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Edited by Pritpal S. Soorae

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Zanzibar red colobus on Pemba Island, Tanzania: population status 38 years post-introduction

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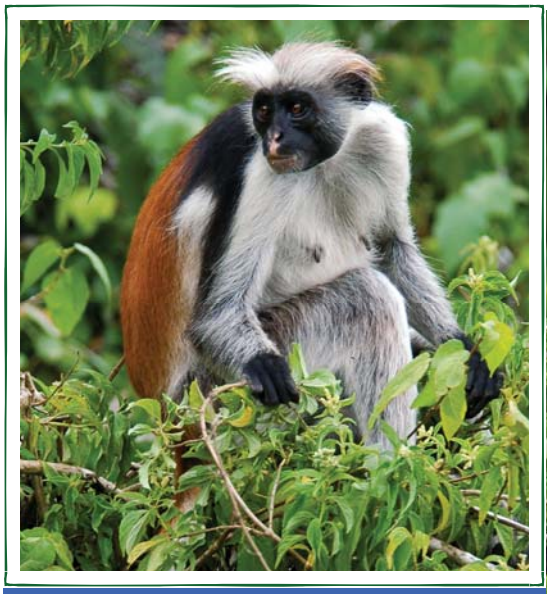
Introduction

The Zanzibar red colobus monkey (*Procolobus kirkii*; adult body weight c. 7 kg) is an arboreal, folivorous, forest monkey that is endemic to Zanzibar (Unguja) Island (2,461 km²), Tanzania. *Procolobus kirkii* is one of Africa's most threatened species of primate with but 2,000 - 2,500 individuals remaining (Struhsaker & Siex, 1998; Struhsaker, 2010). According to the current IUCN Red List of Threatened Animals, *P. kirkii* is an 'Endangered' species. *Procolobus kirkii* is also a CITES II species. About half of the *P. kirkii* on Zanzibar reside outside protected areas where they are threatened by habitat degradation, destruction, and fragmentation due to logging, charcoal production and clearing of forest for cultivation. There is no captive population.

Fifteen *P. kirkii* (5 males:10 females) were introduced in 1973 to Ngezi-Vumawimbi Nature Forest Reserve, north-western Pemba Island, Tanzania, by the Zanzibar Forestry Department (Maulid Hamad, pers. comm.). These animals were captured on Zanzibar, c. 150 km from Ngezi Forest. Pemba is an oceanic island located c. 50 km off the mainland. Prior to human occupation, Pemba was almost entirely covered with forest. Today, given the high density of people and intensive agriculture, only about 5% of the original forest remains. Nonetheless, Pemba continues to hold a rich and unique flora and fauna which includes many endemic and threatened species (Pakenham, 1984; Beentje, 1990; Nahonyo *et al.*, 2005).



Adult female Zanzibar red colobus monkey
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Goals

- Goal 1: This release occurred 38 years ago. We have not found any documentation as concerns

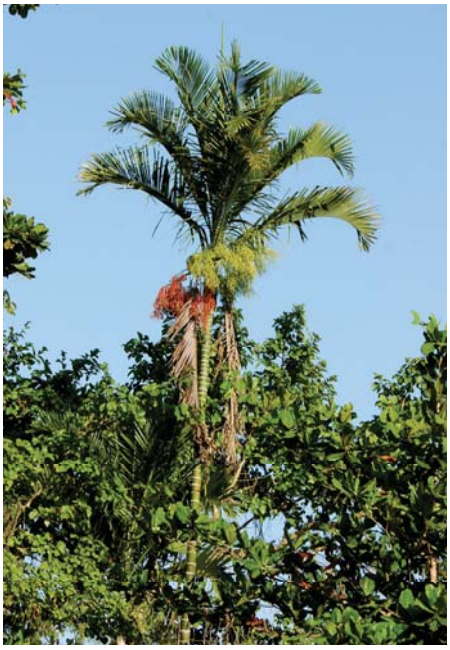
this introduction, and therefore, it is not known what 'success indicators' Forestry Department had in mind. We do know, however, that this was an introduction for the purpose of enhancing the long-term survival of *P. kirkii* and that this was followed in 1977 - 1978 by translocations (probably re-introductions) on Zanzibar itself, into Mayingini Forest Reserve (9 animals), Masingini Forest Reserve (23 animals), and Kichweli Forest Reserve (13 animals; Silkiluwasha, 1981). It seems obvious, therefore, that the primary goal was to establish a new, self-sustaining, population of *P. kirkii* on Pemba Island that would persist into the distant future and contribute significantly to the long-term survival of the species.

