) for any conservation intervention (e.g. the participatory community conservation).

One of the goals of my project was to produce a conservation action plan for Ashy monkeys in Mbuzi Forest. However, I have experienced a protracted progress regarding the generation of a species Conservation Action Plan in the Mbuzi forest. The major reason that caused its slow progress was that there was a major debate on the fact that currently the Mbuzi Forest is severely degraded. Up to 96% of its forest converted into farms and it also suffers from serious ongoing land use ownership conflicts such that people think it is of little conservation value. Thus the Conservation Action Plan has to be stopped until these conflicts are addressed. An immediate solution to this problem was to focus primarily on Chala forest, adjacent to Mbuzi Forest. Thus, the action plan is not complete. There has been however, an emerging concern that a new comprehensive action plan should be made to include the entire Mbuzi forest area in order to include the newly discovered sites harbouring this endangered primate. In the meantime, there has been an approved Conservation Action Plan globally which also addresses conservation actions for Tanzanian red colobus species (endorsed and inaugurated in the International Primatological Society Congress in August 2018 in Nairobi, Kenya). I am of the opinion that Ashy monkeys in the Mbuzi forest area should be given a serious conservation attention.



Figure 17. Principal investigator (middle) sensitizing forest, wildlife and natural resource officers in Sumbawanga District Council about the status of Ashy monkeys.



Figure 18. Talks with primary and secondary teachers and students in the Chala Secondary and Chalantai Primary Schools, Ufipa plateau. (Below)



Figure 19. Talks and contacts with villagers in the Chala Village, adjacent to Chala forest, Ufipa plateau.

Figure 20. Talks and poster displays in school teachers and village scouts, in Mwese ward, Masito-Ugalla Ecosystem.



Figure 21. Excursions to the Sitwe Forest fragment occupied by Ashy monkey in Mwese ward in the Masito-Ugalla Ecosystem.

Figure 22. Arrival in the Sitwe forest. Students, teachers and village committees watching Ashy monkeys in Mwese ward, Masito-Ugalla Ecosystem.



Figure 23. Delivering conservation education to primary school students in Mwese ward, Masito-Ugalla Ecosystem.

Figure 24. Delivering conservation education to primary school students in Chala village, Ufipa plateau

What is next?

There is still a need for more population surveys in the Masito-Ugalla Ecosystem. This is a very large landscape (above 10,872 km²) and most of its remote sites are hardly accessible, especially during the rainy season. Despite of outstanding findings (160 groups of Ashy monkeys), monthly line transect surveys for at least 6 or 12 consecutive months are recommended in the main vegetation types (gallery forest and dense woodland) in the ecosystem. This will compel me to re-apply for an extension grant in order to comprehensively and systematically survey this endangered primate in this unique savanna woodland habitat. I have presented some of my results in the XXVIIth Congress of the International Primatological Society (IPS) in August 2018 in Nairobi, Kenya. Two manuscripts are currently being written for publication.

Conclusion and recommendations

Conservation of the endangered Ashy red colobus in Tanzania, aside from the two National Parks of Gombe and Mahale, remains imperative. Anti-poaching activities should be intensified in the Ufipa escarpment and Chala Forest as well. The Masito-Ugalla ecosystem has remote large pristine forest patches which are promising for the survival of this primate. One of such forests is the Ntakata. I strongly recommend that this forest is upgraded into any form of strictly protected area in order to save its wildlife before it is too late. The Government should increase the number of wildlife rangers (forest guards) and village scouts in all Districts Councils in western Tanzania. Also, community conservation should be increased for endangered primates and other wildlife occupying village lands in the ecosystem. Intensification of anti-poaching activities in the Tongwe East Reserve in the Masito-Ugalla Ecosystem will be critical to save primates.

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