

UZUNGWA SCARP FOREST RESERVE IN CRISIS

An urgent call to protect one of Tanzania's most important forests



December 2010



CRITICAL | **ECOSYSTEM**
PARTNERSHIP FUND

ZSL
LIVING CONSERVATION



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Suggested citation: Rovero F., Mtui A., Kitegile A., Nielsen M., Jones T. 2010. Uzungwa Scarp Forest Reserve in Crisis. An urgent call to protect one of Tanzania's most important forests. Dar es Salaam, 2010.

Supported by Tanzania Forest Conservation Group, Wildlife Conservation Society – Tanzania Programme, Critical Ecosystem Partnership Fund, Zoological Society of London.

Printed in Dar es Salaam, December 2010

The printing of the report was funded by Italy's Museo Tridentino di Scienze Naturali with support from Tanzania Forest Conservation Group. The launch of the report was supported by the Tanzania Forest Conservation Group.

Front cover photos taken in Uzungwa Scarp Forest Reserve during 2003-2008 (by M. Menegon, M. Nielsen and F. Rovero)

REPORT SCOPE AND CONTENTS

This report has been compiled to highlight the significant losses in biodiversity documented in Uzungwa Scarp Forest Reserve (USFR) over the last few years, with evidence of a rapid increase in destruction, particularly over the last 2-3 years. If currently observed trends continue, local species extinctions are likely, especially for the endemic and flagship monkey, the Udzungwa red colobus, as well as the localized Angolan colobus and other forest mammals such as the duikers. The purpose of this report is to provide evidence of imminent population extinctions, drawn from three intensive studies, so that focused and effective actions to ensure protection of this forest can be carried out.

This report was presented to senior staff of the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism on July 27, 2010. The positive and encouraging comments which arose from this meeting have been incorporated in the report.

SUMMARY OF MOST CRITICAL RESULTS

1. Biodiversity research was focused on medium to large mammals (especially primates and ungulates) as they are excellent indicators of forest ecosystem integrity and include species targeted by hunting. Systematic monitoring of diurnal primates (the monkeys) from 2004 until the present day shows a significant decline in relative abundance of all species, with evidence of collapsing populations especially of colobus monkeys. Black and white colobus (*mbega mweusi*) were not observed in 2009 and the endemic Udzungwa red colobus (*mbega mwekundu*) have decreased rapidly.
2. Declining populations of duikers and other medium-sized forest mammals are confirmed from all three studies. Comparative data with other forests in the Udzungwa Mountains show that USFR has a very low abundance of both primates and duikers, including the Endangered Abbott's duiker. Use of snares is currently targeting smaller species because most of the larger ungulates and bushpig have already been hunted out. Without effective intervention, we can expect these species to follow the elephant, buffalo and leopard into extirpation from Uzungwa Scarp.
3. Systematic data collected along the same transects used for wildlife census also indicate clear increases in the incidence of logging, pole cutting, snaring, and other forms of disturbance.
4. Preliminary results from a detailed assessment of hunting practices suggest that hunting is the greatest threat to biodiversity in the forest. The study found that until about the mid 1990's hunting was intense and conducted for commercial purposes, while it subsequently shifted to hunting for local markets and household consumption. Although this change may have reduced the impact on wildlife, about 35% of households sampled currently consider subsistence hunting an important part of their livelihoods and an additional 15% rely on bushmeat as a gap-filler and security net.
5. The same study found that bushmeat hunting occurs in the Kilombero valley including in the lowland villages adjacent to USFR. Transport of this bushmeat through USFR to the villages on the plateau and beyond is undertaken. Forest species rarely appeared in these informal markets. This however does not imply that forest species are not hunted, as smaller species are often consumed directly in hunters' households rather than sold.

RECOMMENDATIONS

In order to reverse the trends reported here, it is recommended that increased protection of this Forest Reserve be implemented as a matter of urgency by the Tanzanian Government. In this regard, it is encouraging that FBD is currently "taking efforts to ensure sustainable forest management of the area; i) to upgrade Uzungwa Scarp Forest Reserve into Nature reserve and ii) to reserve Mngeta Corridor".