- Goal 2: A probable goal was to develop an efficient and inexpensive method for capturing and translocating *P. kirkii* while also minimizing mortality.
- Goal 3: A probable goal was to promote local, national and international awareness of the threats to the survival of *P. kirkii* and, thereby, influence public opinion and foster support not only for the conservation of *P. kirkii* but also for Ngezi-Vumawimbi Nature Forest Reserve and its biodiversity.
- Goal 4: A probable goal was to improve the image of the Zanzibar Forestry Department as a conservation body.

Success indicators

The pre-implementation success indicators are not known, but they, presumably, included the following:

- Indicator 1: The new population is self-sustaining and persistent (for centuries).
- Indicator 2: The new population increases in size so as to contribute significantly to the global population and conservation of *P. kirkii*.
- Indicator 3: Capture and translocation methods are developed that are practical, inexpensive, and that result in low mortality.
- Indicator 4: Public awareness of the plight of *P. kirkii* is raised on Zanzibar, Pemba, and internationally.



Pemba palm: an endemic species important for the survival of colobus

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Project Summary

Feasibility: Ngezi-Vumawimbi Nature Forest Reserve (20 km²), gazetted in 1923, encompasses the only moist forest (c. 10 km²) on Pemba that is of any size. Elevation is c. 0 - 30 m a.s.l. Soils are deep, rich, alluvial sands. The climate is hot and humid. Temperatures range from c. 21 - 34°C. Mean annual rainfall is c. 1,860 mm. The wettest months are March - May and November -

December. The moist forest of Ngezi has been described by Beentje (1990) as showing "…an assemblage of species that is not paralleled in any other East African forest…" and as "…unique in a global sense". Ngezi Forest is important for the conservation of at least six species of plants and 13 species of vertebrates that are endemic to Pemba Island, plus a good number of endemic subspecies and near endemic species, many of which are threatened with extinction (Pakenham, 1984; Beentje, 1990; Nahonyo *et al.*, 2005). It is not known what consideration, if any, was given to the impact that an introduced population of *P. kirkii* might have on the other (many) species in Ngezi Forest, or on the ecosystem as a whole. This monkey is not considered to be an important pest of crops.

The Tanzania Population Census of 2002 found 20,138 people in the 10 villages that are closest to Ngezi Forest. The annual rate of growth of this human population was 5.4% in 2002, which is one of the highest in Africa. Most of the land outside of the Ngezi-Vumawimbi Nature Forest Reserve has been cleared of forest and put under intensive agriculture (mainly cassava, sweet potato, coconut, millet, rice, and banana). Approximately 80% of the local income is derived from farming and 10% from fishing. About 59% of the people keep cattle and 30% keep goats. Many of the local people use the forest, particularly for firewood and timber (Nahonyo *et al.*, 2005).

Implementation: This represents one of the first attempts (if not the first attempt) to translocate or introduce an African primate for the purpose of conservation. No records were found of where on Zanzibar, or how, the *P. kirkii* translocated to Ngezi Forest were captured. As for all of the several captures made during 1977 - 1978, the site of the 1973 capture was probably either a poor habitat for *P. kirkii* or a good habitat that was being cleared for agriculture (Silkiluwasha, 1981). It is also likely that the capture method was the same as used during 1977 - 1978 for translocations within Zanzibar. See Silkiluwasha (1981) for details of the capture method and holding cages. Of 40 *P. kirkii* captured using this method in 1977 - 1978, four (10%) died prior to release.

There is no information on whether the *P. kirkii* captured on Zanzibar for release in Ngezi Forest were quarantined and/or given health checks, but this seems unlikely. On Zanzibar, *P. kirkii* were usually released on the same day that they were captured. *Procolobus* do poorly in captivity (Silkiluwasha, 1981; Struhsaker & Siex, 1998) so it seems unlikely that those bound for Ngezi Forest were held any longer than necessary prior to release. Whether they were moved to Pemba by air or by sea is not known. It is also not known how many, if any, died during the capture or translocation. Maulid Hamad (pers. comm.), who was present at the time of the release, said that all 15 *P. kirkii* were released at one site (Josh).

