



Red colobus (*Piliocolobus*) conservation action plan 2021-2026

Joshua M. Linder, Drew T. Cronin, Nelson Ting, Ekwoge E. Abwe, Tim R.B. Davenport, Kate M. Detwiler, Gérard Galat, Anh Galat-Luong, John A. Hart, Rachel A. Ikemeh, Stanislaus M. Kivai, Inza Koné, Deo Kujirakwinja, Fiona Maisels, W. Scott McGraw, John F. Oates, and Thomas T. Struhsaker



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Piliocolobus badius temminckii. © Russell A. Mittermeier

FOREWORD

Russell A. Mittermeier, Chief Conservation Officer, Re:wild, and Chair, IUCN SSC Primate Specialist Group

The origins of this *Red colobus conservation action plan* go back to the early days of organised primate conservation efforts, and I think it informative to summarize them here. The first mention of red colobus conservation in an action plan was in the 1977 *Global Strategy for Primate Conservation* (Mittermeier, 1977), which provided the first ever worldwide overview of primate conservation needs. In this strategy, red colobus were included in seven projects: three of Highest Priority, including the forests of Upper Guinea (Republic of Guinea, Sierra Leone, Liberia and Côte d'Ivoire) and the creation of national forests in Cameroon (both written by the late Stephen Gartlan), and one for the conservation of primates in rain-forest relics in the East African countries of Kenya, Tanzania, and Uganda (written by Thomas Struhsaker); two High Priority projects covering the Congo Basin in what was then Zaïre (now Democratic Republic of Congo); and two Priority projects, the "Conservation of Primates in Senegal" and "Primate Conservation in the Ankasa Area of Ghana". Later that same year, this early strategy led to the creation of a primate program at World Wildlife Fund – U.S. and the first ever primate action fund for rapid, small-grant project support.

Even before this strategy, Thomas Struhsaker was highlighting the fact that the rain forests of Africa were largely overlooked. In a paper entitled "Rain-forest conservation in Africa", published in the journal *Primates* in 1972 (Struhsaker, 1972), he goes into detail on what was already becoming a crisis. Even though he did not single out red colobus, he did highlight several key sites, including the Taï Forest in Côte d'Ivoire, and Korup in Cameroon, and Kibale in Uganda, all of them with populations of different taxa of red colobus. Three years later, Struhsaker (1975) published his classic monograph entitled *The Red Colobus Monkey*, based on his studies of *Piliocolobus tephrosceles* in Kibale Forest in Uganda. Although not focused on conservation, this book includes a brief section on habitat destruction and conservation in which he mentions that red colobus in countries like Côte d'Ivoire and Cameroon were already on the decline, that these monkeys appear to be dependent on large areas of mature rain forest, and that if protected they could eventually become a tourist attraction.

Three years on after the appearance of the Global Strategy, in 1981, John Oates, Thomas Struhsaker, Stephen Gartlan and I met at Rockefeller University in New York to talk about it. We discussed the need for a more "strategic" approach, based on a study of primate distribution patterns that John Oates had begun to undertake and also on Thomas Struhsaker's thoughts concerning priority sites, as discussed in his above-mentioned 1972 paper. All of this resulted in an article in the first newsletter of the International Primatological Society (IPS) in 1982 (Stephen Gartlan was then IPS Vice-President for Conservation), which outlined a framework for African primate conservation (Oates et al., 1982).

Four years later, building on the framework outlined by Oates, Struhsaker and Gartlan in that 1982 paper, Oates compiled the very first of the modern action plans produced by the Species Survival Commission (SSC) of IUCN, the *Action Plan for African Primate Conservation, 1986-1990* (Oates, 1986). <https://portals.iucn.org/library/node/5795> In it, he discussed five taxa of red colobus as among the most threatened primates in Africa. This same information was published again in our book, *Primate Conservation in the Tropical Rain Forest* (eds. C. W. Marsh and R. A. Mittermeier), in 1987, in a chapter entitled "A framework for African rain forest primate conservation" (Oates et al., 1987), and then again in the IUCN Conservation Monitoring Centre publication entitled *Threatened Primates of Africa: The IUCN Red Data Book* (eds. P. C. Lee, J. Thornback and E. L. Bennett) (Oates, 1988). <https://portals.iucn.org/library/node/5876>

Ten years after that first African primate action plan, John Oates again led the way with the first-ever follow-up action plan produced by the SSC, *African Primates: Status Survey and Conservation Action Plan (Revised edition)*. <https://doi.org/10.2305/IUCN.CH.1996.SSC-AP.4.en> In it, he again featured red colobus monkeys and specifically stated in his Executive Summary that: "Given the large number of highly localized and threatened populations of red colobus monkeys it is recommended that a Red Colobus Conservation Action Plan be prepared and implemented" (Oates, 1996, p.vi).

In the interim, a lot of field work was conducted on several red colobus species, and one paper stated that Miss Waldron's red colobus (*P. waldroni*) from Côte d'Ivoire and Ghana was probably already extinct (Oates et al., 2000). This was a major wake-up call for the primate conservation community since we had not lost a single primate taxon in the 20th century. The subsequent discovery of the skin of a recently killed red colobus from the Tanoé Forest in Côte

d'Ivoire (McGraw and Oates, 2002; McGraw, 2005) called this into question, but there is no doubt that this species, if it still exists, is in dire straits. Interestingly, as early as 1956, Angus Booth predicted the eventual extinction of red colobus in Ghana.

In 2005, the idea of a red colobus action plan emerged again, this time at the African Primate Red-Listing Workshop held from 26–31 January at Disney's Animal Kingdom in Orlando, Florida, part of a Global Mammal Assessment carried out by IUCN in the latter part of that decade. At that time, there was considerable discussion of the critical situation of many red colobus species, Thomas Struhsaker and others stressed the need for an action plan. A few months later Struhsaker published a paper entitled "Conservation of red colobus and their habitats", which highlighted the urgency of the situation for many red colobus species (Struhsaker, 2005).

Five years later after the Orlando workshop and 35 years after his first book on red colobus, Thomas Struhsaker published another landmark volume on these monkeys. Entitled *The Red Colobus Monkeys* (Struhsaker, 2010), it includes an entire detailed chapter dedicated to red colobus conservation. Although not labelled as such, it was *de facto* an action plan.

Seven years later, at the 2012 IPS Congress in Cancun, Mexico, discussions were held about the creation of an Africa-wide primatological organization. Following up on those discussions, David Mbora (involved for many years with the conservation of the Tana River red colobus) took the lead in planning such an organization via an African Primate Working Group (APWG). Further meetings were held at the August 2014 IPS Congress in Hanoi, and these in turn led to a workshop in Cape Town, South Africa on July 12, 2015, again led by David Mbora and including Inza Koné, Denis Ndeloh-Etiendem, Riashna Sithaldeen, four members of the Primate Ecology and Genetics Group, South Africa, and Sian Waters via Skype. This meeting, which was funded by the Primate Action Fund, Primate Conservation, Inc., and the Arcus Foundation, produced a series of recommendations, one of which was to use the IUCN Red-listing Workshop planned for 2016 to finalize plans for the creation of an African society.

Little happened in the nine months that followed, but, as hoped for in the Cape Town meeting, the IUCN African Primate Red-listing Workshop, held in Rome, April 18-23, 2016, proved finally to be catalytic. This important event included a large delegation of African primatologists led by Inza Koné from Côte d'Ivoire, Rachel Ashegbofe Ikemeh from Nigeria, and Denis Ndeloh-Etiendem from Cameroon, as well as some of the most senior expatriate specialists on African primates, among them Thomas Butynski, John Hart, Jonathan Kingdon, John Oates and Thomas Struhsaker. On the last day, a special meeting was held to push forward the concept of an African Primatological Society, and this discussion continued into the dinner that night.

Of particular relevance to this action plan, the Rome Workshop again highlighted the serious situation of the red colobus monkeys, and the need to develop an action plan for them once again emerged as a top priority.

Shortly thereafter, at the XXVI International Primatological Society Congress in Chicago, Illinois, USA, in August 2016, there was a follow-up meeting about creating an African Primatological Society, led by Inza Koné and Rachel Ashegbofe Ikemeh, and about the need to finally take the steps necessary to write a red colobus action plan. Several of the authors of this document, notably Joshua Linder, Nelson Ting, Drew Cronin, and Inza Koné, agreed to take on this challenge.

Less than a year later, July 24–26, 2017, we held the First Congress of the African Primatological Society in Bingerville, Côte d'Ivoire, hosted by Inza Koné (Imong et al., 2016). The turnout was amazing and surprised even the most optimistic of us, with more than 150 participants, at least 90% of them from 22 African countries. Elections were held, and Inza Koné was elected President, Gladys Kalema-Zikusoka (Uganda), Vice President, Ekwoke Enang Abwe (Cameroon), Secretary General, and Riashna Sithaldeen (South Africa), Communications Secretary.

Of particular relevance to red colobus conservation, we took an entire day (July 27) immediately after the congress to hold a Red Colobus Action Plan Workshop, with many experts, mainly from Africa, contributing to what they thought necessary to structure the plan and ensure the survival of these animals. The process was now finally underway, and the writing began in earnest. At this congress, we also saw the emergence of Florence Aghomo from Cameroon as one of the young leaders of African primatology.