Short-term recommendations:

- A swift increase in law enforcement measures, including a greater budget allocation for forest patrols, as the most urgent priority is clearly to stop hunting;
- Provide training and support to adjacent communities to participate in the management and monitoring of the reserve, together with environmental education and awareness raising;
- Dialogue between the Forestry and Beekeeping Division and JKT in order to raise awareness on the importance of the portion of the forest which is managed by JKT, and to seek greater cooperation on forest management;
- Take prompt steps to upgrade the legal status to Nature Reserve.

Medium to long-term recommendations:

- Support livelihood alternatives to bushmeat in the communities around the reserve;
- Support tree planting amongst communities adjacent to the reserves;
- Protect the Mngeta corridor through expanding the Kilombero Nature Reserve to include this critical connectivity area and support community based forest management of adjacent areas;
- Provide environmental education and awareness raising to adjacent communities;
- Continue to monitor the status of the biodiversity and the threats to the USFR, including through the participation of adjacent communities.

Given that biodiversity loss is a global and pressing concern, we urge international donors to support this process, and to make a long-term commitment to supporting effective management of the forest under its improved status. Also desirable, as FBD intends to achieve, is the protection of the already identified and well-researched "Mngeta corridor", the only existing but rapidly vanishing area providing ecological connectivity between USFR and the Kilombero Nature Reserve. Finally, the stricter regulation that will be associated with increased protection will require investments into adjacent communities' livelihood alternatives to bushmeat hunting, timber tree cutting and extraction of other non- timber forest products. The report highlights that recent development projects such as distribution and loans for purchase of domestic animals, training on domestic animal rearing, woodlot establishment and environmental education are perceived to have decreased hunting effort. Finally, increased institutional collaboration between FBD, Tanzania National Parks, Wildlife Division and JKT will be critical to tackle the bushmeat trade and illegal logging.

ACKNOWLEDGEMENTS

The authors are grateful to the Forestry and Beekeeping Division of the Tanzanian Ministry of Natural Resources and Tourism for the important feedback given to an earlier version of this report, and for the commitment to take prompt steps to protect the Forest Reserve and its connectivity. The Tanzania Forest Conservation Group, and especially Charles Meshack and Nike Doggart, provided invaluable assistance, together with all other institutions and funding agencies referenced on the front cover. Thanks to A. Bowkett (University of Exeter) for verifying presence of Abbott's duiker through DNA analysis of dung.

BACKGROUND SUMMARY

The outstanding biodiversity importance of USFR has been well documented, especially for vertebrate species (Rovero and Menegon 2005). A recent updated analysis conducted for the candidature of selected Eastern Arc forests to the UNESCO's World Heritage Site indicated that USFR has the highest number (37) of threatened vertebrates in the Eastern Arc, according to the 2009 IUCN Red List (Ministry of Natural Resources and Tourism 2010). The number of Eastern Arc-endemic vertebrates is the second highest (31) of any Eastern Arc forest. However, there is long-standing evidence of illegal activities and degradation threatening this forest (Zilihona et al., 1998; Moyer & Mulungu, 2004; Museo Tridentino di Scienze Naturali 2007; Topp-Jørgensen et al., 2009).

At the first Udzungwa stakeholders' workshop held in Morogoro in 2004, within the framework of CEPF's investments in East Africa, USFR was identified as a priority site for conservation action in the region. Follow-up work conducted in 2006 confirmed the forest's poor conservation status and urgent need for greater protection (Museo Tridentino di Scienze Naturali 2007). The "Mngeta corridor" was identified as the only remaining chance to ensure connectivity between USFR and the northern network of protected areas (comprising Kilombero Nature Reserve, Udzungwa Mountains National Park and Nyanganje Forest Reserve; Museo Tridentino di Scienze Naturali, 2007; St. John, 2008). Despite the urgent need for action, USFR was not included in the newly formed Kilombero Nature Reserve (WWF-TPO 2007).