Post-release monitoring: There seems to be no information, prior to 1991, concerning post-release monitoring of *P. kirkii* in Ngezi Forest. Censuses of this population were conducted in 1991, 1992 (Struhsaker & Siex, 1998), 2000 (Ciani *et al.*, 2001), 2005 (Nahonyo *et al.*, 2005), and 2011 (this study). The 1991, 1992, 2000 and 2005 censuses each encountered no more than one group of *P. kirkii*

and the largest group comprised only six animals. Although the 2000 census located only one group of (at least three) *P. kirkii*, interviews with local people suggested that two other groups (of 5 - 8 and 5 - 7 animals) occurred in Ngezi Forest. A fourth group of 4 - 6 animals was said to be present in an abandoned clove plantation c. 6 km south of Ngezi Forest. The conclusion of the 2000 census is that there were 15 - 30 *P. kirkii* in Ngezi Forest.

During the 2011 census (5 days; 53 hrs of census by two primatologists) we located two groups (of at least 7 and 8 animals) and found strong evidence (leaves from which the petiole had been bitten-off) for three additional groups. We conclude that there are likely no fewer than 35 *P. kirkii* in Ngezi Forest, with the actual number perhaps closer to 40. There were no reports of *P. kirkii* at any other sites on Pemba. Thus, 38 years after the introduction to Pemba, the population has more than doubled, but continues to be small. The five groups were widely scattered across Ngezi Forest with the shortest distance between groups being 700 m and the farthest distance being 6 km. Groups appear to have an affinity for forest edge next to, or over, water (e.g., forest-mangrove ecotone, swamp forest).

Major difficulties faced

- Insufficient information: The absence of any monitoring during the first 17 years (1973 - 1990) post-release, and of a low level of monitoring over the past 21 years (1990 - 2011), greatly limits what can be learned from this introduction. For example, we do not know the rates of growth or decline of this population, nor the problems that this population encountered. A detailed census needs to be conducted of this population so that its size, age/sex composition, and distribution are better understood. Detailed censuses should then be repeated at least once every 5 years. Intensive ecological studies should be undertaken on this population with the objectives of better understanding what impact *P. kirkii* is having on the ecosystem and what factors are most limiting population growth. Genetics research (using fecal samples) needs to be conducted in order to assess the level of inbreeding and the need for translocating new animals into this population (see next bullet point). The genetic diversity of this population should be regularly monitored in order to assess the need for translocations.
- Probable inbreeding depression: Given the size of Ngezi Forest, and the high diversity of plant species, it seems unlikely that food is limiting this population. At present, *P. kirkii* probably occupy less than 10% of that part of Ngezi Forest that is covered by moist forest (c. 10 km^2). Now, 38 years (about four generations) post-release, this population (which is based on only 15 founders), may be suffering from inbreeding depression. If the present objective is to maintain the long-term viability of this isolated population, then at least one supplemental release of *P. kirkii* from Zanzibar is warranted as this should help to over-come what may be a genetic bottleneck. Individuals on Zanzibar that are likely to perish due to habitat loss are the most suitable candidates. The number to translocate, and the time frame, need to be determined, but even a small number might contribute significantly towards out -breeding the Ngezi Forest population.

Pemba vervet monkey is endemic to Pemba Island, Ngezi Forest © Yvonne de Jong & Tom Butynski

- Hunting: Poaching has been put forth as the reason for the low numbers of *P. kirkii* in Ngezi Forest (Nahonyo *et al.*, 2005). While we found no evidence of hunting during our census, the possible impact of hunting cannot be discounted, particularly given the small size of this population and that three of the larger species that are said to have once been common/ abundant in Ngezi Forest are now either at low density or, perhaps, extirpated; Pemba blue duiker (*Philantomba monticola pembae*), wild boar (*Sus scrofa*), and Zanzibar tree hyrax (*Dendrohyrax validus neumanni*) (Pakenham, 1984; Nahonyo *et al.*, 2005; T. Butynski & Y. de Jong, pers. obs.).
- Difficult to census: Unlike other populations of *Procolobus*, *P. kirkii* on Pemba are surprisingly difficult to locate and count. This is a relatively quiet, inactive, monkey that is often high and well-hidden in the canopy of tall trees (>30 m) or else low (<4 m) in extremely dense undergrowth on the forest edge. The high temperatures on Pemba mean that monkeys are typically inactive from 09:00 hrs - 17:00 hrs and that, when inactive, they are hidden in dense shade. Experienced field primatologists are required to lead the census teams (2 - 3 people), make group counts, and assess age/sex. The time required to fully census the population of *P. kirkii* in Ngezi Forest is estimated to be 20 - 28 census team days.
- Insufficient funding and expertise: The absence of monitoring of this introduced population of *P. kirkii* during the first 17 years post-release is attributable to the low budget and lack of relevant expertise in the Forestry Department. While the Forestry Department recognizes the importance of monitoring this population, and gave full administrative and staff support to the five censuses, most of the funds and expertise for these censuses came from several outside sources. The lack of a reliable source of dedicated funds for monitoring and research is expected to continue to be a serious constraint and risk for the management and long-term survival of this population.