The result was that red colobus conservation was a major feature of the XXVII Congress of the International Primatological Society in Nairobi, 19–25 August 2018. We held four events dedicated to red colobus, with Drew



Participants in the 2016 IUCN African Primate Red-Listing Workshop in Rome, Italy. © Russell A. Mittermeier



Participants in the Red Colobus Action Plan Workshop at the Inaugural Congress of the African Primatological Society in Abidjan, Côte d'Ivoire. © Drew T. Cronin

Cronin from the Wildlife Conservation Society and the Bioko Biodiversity Protection Program (Equatorial Guinea), Nelson Ting from the University of Oregon, Joshua Linder from James Madison University in Virginia, Barney Long from Re:wild (formerly known as GWC), William Konstant from the Margot Marsh Biodiversity Foundation, and Rachel Ashegbofe Ikemeh playing important roles in their organization. The first was a Symposium entitled, “The Red Colobus Conservation Action Plan: Catalyzing Range-wide Conservation Efforts”, which looked at the conservation status and ecology of the entire genus. It was very well-attended with 80 people present, including a large contingent of young African conservationists working on red colobus across their range. Next there was a workshop entitled “The Red Colobus Conservation Action Plan: Taking Stock and Planning Strategic Next Actions”, focused on next steps, range-wide initiatives, and a discussion of how we can work together as a conservation community. This also had excellent participation with 75 people joining. We then had an evening launch event of the Red Colobus Conservation Action Plan with more than 100 people present and with presentations by Inza Koné President of the African Primatological Society, by Hasting Ozwara, the Director of the Kenyan Institute of Primate Research, by Ekwoge Enang Abwe, Secretary-General of the African Primatological Society, and from me as Chair of the Primate Specialist Group, as well as a video message from Jane Goodall on the importance of red colobus conservation. Discussions continued well into the night, helping to further build bonds within the community of red colobus conservationists. To cap it all off, we had a two-hour leadership meeting on the action plan, looking at how we could turn the plan into concrete action.

Among the decisions taken at the Nairobi congress was the need to set up both a Red Colobus Conservation Network (along the lines of the Lemur Conservation Network) and a Red Colobus Working Group, a joint initiative of the Primate Specialist Group and the African Primatological Society. This working group was set up to guide a network coordinator, whose job would be to drive the implementation of the action plan, so that it would have a team behind it to make sure it results in action. A few months later, on June 10, 2019, Florence Aghomo was selected as the Red Colobus Conservation Coordinator to lead both the network and the working group. The group has held regular meetings since then.

The following year, we again held two sessions on red colobus at the Second Congress of the African Primatological Society in Entebbe, Uganda, 2–6 September 2019, hosted by Gladys Kalema-Zikusoka of the NGO Conservation through Public Health. One of these was a two-day working session on the development of a monitoring and evaluation system for both the Red Colobus Conservation Network and the Action Plan, and the other was a plenary presentation on the Action Plan. Florence Aghomo led the discussions, and several of the other authors of this action plan were also active at the Congress. Immediately after the congress, in collaboration with National Geographic, we ran a day-long training session on fund-raising for up-and-coming red colobus conservationists. This highly successful congress was attended by more than 300 people, including large delegations from Cameroon and Nigeria.

It is also worth noting how taxonomy can complicate conservation efforts, a point raised by Oates and Ting in 2015 in a book celebrating 50 years of the career of Colin Groves, whose review of the colobus monkeys in 2007 gave us the baseline for understanding their diversity, and as such the wherewithal for drawing up this plan. There have been many changes in red colobus taxonomy over the years, ranging from all taxa once being considered subspecies of a single wide-ranging species to the current arrangement of 17 species and 18 taxa, with numerous variations along the way (Groves, 2007). Even today, however, the status of several taxa from the eastern DRC such as *lulindicus*, *langi*, and *semlikiensis* remains unresolved.

What is more, the process of Red-Listing can also be very complex and time-consuming. This became very clear at the workshop in Rome in 2016, and in the follow-up efforts to finalize the Red List assessments for these species. Liz Williamson, one of the Primate Specialist Group’s Red List Coordinators, estimates that she alone had more than 1,100 back and forth email communications on red colobus alone after the Rome workshop in order to arrive at the final assessments shared in this action plan. And many others were involved.

Now, at long last and thanks to the outstanding efforts of the authors, we finally have a full-blown red colobus action plan, which we are very pleased to present here. However, we should point out that we have not waited for publication of this plan to begin fund-raising for red colobus and have since 2018 already succeeded in raising more than US\$ 866,000 for red colobus projects, many of which have been providing additional information to consolidate the action plan. Of course, this is only a small amount compared to the needs identified here, but it is a start. We hope that this outstanding document will help to find much more in the way of resources, to stimulate further interest in red colobus conservation, and to establish these monkeys as one of the most important flagships for forest conservation in Africa.

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EXECUTIVE SUMMARY

Ranging from forests in Senegal to the Zanzibar Archipelago, red colobus monkeys (*Ptilocolobus* spp.) are the most threatened group of African monkeys. According to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species™ in 2020, every form of red colobus monkey is threatened with extinction, and 14 of the 18 taxa (>75%) are listed as Critically Endangered or Endangered. Despite their conservation status, only a few populations have been studied in any detail and the general public is largely unaware of these monkeys and their plight.

Following over two decades of calls to prioritize red colobus conservation efforts, this document finally brings together the knowledge of experts on these monkeys and African wildlife conservation to identify the populations in most urgent need of conservation and to develop priority conservation actions for each taxon and across the red colobus' geographic range.

The primary proximate threats driving red colobus population declines are hunting and habitat loss, which are ultimately being driven by a combination of human population growth, worldwide demand for natural resources, and an increasingly globalized economy. Seventeen of the 18 red colobus forms are threatened by illegal hunting, especially to supply the commercial bushmeat trade. Red colobus monkeys are among the primate species most vulnerable to hunting due to their large size (which makes them a preferred target, providing more meat per unit effort than smaller species) and behaviours that are poor defences against human hunting techniques. They are typically the first primates to be extirpated from any given area because of these two factors. Logging, agricultural expansion, charcoal production, mining, and infrastructure development are the main drivers of habitat loss, and one or more of these factors affect nearly all red colobus species. For many taxa, especially those in West and Central Africa, the expansion of extractive industries and large-scale industrial agriculture is putting increasing pressure on red colobus habitats and exacerbating bushmeat hunting and trade. Focusing conservation efforts on red colobus monkeys will also help to protect habitats for animal species that are also threatened by these human activities.

Range-wide and taxon-specific conservation actions are centred around seven main strategies that aim to prevent red colobus extinctions and improve their conservation outlook. First, 16 of the 18 red colobus forms urgently require field surveys and monitoring to assess their distribution, abundance, and the threats they face. The success of most other conservation actions depends on this most basic of information. Second, protected areas and their buffer zones (government and community managed) are critical to the future of red colobus and their habitats. Creating new protected areas and improving the effectiveness of current ones are among the top priorities for all red colobus taxa. Third, engaging and collaborating with local communities living close to red colobus monkeys and integrating these communities into wildlife conservation initiatives is a top priority, especially since many red colobus populations occur outside protected areas. The fourth strategy is to develop partnerships between conservation and public health organizations to address issues of human health and family planning in and around red colobus habitats. Fifth, for most of the red colobus forms, implementation of local and global education and awareness programmes focused on red colobus and their habitats is identified as a priority action. Sixth, the formation of a global network of red colobus researchers and conservation practitioners will help to develop and coordinate conservation interventions. Finally, the actions described in this plan are more likely to be effective if they are supported by governments of the 18 countries where red colobus monkeys live.

Conservation priorities and their estimated costs were also identified for each taxon. Costs were estimated for smaller-scale actions (e.g. surveys, education and outreach), which totalled c. US\$ 2.44 million over the five year period (2021–2026). Costs were not estimated for long-term or recurrent recommended actions that require considerable investment from the governments of red colobus range countries and that are typically associated with government spending (e.g. protected area gazettement and management). These additional costs would likely exceed US\$ 17 million across all red colobus taxa over five years.

We hope that this plan will lead to increased funding for the recommended priority actions outlined in this plan and improved conservation status of red colobus populations. It is very clear that if current trends continue, failure to act will result in red colobus extinctions in the coming decades.

ACKNOWLEDGEMENTS

We are grateful to the many people who have contributed directly to this Red colobus conservation action plan (they are listed on pp. 62–63), and for the invaluable contributions of so many individuals living and working in red colobus range countries (governmental officials, community members, educators, rangers, managers, policy makers, and others), who have contributed to the conservation of red colobus and their habitats for so many years.

We thank all who participated in the workshops and symposia associated with this action plan, including: Laurie Alapini, Emmanuel Bassey, Anderson Bitty, Genevieve Campbell, Moses Chemurot, Edward Wiafe, Rebecca Goldstone, Reiko Matsuda Goodwin, Mariano Houngbédji, Sami Blaise Kambire, Amani Kitegile, Amani Salum Kitegile, Kwadwo Mensah, Ahmim Mourad, Magnant Mukulumanya Mubonge, Urbain Ngobobo Ibungu, Paul N’Goran, Jacob Oluwafemi Orimaye, David Osei, Soiret Serge Pacome, Tenekwetché Sop, Michael Stern, Tsoumbou Thierry, Armand Didié Zadou, and Omobayo Ghislain Zoffoun.

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Finally, the primary editors (JL, DC and NT) wish to highlight the lifelong contributions of Thomas Struhsaker and John Oates for bringing the plight of red colobus monkeys to the attention of scientists, conservation organizations, and national governments. This plan is founded on their knowledge of, experience with, and dedication to red colobus monkeys and their conservation.



Piliocolbus pennantii. © Ian Nichols

INTRODUCTION

Taxonomy

There are three main kinds of colobus monkeys living in the forests of Africa: the red, olive, and black-and-white colobus. At present, these three groups are usually placed in three separate genera: *Piliocolobus*, *Procolobus* and *Colobus*, respectively. This plan focuses on the genus *Piliocolobus* – the red colobus. Below the genus level, most taxonomists organize all red colobus into 16–18 distinct taxa, which may also be referred to as “forms”, based largely on variation in coat-colours and patterns. Which of these forms should be afforded species status as opposed to subspecies status has caused the number of recognized species to fluctuate between one and 17.^{1,2} The result is that there is currently no universal agreement upon how many red colobus species exist. Taxonomic uncertainty is especially high for the red colobus forms in the eastern Democratic Republic of Congo (hereafter DRC), where an area of hybridization likely occurs among a number of red colobus forms (see ‘Hybrid Zone’, Figure 1). To avoid further confusion, this plan uses the classification generated by the Primate Specialist Group of the IUCN Species Survival Commission (SSC), which follows the classifications of Groves³ and Zinner et al.⁴, and which is followed by the IUCN Red List of Threatened Species™. This plan, therefore, highlights the conservation status and needs for 17 red colobus species, with one species (*Piliocolobus badius*) divided into two subspecies, resulting in 18 distinct forms (Figure 2). As red colobus have been diversifying in Africa for at least 3 million years⁵, the 18 forms have come to differ from one another in aspects of coat colour and pattern, facial appearance, behaviour, size, genetics, and vocalizations.