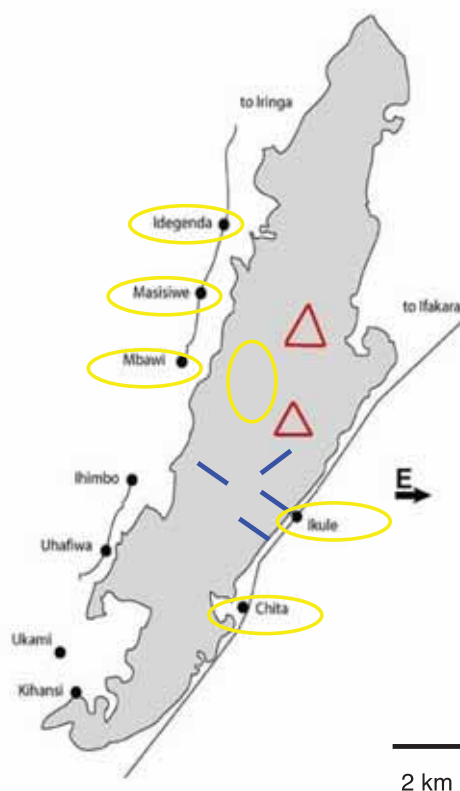


Figure 1. Map of Udzungwa Scarp Forest Reserve, with sites of the three studies, (1) blue lines: primate and antelope monitoring; (2) yellow circles: bushmeat hunting and duiker density studies; (3) red triangles: large mammal densities and disturbance. Bushmeat market interviews were conducted in Mngeta village

Unfortunately, encroachment and illegal activities have escalated since 2007. This has been confirmed both qualitatively from the increasing accounts of poaching events reported by and to

various researchers, and quantitatively through the following monitoring and research activities (study sites shown in Fig. 1):

- i) Primate and antelope monitoring conducted since 2004 to the present day (F. Rovero unpubl. data, Udzungwa Ecological Monitoring Centre 2009)
- ii) Studies of bushmeat hunting and duiker densities in the USFR and other Udzungwa forests 2001-2009 (M.R. Nielsen unpubl. data)
- iii) Comparative surveys of large mammal densities and levels of disturbance in USFR (2008) and other Udzungwa forests (2007-2009) (T. Jones, PhD thesis in prep.)

Fieldwork was focused in the central and north-central parts of the forest, which is where the largest areas of submontane and montane forest occur. The whole range of habitats and forest type found in the USFR are represented in the study sites; furthermore, opportunistic visits in southern areas (above Chita) and village interviews indicate that the situation reported from our study sites is representative of the whole Forest Reserve. The studies reported here were not aimed at a comprehensive inventory of biodiversity (which has been adequately summarized elsewhere including for the candidature to UNESCO's World Heritage Site), but rather at highlighting, through the most relevant information, the losses in critical biodiversity components.

In the next section we summarise the most relevant information from these three studies.

STUDY I. MONITORING OF FOREST MONKEYS AND DUIKERS: EVIDENCE OF COLLAPSING POPULATIONS

Primates and small forest antelopes have been monitored systematically through census walks in the forest (length of 3 to 4 km) repeated every month since 2004. Nearly 150 census walks totalling 530 km have been completed over three distinct periods between July 2004 and September 2009. Five transects have been used over the years, sampling the northern and mainly lower to mid-elevation portion of the forest (accessed from around Ikule village). Unfortunately, one transect called JKT, running inside the Military station located between Ikule and Chita, had to be discontinued in 2009. Results are reported in terms of relative abundance of the population monitored, expressed as the number of groups of monkeys or individual duikers sighted per km walked (Fig. 2).

The two colobus monkeys (*mbega*) and the red duiker (*funo*) are declining at significant rates, with the Angolan colobus *not reported* during the 25 censuses conducted throughout 2009. Similar though less conclusive declining trends are found for the other three species of primates: the Sanje mangabey (*ngolaga*), the Sykes' monkey (*kima*) and the yellow baboons (*nyani*).

Interpretation:

The overall trend of declining populations observed during the last 5 years is unambiguous, and the cause of this decline is very likely to be hunting. Records of hunters during censuses increased and comparative data with protected forests exclude habitat reasons and indicate hunting as the key factor in USFR (see below and Museo Tridentino di Scienze Naturali 2007, F. Rovero unpubl. data). Hunters with dogs drive the colobus monkeys to isolated trees and shoot them using mainly home-made shotguns. Duikers and other forest mammals that are too rare or nocturnal and therefore not detected from transects are taken using snares. Researchers have accumulated dozens of encounters with both practices (hunting of monkeys and snares) while on census or during various other surveys and research work, and these records have increased in frequency during 2009. Despite being more difficult to detect than the colobus monkeys, Sanje

mangabey and Sykes' seem to be less affected by disturbance in USFR, being much more elusive and reportedly more difficult to hunt.