Major lessons learned

- *Procolobus kirkii* can be successfully translocated: *Procolobus kirkii* can be successfully translocated and introduced. This has also been demonstrated at Masingini Forest Reserve (2 - 3 km²), Zanzibar. A total of 36 *P. kirkii* were translocated to Masingini Forest in 1977, 1978 and 1981. In 1994 this

population comprised c. 60 animals. This is a 67% increase during the 13 - 17 years post-introduction (Struhsaker & Siex, 1998). This population was still present in April 2011 (T. Butynski & Y. de Jong, pers. obs.).

- Suitable capture method exists: The method for capturing and translocating *P. kirkii*, as described by Silkiluwasha (1981) for the 1977 - 1978 translocations within Zanzibar, is effective, inexpensive, and mortality is low at about 10% (4 of 40 captured animals died). Whether mortality was similar for the Ngezi Forest introduction is not known but might have been higher given the greater distance (c. 150 km) between the capture site and the release site.
- Long-term monitoring scheme is required: Without a good post-release monitoring program in place, the opportunity to obtain information useful to improving the introduction process and post-introduction management of the population, and of assessing the impact of the introduced population on the ecosystem, is lost. A long-term monitoring scheme needs to be put into place.
- Enhance benefits to local people: More benefits to local people through eco-tourism in Ngezi Forest, perhaps with a focus on viewing *P. kirkii*, should bring additional conservation support from the local community and foster a sense of pride and responsibility for the conservation of Ngezi Forest, its biodiversity, and its population of *P. kirkii*.

Success of project

Highly Successful	**Successful**	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- The introduced *P. kirkii* were placed into what is probably a food-rich habitat; Ngezi Forest is larger and far more botanically-rich than any forest on Zanzibar. The altitude and climate (including rainfall) are similar on Pemba and Zanzibar.
- There are only two species of primate indigenous to Pemba and neither is a competitor with *P. kirkii*; Pemba vervet monkey (*Cercopithecus pygerythrus nesiotes*) and Zanzibar small-eared galago (*Otolemur garnettii garnettii*).
- There are no significant non-human predators of monkeys on Pemba, such as African crowned eagle (*Stephanoaetus coronatus*), robust chimpanzee (*Pan troglodytes*), leopard (*Panthera pardus*), or central African rock python (*Python sebae*).
- *Procolobus kirkii* is not known to be a serious pest of crops and the hunting of monkeys for bushmeat is not an important part of the culture of the people of Pemba, the vast majority of whom are Muslim (Muslims typically do not eat monkeys).
- There seems to be a steady increase in the local, national and international commitment to the conservation of Ngezi Forest and *P. kirkii*. Forestry Department, with support from outside agencies (e.g., CARE, FINNIDA) has continued to improve the protection and management of Ngezi Forest.

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References

Beentje, H. J. 1990. Botanical assessment of Ngezi Forest, Pemba. Unpublished report for the Zanzibar Forestry Development Project of FINNIDA and the Finnish National Board of Forestry.

Ciani, A. C., Palentini, L. & Finotto, E. 2001. Survival of a small translocated *Procolobus kirkii* population on Pemba Island. Animal Biodiversity and Conservation 24: 15 - 18.

Nahonyo, C. L., Mwasumbi, L. B., Msuya, C. A., Masao, C. A., Suya, T. B. & Shing'wenda, C. 2005. Ngezi–Vumawimbi Forest Reserves biodiversity inventory report. Unpublished report for Care Tanzania and Department of Commercial Crops, Fruits and Forestry.

Pakenham, R. H. W. 1984. The mammals of Zanzibar and Pemba Islands. Unpublished report, Harpenden, Herts, England.

Silkiluwasha, F. 1981. The distribution and conservation status of the Zanzibar red colobus. African Journal of Ecology 19: 187 - 194.

Struhsaker, T. T. 2010. The Red Colobus Monkeys. Oxford University Press, Oxford. pp. 349.

Struhsaker, T. T. & Siex, K. S. 1998. Translocation and introduction of the Zanzibar red colobus monkey: success and failure with an endangered island endemic. Oryx 32: 277 - 284.