Distribution

Red colobus monkeys are found only in sub-Saharan Africa, ranging from Senegal in the west to the Zanzibar Archipelago in the east (Figure 1, Table 1). Despite a distribution that spans the entire continent, red colobus are strikingly absent from large blocks of forest, including all of Gabon and most of Nigeria, Equatorial Guinea, Cameroon, and Republic of Congo (hereafter Congo). These monkeys inhabit a diversity of forests, including rainforest, riparian forest, mangrove swamp, and dry savanna woodland, ranging in altitude from sea level to 2,600 m above sea level.

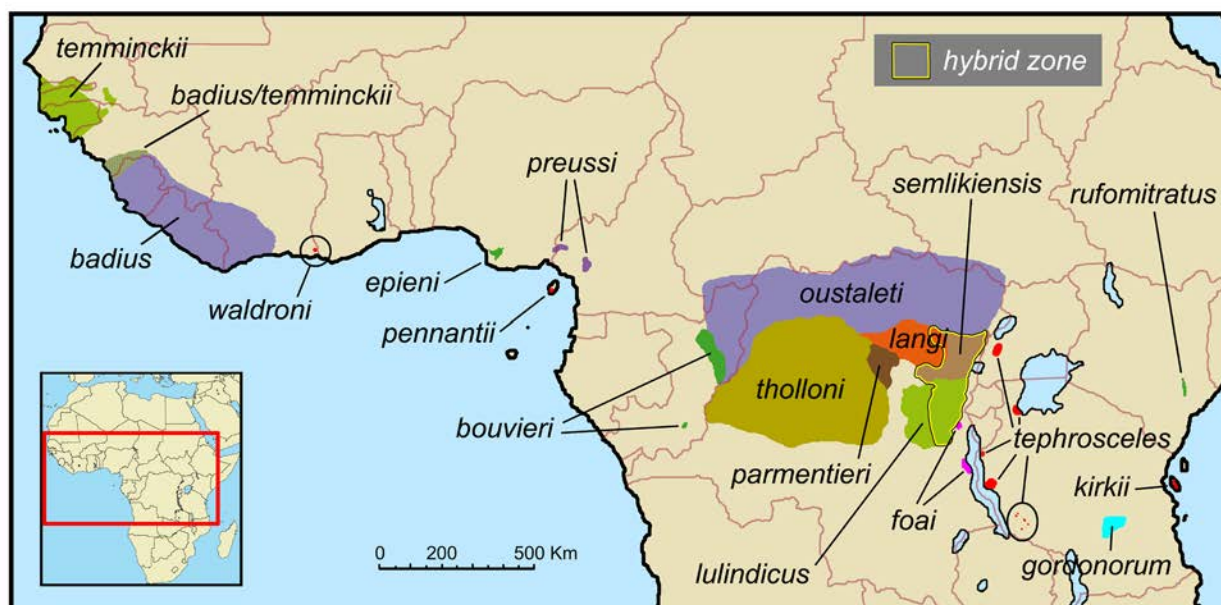


Figure 1. Red colobus distribution. Map by Stephen D. Nash

Anatomy and behavioural ecology

As with the other colobus monkeys, red colobus monkeys have thumbs that are greatly reduced in size and a large, multi-chambered stomach that allows them to feed on difficult-to-digest foods, especially leaves and seeds.⁶ Their relatively long tails and hind feet facilitate long distance leaps between trees. Most of the information on red colobus behavioural ecology comes from detailed studies of only a handful of taxa. These studies indicate that although there is considerable ecological and social variability among red colobus forms, most live in large, multi-male, multi-female groups, in which females typically outnumber males, and group members spend most of their day feeding or resting.⁷ They are frequently found in association with other monkeys, partly as a means to reduce predation pressure.⁸

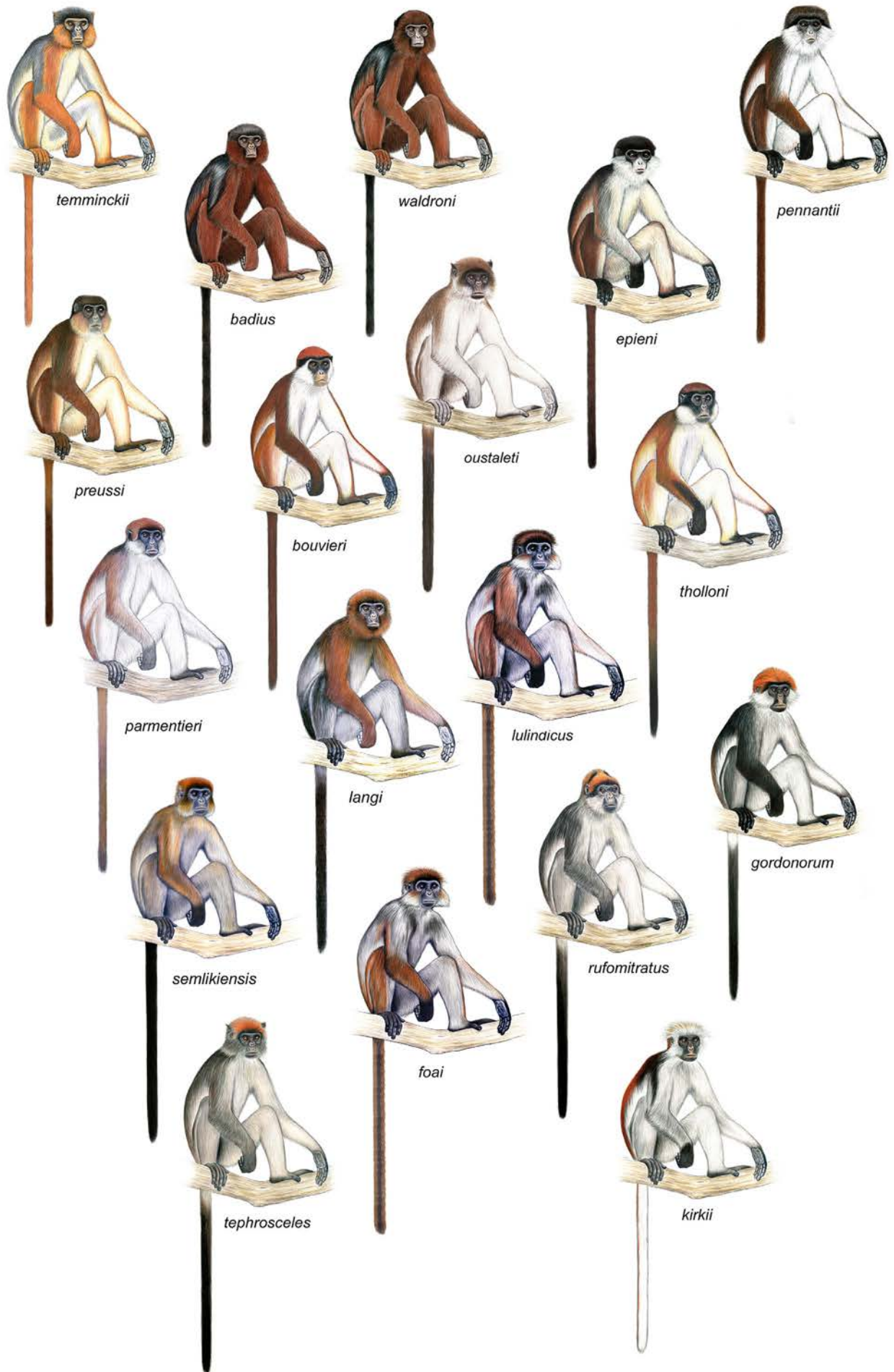


Figure 2. The 18 red colobus forms. Illustration by Stephen D. Nash

Table 1. Alphabetical list of countries where red colobus occur

| Country | Taxa |
|-----------------------------------|---|
| Cameroon | <i>P. preussi</i> |
| Central African Republic | <i>P. oustaleti</i> |
| Congo, The Democratic Republic of | <i>P. tholloni</i> , <i>P. oustaleti</i> , <i>P. langi</i> , <i>P. parmentieri</i> , <i>P. lulindicus</i> , <i>P. semlikiensis</i> , <i>P. foai</i> |
| Congo, Republic of | <i>P. bouvieri</i> , <i>P. oustaleti</i> |
| Côte d'Ivoire | <i>P. badius badius</i> , <i>P. waldroni</i> (possibly extirpated) |
| Equatorial Guinea | <i>P. pennantii</i> |
| Gambia, The | <i>P. badius temminckii</i> |
| Ghana | <i>P. waldroni</i> (likely extirpated) |
| Guinea | <i>P. badius badius</i> , <i>P. badius temminckii</i> |
| Guinea-Bissau | <i>P. badius temminckii</i> |
| Kenya | <i>P. rufomitratu</i> |
| Liberia | <i>P. badius badius</i> |
| Nigeria | <i>P. epieni</i> , <i>P. preussi</i> |
| Senegal | <i>P. badius temminckii</i> |
| Sierra Leone | <i>P. badius badius</i> , <i>P. badius temminckii</i> (?) |
| South Sudan | <i>P. oustaleti</i> |
| Tanzania, United Republic of | <i>P. gordonorum</i> , <i>P. kirkii</i> , <i>P. tephrosceles</i> |
| Uganda | <i>P. tephrosceles</i> , <i>P. semlikiensis</i> |

Conservation status

The conservation status of African primates was reassessed in 2016 at the IUCN SSC Primate Specialist Group African Primate Red List Assessment workshop in Rome, Italy. The subsequently published IUCN Red List assessments indicate that every form of red colobus monkey is threatened with extinction, and 14 of the 18 taxa are listed as Critically Endangered or Endangered (Table 2). Five red colobus taxa – Miss Waldron's red colobus (*P. waldroni*), the Niger Delta red colobus (*P. epieni*), Pennant's red colobus (*P. pennantii*), Preuss's red colobus (*P. preussi*), and the Tana River red colobus (*P. rufomitratu*) have appeared regularly on the list of the World's Top 25 Most Endangered Primates. Miss Waldron's red colobus may have been hunted to extinction – possibly the first primate species to go extinct in over 400 years and, as such, highlighting the threatened status of this group of primates.