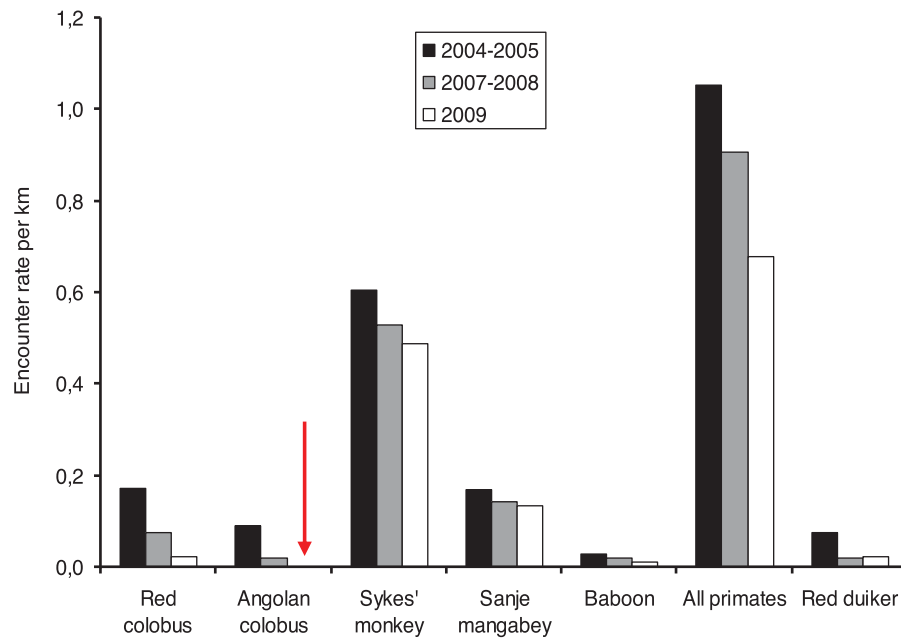


Figure 2. Relative abundances of populations monitored in USFR from 2004 till 2009. The greatest declines are seen in the Udzungwa red colobus, the Angolan colobus (that may be locally extinct, see **red arrow** pointing at the "0" recorded in 2009) and the red duiker, a commonly hunted forest antelope.

In addition to hunting, forest degradation also occurs through logging for timber and poles, charcoal making and firewood collection. Alteration of forest structure further impacts the canopy-dependent monkeys and more generally causes negative, irreversible changes in ecosystem health (Fig. 3).



Figure 3. Evidence of logging of timber trees (*Pterocarpus mildbraedii*) in the area managed by the Military Station (JKT). Photos taken in July 2004 at about 500 m of altitude along a trail parallel to the *Mkaja* river (also known as *JKT* river)

STUDY II. ASSESSING HUNTING EFFORT AND WILDLIFE ABUNDANCES IN USFR: EVIDENCE OF CONTINUED DISTURBANCE

Trends in hunting in USFR were assessed by conducting both wildlife and disturbance surveys using transects in the forest and community interviews in the villages. Villages involved were: Idagenda, Masisiwe and Mbawe (highland, western side of the forest) and Mngeta, Ikule and Chita (lowland, eastern side). In the highland villages, a detailed assessment on hunting practices was conducted in 2008, while in the lowland villages a bushmeat market survey was conducted during June 2008 to June 2009 to assess forest species' contribution to informal bushmeat markets in the Kilombero valley. Preliminary results are presented below.