Despite their conservation status, only two red colobus species (*P. kirkii* and *P. rufomitratu*) are listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora on Appendix I, which includes the species most threatened with extinction and prohibits the international commercial trade in specimens of those species.

Table 2. Red colobus IUCN Red List conservation status (2021). Taxa are listed as they are found in Africa from west to east and as they are presented in this action plan.

| Common name | Scientific name | IUCN Red List status |
|----------------------------|-----------------------------|-------------------------------------|
| Temminck's red colobus | <i>P. badius temminckii</i> | Endangered ⁹ |
| Bay colobus | <i>P. badius badius</i> | Endangered ¹⁰ |
| Miss Waldron's red colobus | <i>P. waldroni</i> | Critically Endangered ¹¹ |
| Niger Delta red colobus | <i>P. epieni</i> | Critically Endangered ¹² |
| Pennant's red colobus | <i>P. pennantii</i> | Critically Endangered ¹³ |
| Preuss's red colobus | <i>P. preussi</i> | Critically Endangered ¹⁴ |
| Bouvier's red colobus | <i>P. bouvieri</i> | Endangered ¹⁵ |
| Oustalet's red colobus | <i>P. oustaleti</i> | Vulnerable ¹⁶ |
| Tshuapa red colobus | <i>P. tholloni</i> | Vulnerable ¹⁷ |
| Lomami red colobus | <i>P. parmentieri</i> | Endangered ¹⁸ |
| Kisangani red colobus | <i>P. langi</i> | Endangered ¹⁹ |
| Ulindi red colobus | <i>P. lulindicus</i> | Endangered ²⁰ |
| Semliki red colobus | <i>P. semlikiensis</i> | Vulnerable ²¹ |
| Foa's red colobus | <i>P. foai</i> | Endangered ²² |
| Ashy red colobus | <i>P. tephrosceles</i> | Endangered ²³ |
| Tana River red colobus | <i>P. rufomitratus</i> | Critically Endangered ²⁴ |
| Udzungwa red colobus | <i>P. gordonorum</i> | Vulnerable ²⁵ |
| Zanzibar red colobus | <i>P. kirkii</i> | Endangered ²⁶ |

Threats

The primary threats to red colobus are very clear: commercial and subsistence hunting as well as habitat loss, degradation, and fragmentation resulting from numerous factors (i.e., logging, mining, charcoal production, infrastructure development, and conversion of forest to farms and agricultural plantations).^{7,27} These threats are driven by the confluence of both global and local demands for natural resources (e.g., land for agriculture, timber, charcoal, firewood, minerals, meat), increasing human population size (via both intrinsic growth and migration), and increasing levels of resource consumption *per capita*. Red colobus monkeys do not adapt well to hunting pressure and have the reputation of being the easiest monkeys to hunt. They are easy to find, as their large and noisy groups attract hunters' attention, and once they see a hunter they typically do not flee, just watch the human below.²⁷ They are game of choice for gun-hunters as their large size provides more meat for the price of a cartridge than the smaller monkeys such as guenons with which they share their range. Due to their susceptibility, red colobus are generally the first primates to be extirpated from an area. Indeed, red colobus can be considered as early indicators of a larger faunal decline, like the canary in a coal mine. Their demise is indicative of what is happening to all of the larger animals throughout the African tropical forest zone.

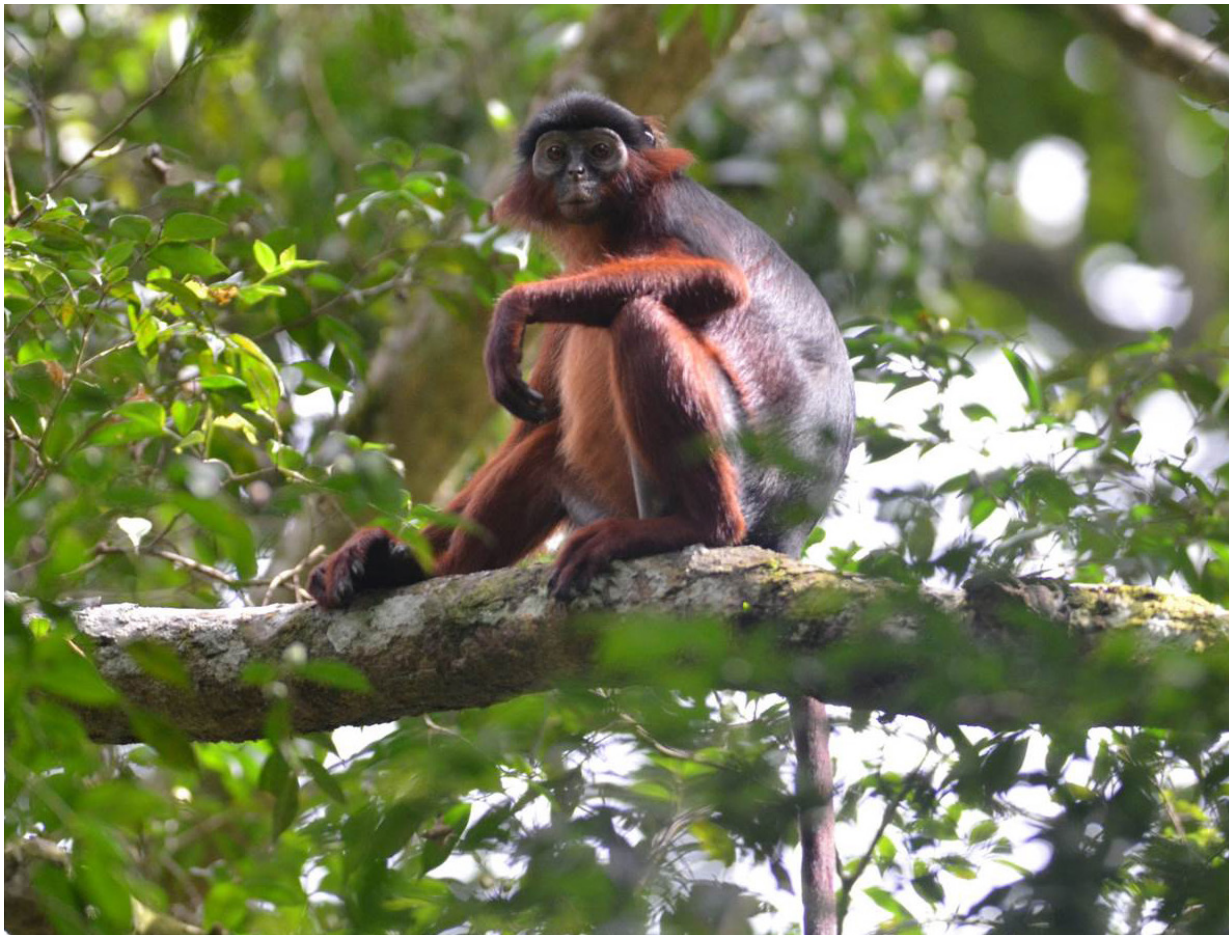
RED COLOBUS ACTION PLAN RATIONALE AND GOAL

In 1996, the Primate Specialist Group's *African Primates: Status Survey and Conservation Action Plan*. Revised edition²⁶ called for a red colobus action plan to be prepared and implemented given the large number of highly localized and threatened populations of red colobus monkeys. Nearly 10 years later, Thomas Struhsaker²⁷ reviewed the status of, and threats to, red colobus monkeys, and presented a conceptual framework for their conservation. Despite these calls to action, the conservation status of most red colobus species has continued to worsen, researchers have studied only a few populations in detail, and the general public is largely unaware of these monkeys. General awareness of red colobus and their plight is further hindered by the lack of any captive populations in zoos around the world – these monkeys have never done well in captivity. All red colobus taxa are threatened with extinction and several forms are on the brink, thus making them the most threatened group of monkeys in Africa. Red colobus monkeys are facing an extinction crisis requiring urgent *in situ* conservation action.

A concerted and coordinated range-wide and taxon-based conservation effort, as laid out in this action plan, is urgently required to conserve all red colobus forms. Implementation of this action plan is important for the conservation not only of red colobus monkeys, but also for the conservation of African tropical forests.²⁷ Focusing conservation efforts on red colobus could protect many other species inhabiting the same area. Their ranges overlap, for example, with those of at least 75% of other primate species on mainland Africa, including all the African apes and more than 50% of African ape habitat.

The goal of this plan is to unite and mobilize local and international conservation groups, governments, communities, academic and research institutions, zoos and wildlife centres, and other interested parties to prevent red colobus extinctions and protect the viable and representative populations of each taxon.

We see this approach as a dynamic effort, one that can be adapted according to circumstances and with information acquired through frequent monitoring and reporting of red colobus populations, their habitats, and the effectiveness of conservation actions.



Piliocolobus badius badius. © W. Scott McGraw

RANGE-WIDE CONSERVATION PRIORITIES

The key to preventing red colobus extinctions and improving their conservation outlook rests on implementing the taxon-specific recommendations and the following range-wide conservation priorities, each of which includes a description of actions that can be addressed within the time frame of this action plan (2021–2026).

1. Improve knowledge on the distribution, abundance, population size, ecological relationships, and demographic structure of each red colobus form

Surveys are urgently needed for most taxa in order to assist in setting conservation priorities and understanding conservation status. Surveys will confirm the presence of red colobus, reveal previously unknown populations that might have conservation significance, identify areas for protection, improve understanding about ecological needs such as habitat and food resources, and provide a baseline for monitoring changes through time in their distribution, abundance, and threats.

2. Improve and establish government-managed and community-based conservation areas

Protected areas, including government-managed areas and community-based conservancies and reserves and their buffer zones, are the cornerstone of biodiversity conservation worldwide and will be critical to the future of red colobus monkeys. Many of the protected areas that already exist face significant challenges that reduce their effectiveness, including insufficient human and financial resources, degradation and loss of habitat tied to human pressure and/or climate change inside and immediately outside their boundaries, socio-political crises, and lack of support from surrounding communities and/or central or regional governments. Some red colobus taxa have no populations in protected areas. A fundamental tenet in this action plan is that, where possible and appropriate, viable populations of each of the 18 red colobus forms should be protected in at least two relatively large and well-managed, strictly-protected areas (IUCN category I–IV in the case of a government-managed area). For those taxa that occur in more than one country, they should benefit from at least one well-managed protected area (or potential protected area) in each.

3. Engage with local communities and integrate them into red colobus conservation

There is a need to engage more effectively with people living in close proximity to red colobus monkeys in order to aid in the establishment and effective maintenance of protected areas and to reduce over-exploitation of natural resources. It is important to collaborate with communities adjacent to priority red colobus sites to reduce the impact of human activities that lead to forest loss or degradation. Hunting and commercial trade in bushmeat must be addressed immediately, while mitigating issues of food security that can arise from reducing access to forest resources. Such “bottom-up”, community-supported approaches require the development of projects that train, employ, and otherwise support (especially in the long term) local people to transition away from unsustainable harvesting of forest resources and to participate in monitoring and conservation activities, and that encourage communities to take a more active role in preserving forests and protecting endangered species.

4. Identify and remove barriers that prevent local access to healthcare and family planning services

Human population expansion continues to place increasing pressure on natural resources at both global and local levels, and underlies many of the proximate factors threatening red colobus populations. Human population expansion stems from intrinsic growth, as well as changing patterns in morbidity, mortality, and migration. To this end, and recognising that this is a sensitive issue, red colobus conservation would benefit from projects and partnerships that connect public health sectors and existing organizations working with local communities to address local barriers and access to healthcare and family planning. At least one of the priority sites identified for each red colobus taxon should be associated with a collaborative project that links conservation with public health and family planning that can serve as a model for wider application.

5. Raise local, national, and global awareness of red colobus monkeys and their habitats

Education outreach programmes, developed in collaboration with organizations and local institutions with skills in the environmental education domain, are needed to support protection efforts. Localized education outreach can help build and improve the long-term relationship between local communities and conservation, while inspiring people to get

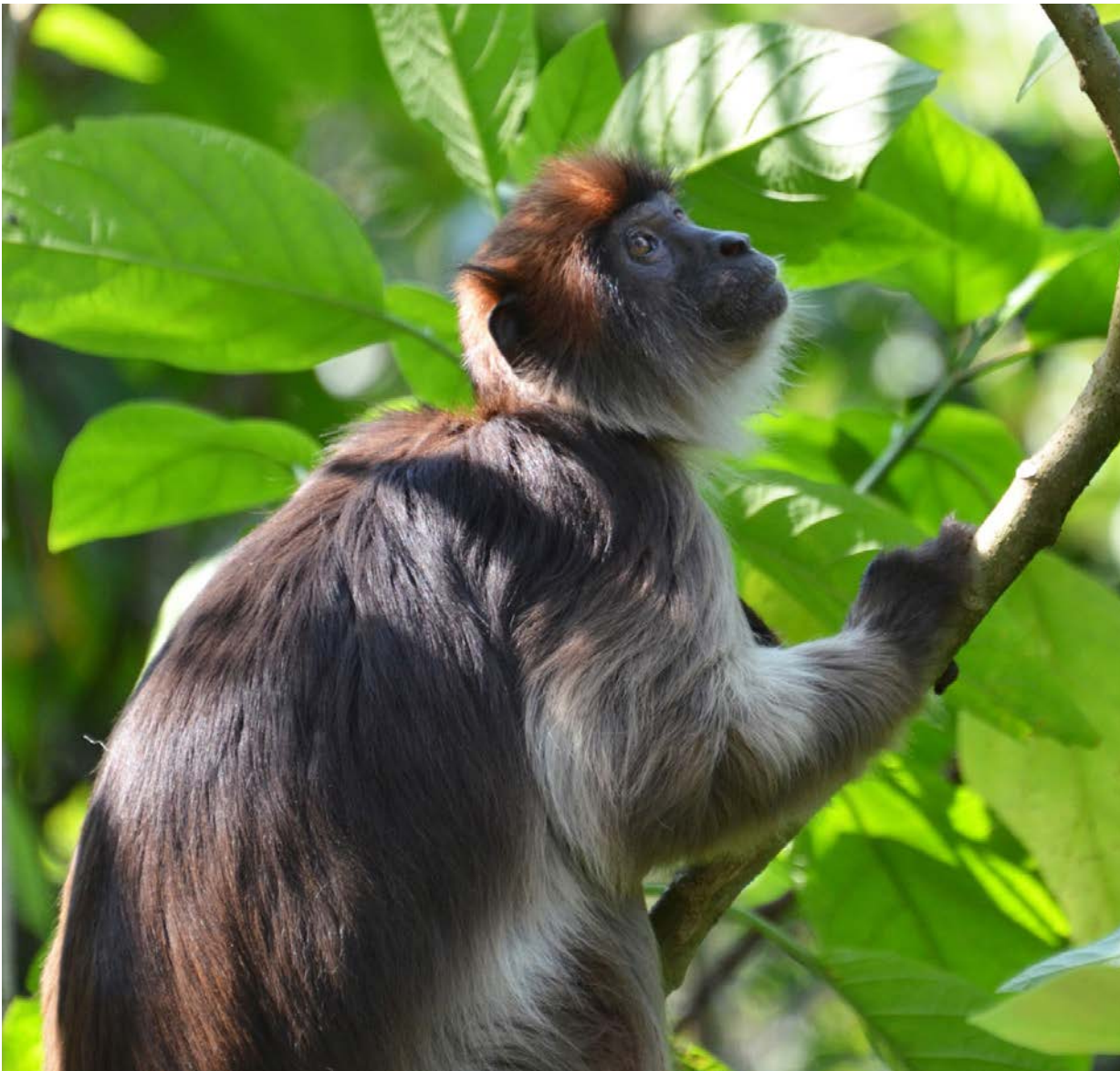
involved in conservation activities. For each taxon, at least one priority site identified (for each country in which the taxon occurs) should have at least one red-colobus focused education and awareness programme geared towards people living near red colobus habitat. Outside the field of primatology, red colobus monkeys are poorly known to the general public, as is their conservation status. A coordinated, global campaign should attempt to elevate red colobus monkeys to the status of flagship species to help rally public support for African tropical forest conservation and to increase funding and capacity for red colobus protection efforts.

6. Create a global network of red colobus researchers and conservation practitioners

A red colobus network of researchers, conservation practitioners, government institutions, zoos and wildlife sanctuaries, and volunteers is needed to improve communication, collaboration, and coordination around red colobus conservation. A Red Colobus Working Group has been formed under the IUCN SSC Primate Specialist Group, a working group coordinator has been appointed, and a red colobus network has been established to support the development, implementation, and monitoring of the range-wide and taxon-specific conservation recommendations presented in this plan.

7. Increase government support for the conservation of red colobus and their habitats

This conservation plan is more likely to be successful if there is strong political will from the governments of the countries where red colobus monkeys live. This includes publicly acknowledging conservation needs, reviewing national legal frameworks and addressing gaps related to red colobus protected status, enacting relevant environmental policy, and ensuring the implementation of laws that protect these primates and their habitats.



Piliocolobus tephrosceles. © Nelson Ting

RED COLOBUS CONSERVATION ACTION PLAN TAXONOMIC ENTRIES

The remainder of this action plan is organized according to the 18 red colobus taxa (presented from west to east) listed by the current IUCN Red List of Threatened Species™. Researchers and conservation practitioners familiar with each taxon contributed to a narrative (adapted from the IUCN Red List entry) describing that taxon's population status and threats to its survival. Conservation priorities were then identified for each taxon.

All red colobus forms are threatened but some are in greater danger than others. For this reason, some conservation actions have higher priority than others. More specifically, we believe the most immediate attention (and funding) should be directed at the five Critically Endangered forms that are at highest risk of extinction in the near future if no actions are taken.

Multiple criteria were used to identify taxon-specific priority conservation sites (e.g., sites with the most viable population, protected areas under severe threat from human activities). Contributors to each taxon entry prioritized conservation actions by identifying smaller-scale projects (e.g., surveys, ecological research, outreach, engagement, and capacity building) that could be completed within the 5-year timeframe (2021–2026) and estimating the cost of those projects (Appendix). While the smaller-scale actions will help improve the short-term conservation status for the highest priority populations, a much larger and sustained investment of resources is needed to secure the long-term survival of red colobus monkeys across Africa. Contributors, therefore, also identified long-term or recurrent actions that require considerable investment from the governments of red colobus range countries and that are typically associated with government spending (e.g., projects that establish protected areas, biomonitoring programmes, or law enforcement patrols). The costs of these kinds of actions are difficult to estimate, but would likely exceed US\$ 17 million across all red colobus taxa over five years.

A list of all recommended actions identified in this action plan and associated budgets can be downloaded from: www.redcolobusnetwork.org/actionplan



Piliocolobus kirkii. © Thomas T. Struhsaker

WESTERN RED COLOBUS

Piliocolobus badius

ENDANGERED

The Western red colobus (*Piliocolobus badius*) occurs in fragmented populations across seven countries, from The Gambia and southwest Senegal, south and east to the Nzi-Bandama River system in western Côte d'Ivoire.^{3,29,30} The coat of the Western red colobus is a combination of black/grey (face, crown, dorsum, tail) and red/orange (ventrum and limbs), although across its range pelage colour varies from orange to auburn and from grey to shiny black. Coat colouration varies within single populations.⁷

The Western red colobus has two subspecies: Temminck's (*P. b. temminckii*) and the Bay colobus (*P. b. badius*). The geographic boundary separating these taxa is unclear because the subspecies grade into one another.^{3,30} Red colobus observed from the Kilimi area of northwestern Sierra Leone (hashed area in the map below) reportedly have a coat colouration similar to typical *temminckii*³¹, while further south and east in Sierra Leone only typical *badius* colouration is observed.