1. Wildlife and disturbance transects

The wildlife and human disturbance survey was conducted in February 2008 (Nielsen, unpubl-1) in the northernmost area of USFR known as Kihanga, and repeated a survey conducted in February 1998 (Topp-Jørgensen et al., 2009). Two often-used trails running through the survey area leading from Mbawe and Masisiwe down to Ikule were used as the starting point for four transects. The survey recorded traps and signs of logging and pole cutting up to a perpendicular distance of five metres to either side of a 4.1 km-long transect. A density of 17.6 traps per km² was recorded in 1998 (Topp-Jørgensen et al., 2009) but in 2008 this had increased to 21 traps per km², equivalent to an increase in disturbance of 19%. However, most traps were found in association with or close to the main trail passing through the area. At least five gunshots were heard west of the survey area in 2008 which represents an increase compared to 1998, even though sample sizes are small. In addition, no primates were observed during three weeks' stay in the area in the same season. It was also observed that a large number of trees were cut to extract hyraxes from tree cavities.

The survey also recorded distance from transect to dung piles of duikers, to estimate relative densities. Results can be compared to data collected using similar methods in Ndundulu and Nyanbanitu forest within the Kilombero Nature Reserve (KNR; formerly West Kilombero Scarp Forest Reserve) and New Dabaga Ulangambi Forest Reserve (NDUFR) where Joint Forest Management (JFM) has been implemented. The results show that whilst wildlife populations in 2001 were highest in the lightly hunted WKSFR, intermediate in the medium hunted USFR and severely depleted in the heavily hunted NDUFR (Nielsen, 2006; Topp-Jørgensen et al., 2009) the situation now has changed so that USFR currently has the lowest densities of all three duiker species (Fig. 4; Nielsen, unpubl-1 and -2).

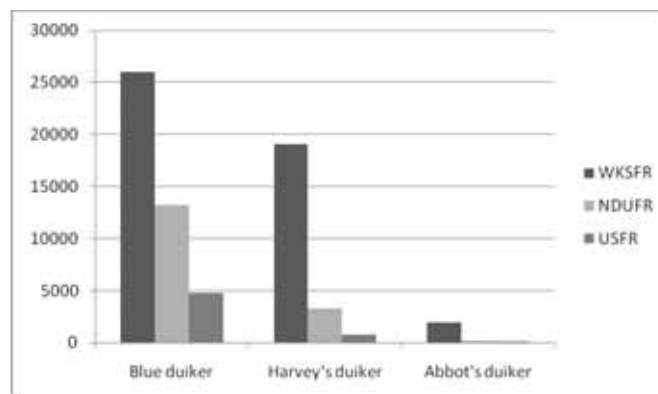


Figure 4. Density of duiker dung piles (number per km²) in WKSFR, NDUFR and USFR recorded in 2008 based on approximately 18, 11 and 4 km of transect, respectively.

2. Hunting practices in USFR

One hundred and ten community members of Masisiwe, Idagenda and Mbawe identified as knowledgeable about hunting in USFR were interviewed in 2008. This knowledge had been attained either through having actively hunted in USFR, or from being involved in transportation and trade in bushmeat. 91% mentioned bushmeat hunting – including the use of fire for hunting – as the current primary threat to the forest. Construction of the TAZARA railway was, however, considered the reason for local extinction of elephant in 1968, buffalo in 1972 and leopard in 1974 (although leopard was recorded in 2004). Respondents thought that hunting had been most intensive around 1965-70 when it was primarily conducted with rifles and using pitfalls. Observations in the forest support historical widespread use of pitfalls and that they are no longer used.

However, a substantial change in hunting has occurred since the mid 1990's, represented by a shift to hunting using snares for the purpose of local meat consumption, with limited trade within villages. Respondents reported that on average one to five persons from each village are currently hunting actively in USFR and that the change in methods and effort occurred due to increased law enforcement and environmental education. However the fact that all large mammals have been extirpated, and only very small populations of medium-sized mammals remain, was also emphasized. Respondents reported the perception that recent development projects such as distribution and loans for purchase of domestic animals, training on domestic animal rearing, woodlot establishment and environment education have decreased hunting effort. Overall, 60% did not find harvesting forest products including bushmeat important now, whereas 35% did consider it an important livelihoods activity. 15% of those that did not consider harvesting of NTFP important did however hunt and gather during times of crisis as a security net. This is higher than the number of active hunters reported, therefore caution is required in interpretation of the results.