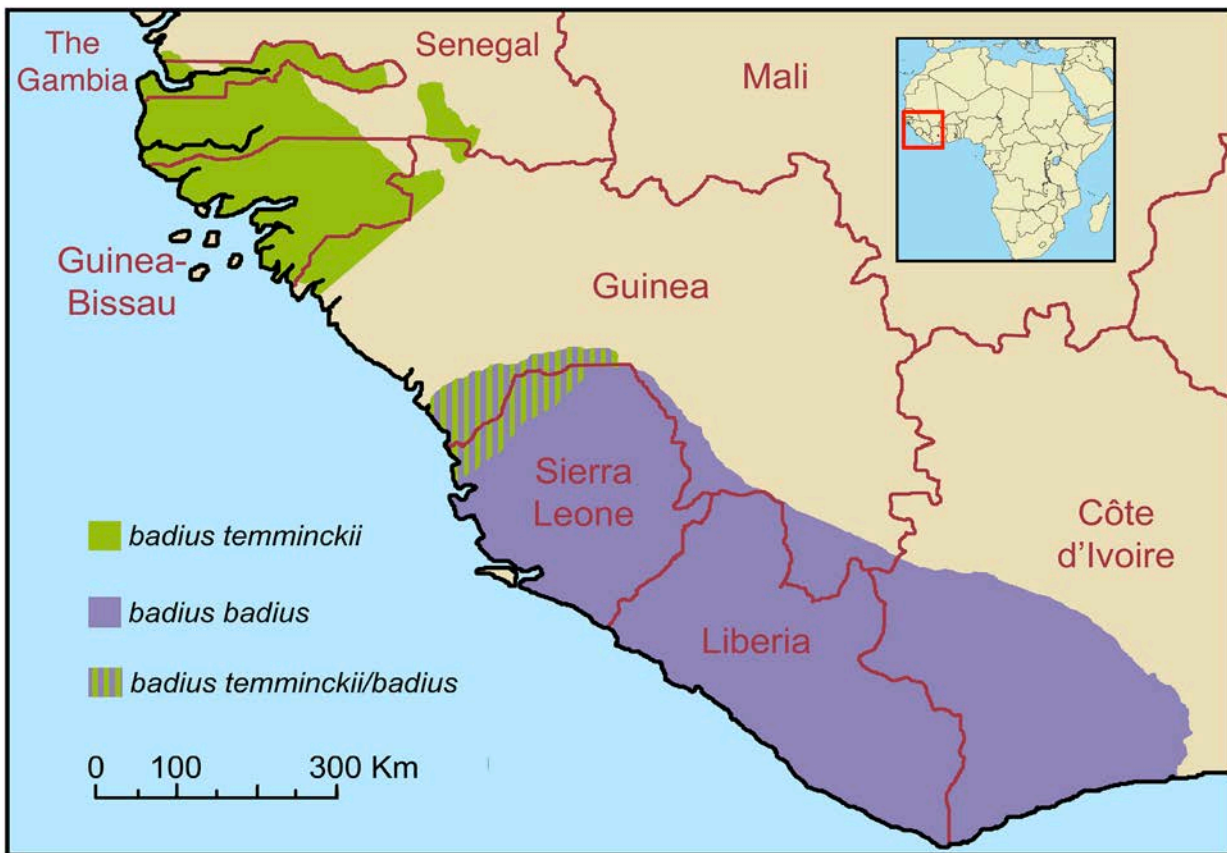
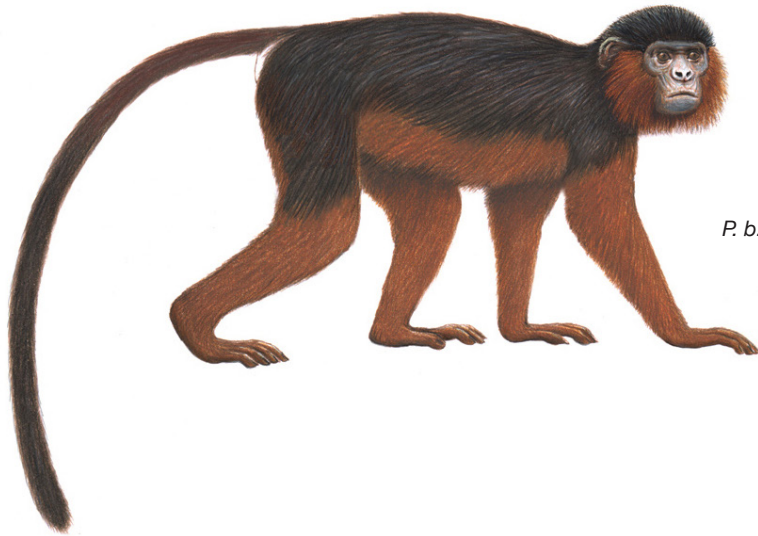


Figure 3. *Piliocolobus badius* distribution (Map by Stephen D. Nash)



P. b. temminckii

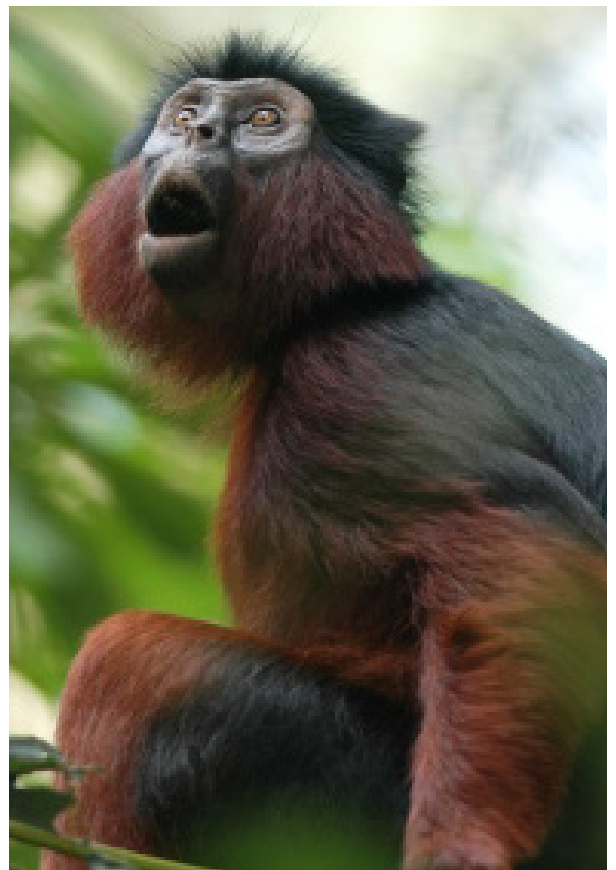


P. b. badius

Figure 4. *Piliocolobus badius* forms: *P. b. temminckii* and *P. b. badius*. Illustration by Stephen D. Nash



Piliocolobus badius temminckii. © Michael Mayhew



Piliocolobus badius badius. © W. Scott McGraw

TEMMINCK'S RED COLOBUS

Piliocolobus badius temminckii

ENDANGERED

Temminck's red colobus, the western-most member of the genus, is endemic to southern Senegal, The Gambia, Guinea Bissau, northwestern Guinea^{29,32}, and possibly northwestern Sierra Leone.³¹ The distribution and current range limits of Temminck's red colobus, including its boundary with the Bay colobus, are unclear, complicating conservation planning.^{31,33,34}

The main conservation threats vary by location and include habitat loss, hunting, and infectious diseases (e.g., yaws). Infrastructure development, agricultural expansion, tree harvesting, human-induced fires, and decreased rainfall stemming from anthropogenic factors and climate change are primary drivers of habitat loss and degradation. Most protected areas that have Temminck's red colobus are small islands of habitat surrounded by towns, roads, farms, and buildings; forest cover within these protected areas is declining. These threats have led to a highly fragmented, and declining population. The number of Temminck's red colobus monkeys across their entire range is unknown, but estimates from surveys suggest there may be as few as 2,000 remaining.

Although Temminck's red colobus occur in almost two dozen protected areas, many of these are very small (< 6 km²), disconnected, and shrinking. Even in the largest protected areas, the monkeys tend to be restricted to small patches of undisturbed habitat.

In Senegal's Delta du Saloum National Park (1,800 km²), red colobus are found only in the Fathala Forest Reserve and nearby mangroves (76 km²) and this population of approximately 500 individuals has declined by at least 20% over the last 45 years.³⁵ Colobus monkeys living in core gallery forests, where individuals do not move on the ground and where human presence is less frequent, are significantly less infested with intestinal parasites than those living in more open habitat and near human presence – there they are also more vulnerable to pythons, hyenas and dogs.³⁵ Senegal's Niokolo Koba National Park is home to c. 300 red colobus monkeys. In these savanna areas, bush fires are frequent and constitute a real danger for the red colobus because, unlike most animals, they do not flee but take refuge at the top of the trees where they die from asphyxiation.^{35,36} Hunting has reportedly extirpated Temminck's red colobus from Senegal's Casamance National Park and decimated the wildlife in Niokolo Koba National Park.³⁷

An important and relatively large red colobus population occurs in Guinea-Bissau's highly fragmented Cantanhez Forest National Park, with an estimated population of c. 300 adults but declining.³⁸ Elsewhere in Guinea-Bissau, Temminck's red colobus have been confirmed in the relatively large Dulombi and Boé National Parks but population estimates are unavailable and they may occur only in patches of community sacred forests.^{32,39} Temminck's red colobus are present but seem to be rare in Guinea Bissau's Cufada Lagoons National Park.³⁹

The Gambia is by far the smallest of the Temminck's red colobus range countries; however, its status there is particularly well known thanks to several people and programmes interested in wildlife conservation. The forest around Sambel Kunda in the Central River Region near the River Gambia National Park is estimated to have the largest known national red colobus population, with a minimum of 587 individuals.⁴⁰ Fewer than 110 red colobus monkeys are found in The Gambia's Abuko Nature Reserve. Populations of red colobus in The Gambia's Kiang West National Park, Niuni National Park and River Gambia National Park (Baboon Island) require more survey effort, but rapid assessments in 2019 identified 58 red colobus monkeys in Kiang West, and 80 on Baboon Island. Surveys in 1996⁴¹ and further observations in 2005⁴² in Njassang Forest Park (on the south bank of the River Gambia, adjacent to the River Gambia National Park) confirmed the presence of several groups of Temminck's red colobus. Approximately half of the area they formerly used in The Gambia's Bijilo Forest Park has been cleared for development, destroying an important habitat corridor, isolating two neighbouring populations, and resulting in displaced monkeys moving into nearby hotel gardens. There, as well as in the Abuko Nature Reserve and surrounding areas, habitat loss and degradation have increased contact between red colobus monkeys and humans, leading to greater hunting, persecution, and disease transfer from humans and domesticated animals.^{43,44} The Pirang forest groups have sought refuge in the Pirang Bonto Community Forest.⁴⁵ Most remaining forest in The Gambia suffers from logging and collection of non-timber forest products.

Harding³¹ described a population of red colobus monkeys observed in the Kilimi section of Outamba-Kilimi National Park, Sierra Leone, as resembling Temminck's red colobus in colouration, but that there has been no follow-up study since that time.

Priority sites

| Country | Priority sites |
|---------------|---|
| The Gambia | Pirang Forest Park, Kiang West National Park, River Gambia National Park and surrounding ecosystem (including Njassang Forest Park and Sambel Kunda area) |
| Senegal | Niokolo Koba National Park, Forêt Classée des Narangs, Fathala Forest Reserve in Delta du Saloum National Park |
| Guinea Bissau | Cantanhez National Park, Dulombi and Boé National Parks |
| Guinea | Badiar National Park |
| Sierra Leone | Outamba-Kilimi National Park (and contiguous habitat in Guinea) |

Priority objectives and recommended actions

| Estimated budget* US\$ 329,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | Conduct forest surveys in and between protected areas in The Gambia, Casamance region and Forêt Classée des Narangs in Senegal, southern and northwestern Guinea-Bissau and north and western Guinea |
| | Conduct forest surveys in Niokolo Koba National Park |
| | Conduct forest surveys in Outamba-Kilimi National Park, Sierra Leone to investigate presence of red colobus monkeys and, if found, assess population status and taxonomic affinity |
| Strengthen protection and conservation | Pirang Forest Park, The Gambia <ul style="list-style-type: none"> • Build a perimeter fence • Plant hedges and trees to improve corridors connecting the main forests • Build boreholes to provide fresh water for red colobus monkeys and other wildlife • Train local community members to become tourist guides and forest guards |
| | Kiang West National Park, The Gambia <ul style="list-style-type: none"> • Develop awareness programmes to sensitise the community about red colobus conservation • Implement forest patrols to reduce illegal logging • Build boreholes to provide fresh water for red colobus monkeys and other wildlife • Develop a park management plan including delineating zones of high/low-use areas and promote focused enforcement measures in red colobus priority areas |
| | River Gambia National Park and surrounding ecosystems <ul style="list-style-type: none"> • Improve and implement forest patrols in gallery forests in the national park to reduce illegal logging • Implement a biomonitoring programme in the national park and surrounding ecosystems • Develop a forest management plan outside park areas to describe and quantify forest products, establish use categories through forest zonation, and identify red colobus priority areas • Develop tree nurseries and woodlots to establish a sustainable alternative source of forest products and to restore degraded forest areas • Upgrade boreholes to provide water sources for red colobus monkeys • Develop awareness programmes to sensitise surrounding communities about red colobus conservation |

*Excluding costs of long-term/recurring actions

Priority objectives and recommended actions (continued)

| Priority objectives | Recommended actions |
|---|--|
| Strengthen protection and conservation | Niokolo Koba National Park <ul style="list-style-type: none"> • Rehabilitate guard posts • Support/enhance patrol efforts within the park, including rehabilitation of guard posts |
| | Fathala Forest Reserve in Delta du Saloum National Park <ul style="list-style-type: none"> • Build perimeter fence to reduce illegal exploitation of resources • Complete construction and staffing of the research station • Improve water availability and access for red colobus |
| | Cantanhez National Park <ul style="list-style-type: none"> • Hire, train, and equip park guards to enforce hunting laws • Develop and implement a wildlife monitoring programme to assess population status of red colobus monkeys and human threats • Collaborate with local communities to develop education/awareness materials centred on red colobus monkeys |
| | Dulombi and Boé National Parks <ul style="list-style-type: none"> • Develop and implement a wildlife monitoring programme to assess the population status of red colobus monkeys and human threats • Collaborate with local communities to develop education/awareness materials and campaign centred on red colobus monkeys |
| | Badiar National Park <ul style="list-style-type: none"> • Support/enhance patrol efforts along the Gambia and Koulountou rivers including rehabilitating guard posts |



Piliocolobus badius temminckii. © Dawn Starin

BAY COLOBUS

Piliocolobus badius badius

The Bay colobus is found in Sierra Leone, southern Guinea, Liberia, and western Côte d'Ivoire.^{3,29,30} The eastern extent of its distribution historically met that of Miss Waldron's red colobus (*Piliocolobus waldroni*) at Côte d'Ivoire's Bandama River.

The most immediate threat to the Bay colobus throughout its range is hunting for subsistence and to supply the commercial trade in bushmeat, which is driven to a significant degree by demand from urban centres and from mining and logging camps located in and around forests.^{46,47} Signs of hunting are encountered frequently during surveys of forests where red colobus occur. Deforestation through logging, charcoal production, mining, and the spread of subsistence farming has occurred over much of this monkey's range. Large-scale, industrial agriculture may also be an increasing threat. High rates of human population growth throughout the Bay colobus range have intensified hunting and deforestation. Civil conflict in Côte d'Ivoire, Liberia, and Sierra Leone from 1989 to 2011 has, in some cases, exacerbated threats facing this monkey.

There are no overall population estimates for the Bay colobus, but the most recent surveys indicate that it has disappeared from and is declining across much of its range.

In Côte d'Ivoire, the Bay colobus is now largely restricted to Taï National Park. Surveys of Taï conducted in 2006 and 2008 generated estimates of c. 97,000 red colobus monkeys, with most located in the park's northwestern portion.⁴⁸ This figure is near the c. 100,000 individuals estimated in 1985.⁴⁹ Estimates from genetic data collected in the park in 2004 to 2010 suggested that there are now only 18,505–37,860 adult individuals.⁵⁰ The Bay colobus may also occur in the Cavally Classified Forest to the north of Taï National Park⁵¹ and in relic forests in the Tonkpi region, near Côte d'Ivoire's border with Guinea and Liberia.⁵² There are recent conflicting reports of the existence of the Bay colobus in and around Mount Nimba Strict Nature Reserve, straddling the border of Côte d'Ivoire and Guinea.

Information on the range and abundance of the Bay colobus in Liberia is scant. It is possible that a sizeable population exists in Sapo National Park, but surveys are needed to confirm this. To the north of Sapo National Park, red colobus were encountered on two ridges (Jideh, Ghi) during 2011 surveys in the Putu Mountains, but this area is threatened by an iron-ore mining project.⁵³ This species was confirmed to be present in the newly-created Grebo-Krahn National Park⁵⁴ and the corridor linking it to Sapo National Park.⁴⁶ In 2005, Bay colobus were confirmed in

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Piliocolobus badius badius. © W. Scott McGraw

Liberia's North Lorma National Forest⁵⁵ and were sighted during 2013–2014 surveys of the Kpayan district in Sinoe County.⁵⁶ Red colobus were recorded in Liberia's Gola Forest National Park and Foya Natural Forest during rapid assessment surveys in 2017 and were encountered during 2016–2017 primate and hunter surveys in Tonglay and Norman Community Forests adjacent to Gola Forest National Park.⁵⁷

In Sierra Leone, the Bay colobus is found in Gola Rainforest National Park, where there may be over 5,000 red colobus with group densities almost two times higher in the northern section of the park than in other park areas.⁵⁸ Bay colobus are also still present in Sierra Leone's Tiwai Island Wildlife Sanctuary⁵⁹ and in the Kambui Hills Forest Reserve, Kangari Hills Non-hunting Forest Reserve, and Loma Mountains National Park.⁶⁰ Harding⁶¹ reported red colobus in the Kilimi section of Sierra Leone's Outamba-Kilimi National Park in 1981–1982 and described these animals as resembling Temminck's red colobus. The status of this population and its taxonomic affinity needs investigation.

Priority sites

| Country | Priority sites |
|---------------|--|
| Côte d'Ivoire | Taï National Park |
| Liberia | Sapo National Park, Grebo-Krahn National Park |
| Sierra Leone | Gola Rainforest National Park, Loma Mountains National Park, Tiwai Island Wildlife Sanctuary |

Priority objectives and recommended actions

| Estimated budget* US\$ 97,000 | |
|---|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | Cavally Classified Forest, Côte d'Ivoire and forests west of the Cavally River in eastern Liberia |
| | Tonkpi region, Côte d'Ivoire |
| | Mount Nimba area, Guinea/Côte d'Ivoire/Liberia |
| | Greater Gola Landscape – assess existence of forest corridors, and their use by red colobus between Gola Rainforest National Park, Gola Forest National Park, Tiwai Island Wildlife Sanctuary, and Kambui Hills Forest Reserve |
| Strengthen protection and conservation | Taï National Park, Côte d'Ivoire: <ul style="list-style-type: none"> • Construct one ranger and one research station in the eastern portion of Taï National Park • Train and deploy rangers; staff ranger station in eastern Taï National Park |
| | Sapo National Park and Grebo-Krahn National Park, Liberia; Loma Mountains National Park, Sierra Leone: <ul style="list-style-type: none"> • Evaluate status of red colobus and threats • Develop recommendations for targeted red colobus conservation activities |
| | Gola Rainforest National Park, Sierra Leone: <ul style="list-style-type: none"> • Construct two ranger stations (one in Gola Central, one in Gola South) • Train rangers and staff for both ranger stations • Hold workshops to update the management plan for the Greater Gola Landscape |

*Excluding costs of long-term/recurring actions

MISS WALDRON'S RED COLOBUS

Piliocolobus waldroni

Miss Waldron's red colobus, first described as a distinct taxon in 1933, is endemic to eastern Côte d'Ivoire and western Ghana, with a possible historical range from the Nzi-Bandama River system in southeastern Côte d'Ivoire to southwestern Ghana.³⁰ Surveys conducted in Ghana and Côte d'Ivoire between 1993 and 1999 found no evidence of surviving populations, leading Oates et al.⁶¹ to conclude that this monkey was probably extinct. This would have made Miss Waldron's red colobus the first documented case of a primate extinction in the twentieth century.