3. Bushmeat market in the Kilombero valley

The community survey in the villages of Mngeta, Ikule and Chita indicated that bushmeat is traded in the Kilombero valley. Accordingly, bushmeat of lowland animals is still today transported from Ikule through USFR to the villages on the plateau and further on. However, forest dependent species rarely appeared in these informal markets. Specifically, only three Abbott's duiker, one Harvey's duiker and no primates were traded in the villages. Clearly, this does not mean that forest species are not hunted as smaller species often are consumed in hunters' households before reaching the market. It does, however, indicate that USFR is not targeted commercially which has important implications for approaches to address this problem.

Interpretation:

Bushmeat hunting is practised in the Kilombero valley. This has previously and may continue to drive a trade transporting bushmeat through USFR to villages on the plateau and further on. It is considered very likely that this situation promotes hunting by porters and people living adjacent to USFR on the Kilombero side. In addition, hunting inside USFR continues by some community members, while others may depend on hunting only at times of crisis. A current reported decline in domestic animals may thus explain the observed increase in traps in the forest and warrants further investigation.

The finding that wildlife densities in USFR are currently lower than in NDUFR, and most remaining larger mammal populations severely depleted, underlines and confirms the urgency of the current situation in USFR. The impressive recovery of species in NDUFR (Nielsen, unpubl-1) suggests that patrolling in USFR should be implemented. The indication that programmes to promote domestic

animal keeping, including short flexible loans, have reduced hunting argues for greater adoption of this strategy in relation to communities adjacent to USFR.

STUDY III. COMPARATIVE DENSITIES OF LARGE MAMMALS AND SIGNS OF DISTURBANCE IN USFR AND OTHER UDZUNGWA FORESTS

This third data set is drawn from systematic surveys of wildlife and disturbance signs conducted in USFR and several other Udzungwa forests between 2007-2009 (T. Jones, in prep.). We have selected Ndundulu for comparison with USFR for the following reasons: Ndundulu is approximately 60 km north-east of USFR, and spans 1300-2000 m in altitude (cf. USFR 300-2050 m, and note that densities of these mammal species may decrease with altitude; T. Jones, unpubl. data); comparable forest patch size (USFR 203 km² v Ndundulu 250 km²); each survey took place over 14-18 days each during the dry season of 2008 in dry and sunny conditions; Ndundulu was part of a Forest Reserve (WKSFR) under PFM from 2000 until its gazettment as part of the Kilombero Nature Reserve in 2007. Approximately 23 km of transects were walked and measured using a hipchain in each forest, across a range of altitude and distance from forest edge and villages (red triangles, Fig. 1), along which all mammal encounters, mammal signs, and signs of disturbance (cut trees, cut poles, snares, gunshots) were recorded. Results below are expressed as either number of dung piles encountered per km walked (Fig. 5), or number of primate groups seen from the transect per km (Fig. 7).

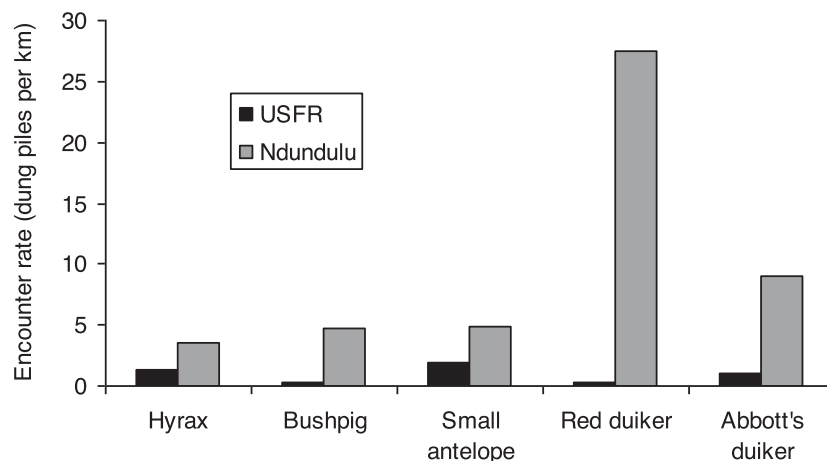


Figure 5. Wildlife relative abundances recorded in USFR and Ndundulu in 2008 through a third set of transects (T. Jones, unpubl. data).

The contrasting results between USFR and Ndundulu are unambiguous, and support the overall findings of the previous studies. Among all the medium to large mammal populations which are appropriately detectable by this method (Fig. 5), relative abundances in USFR are between 5-35% of those found in Ndundulu. The IUCN-Endangered Abbott's duiker is still present in USFR but in very low density, an important result given that USFR is one of only 6 forests where this Tanzanian endemic antelope is still found, having already been extirpated from many other Tanzanian forests over the last 50 years (Moyer, 2003); also considering that given the size of USFR, it has the potential to be a conservation stronghold for this important species.

The same very low relative density is also found for red duiker and bushpig, the two next largest species detected. Also found was a very high incidence of snares in the forest (1.13 snares per km, $n=26$), yet they were nearly all set for the giant pouched rat (with a few set for small antelope; figure 6). We assume that hunters using snares in USFR are now concentrating on smaller mammal species because the larger animals are almost gone. Three hunters' camps were found over the 14 days of transect walks.



Figure 6. Animals found caught in snares in USFR during 2008 survey: (a) blue duiker, and (b) giant pouched rat

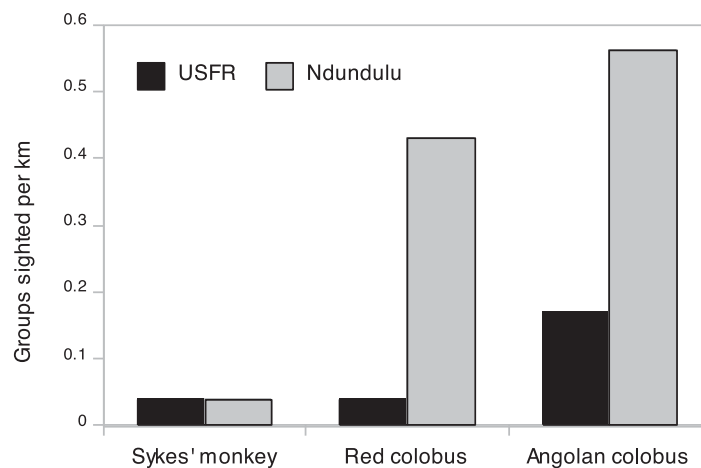


Figure 7. Sightings of primates in USFR and Ndundulu along transects during 2008 (T. Jones, unpubl. data)

This survey was carried out in a different area of the forest from the long-term primate monitoring (reported above, pages 5-6), but also found very low densities of primates (Fig. 7). These results being from 2008, Angolan colobus were present, but in both this species and the Udzungwa red colobus, surprisingly few encounters were made; Sykes' monkeys were also in low numbers, though this compares with the situation in Ndundulu too, so may be a function of

habitat. The colobines, however, are actively hunted; during this survey, hunters shooting at primate groups were heard on three occasions, most probably at either Udzungwa red colobus or Angolan colobus, according to our local ex-hunter guides. These species are targeted because of their response to disturbance: they do not flee very far but hide together in the top of a tree or trees, making it possible for a hunter to stealthily approach them and systematically shoot several members of the group.

CONCLUSIONS AND RECOMMENDATIONS

It is our hope that this report can solicit prompt intervention by the Government and the necessary support from the donor community. The stricter regulation that will be associated with increased protection will require investments into adjacent communities' livelihood alternatives to bushmeat hunting, timber tree cutting and extraction of other non- timber forest products.

Finally, the key recommendations listed in the opening of the report are here summarized:

1. Increase law enforcement measures, most urgently patrols to stop hunting;
2. Establish a dialogue between the Forestry and Beekeeping Division and JKT in order to seek greater cooperation on forest protection;
3. Provide training and support to adjacent communities to participate in the management and monitoring of the reserve, together with environmental education and awareness raising;
4. Take prompt steps to upgrade the legal status of the reserve to Nature Reserve;
5. Protect the Mngeta corridor through expanding the Kilombero Nature Reserve and support community based forest management of adjacent areas;
6. Continue to monitor the status of the biodiversity and the forest threats in USFR including through the participation of adjacent communities.

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