In 2002, a hunter living near swamp forests between the Ehy lagoon and Tanoé River (the Tanoé-Ehy Marsh Forests) in southeastern Côte d'Ivoire was found in possession of a skin with the distinctive colour pattern of Miss Waldron's red colobus, which the hunter said he killed six months previously.⁶² In 2004, red colobus calls were reportedly heard on the largest island of the Îles Ehotilé National Park in southeastern Côte d'Ivoire, but repeat surveys in 2005–2006 failed to find them.⁶³ In 2006, another red colobus skin was found in a village adjacent to Tanoé-Ehy⁶⁴, and in 2008 calls of red colobus were reported to have been heard in the same forest by a team of scientists from the Centre Suisse de Recherches Scientifiques.⁶⁵ Surveys carried out from 1993 to the present in Ghana and Côte d'Ivoire have failed to produce a confirmed sighting of living individuals, although red colobus were reportedly encountered near Comoé National Park in 1986.^{30,61,62,66-68} If a population or populations do still exist, they must be very small and occupy a very limited area.^{62,63}

The major causes of the decline of Miss Waldron's red colobus are hunting and habitat loss.⁶¹ Both subsistence and commercial hunting for the bushmeat trade are intense and pervasive in Côte d'Ivoire and Ghana and have almost certainly been the primary cause of this primate's probable extirpation. Logging, charcoal production, cacao farming, and clearance for subsistence and large-scale industrial agriculture have greatly reduced and fragmented the forest.⁶⁹

The last site for which some hope remains of finding and protecting a population of Miss Waldron's red colobus is the Tanoé-Ehy Marsh Forest in Côte d'Ivoire. This is the only location from which there is relatively recent evidence for their survival, and the forest is known to harbour other highly-threatened primates (particularly *Cercopithecus roloway* and *Cercocebus lunulatus*). In April 2019, camera traps were installed at multiple locations in the Tanoé-Ehy Marsh Forests in an attempt to obtain evidence of

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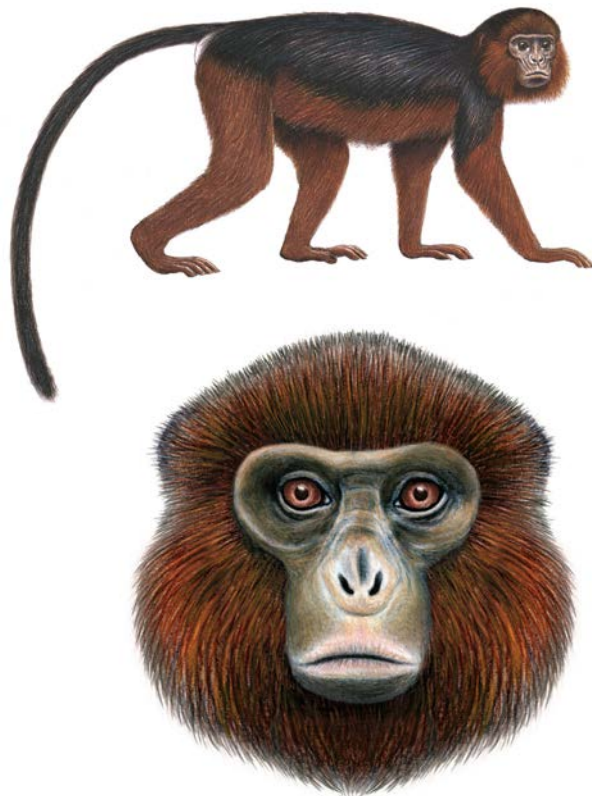


Fig. 5. *Piliocolobus waldroni*. Illustration by Stephen D. Nash

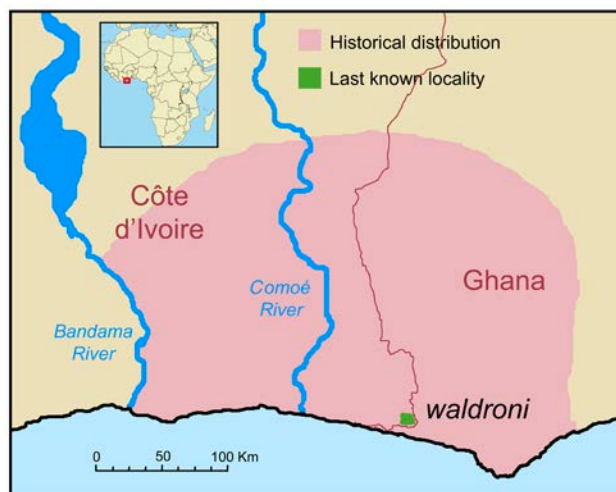


Fig. 6. *Piliocolobus waldroni* distribution. Map by Stephen D. Nash

surviving individuals, but at the time of writing no image of a red colobus monkey has been captured. In 2017, there was also a report by local people that they had seen red colobus monkeys in the Bossématié forest, also in southeastern Côte d'Ivoire, although the presence of red colobus there is unlikely given the extent of human disturbance in that forest. Forest surveys in Bossématié forest, conducted in May 2019, failed to find red colobus and confirmed that the few remaining forest fragments are severely degraded.

Priority sites

| Country | Priority sites |
|---------------|-------------------------|
| Côte d'Ivoire | Tanoé-Ehy Marsh Forests |

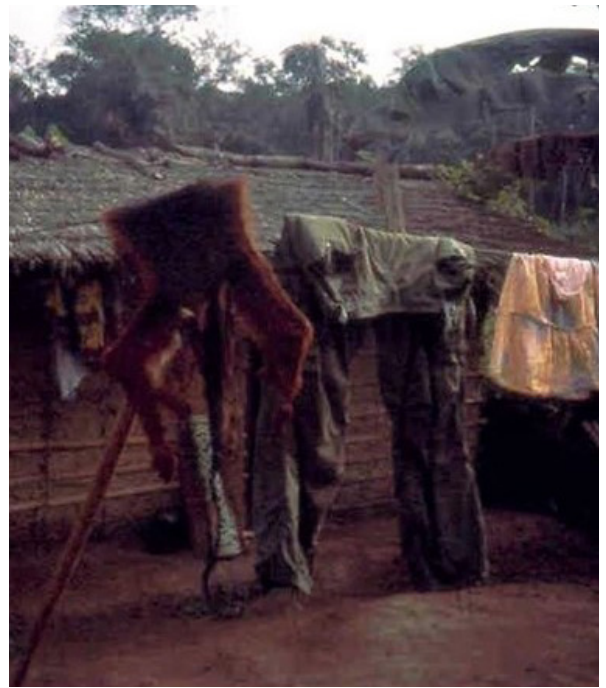
Priority objectives and recommended actions

| Estimated budget* US\$ 30,000 | |
|---|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | Conduct surveys in Tanoé-Ehy Marsh forest and formulate improved conservation measures focused on red colobus if evidence (photographs, video) of the monkey is obtained |

*Excluding costs of long-term/recurring actions



A carcass of a presumed Miss Waldron's red colobus said to have come from the Tanoé-Ehy forest (ca. August 2002). Photograph obtained by W. Scott McGraw



The skin from a potential Miss Waldron's red colobus in a village in Tanoé, Côte d'Ivoire: February, 2002. © W. Scott McGraw

NIGER DELTA RED COLOBUS

Piliocolobus epieni

The Niger Delta red colobus is endemic to the marsh forests in the western-central part of the Niger Delta of Nigeria^{30,70} and only became known to science in 1993 in the course of biodiversity surveys.⁷¹ Subsequent genetic research has shown that it is one of the most distinct red colobus forms, occupying its own divergent branch on the red colobus evolutionary tree.¹ The historical range of the Niger Delta red colobus is estimated to be about 1,500 km², extending from the Forcados River and Bomadi Creek in the northwest, the Sagbama-Osiama-Apoi creeks in the east, and the mangrove belt to the south.^{70,72} The clumped distribution of food species in the marsh forest may be a key factor restricting this species to its limited range.⁷² Surveys since 1993 suggest significant population declines, and range fragmentation and reduction.^{30,70,72-75}

The Niger Delta red colobus was believed to be relatively common across its limited range at the time it was discovered. Surveys conducted between 1994 and 1997 suggested that the population of this colobus was less than 10,000, but an accurate numerical census was not made.⁷² By the early 2000s, conflicts over oil, land, and human rights had intensified in the Niger Delta, hindering research and conservation activities in the region. Follow-up surveys in the Delta were not conducted until 2013. These surveys found evidence of red colobus presence (from sightings and local reports) in only half the 16 sites where this monkey was recorded in the mid-1990s. The current population may now number only in the hundreds, mainly in two forest patches – Apoi Creek forest area (c. 22 km²) and Otolu-Kolotoro-Ongoloba area (140 km²) – in the central southeastern part of their original range.

The oil and logging industries have dominated the social and economic affairs of the Niger Delta since the late 1950s. The infrastructure required to support the oil industry has facilitated human expansion into formerly unoccupied areas, leading to a significant increase in habitat loss and degradation from intensive artisanal scale logging and commercialized bushmeat hunting.⁷⁵

There are presently no legally protected areas for wildlife conservation in the Niger Delta. This is in part because the security situation in the Delta has been challenging for a long time, making it difficult to plan and implement effective conservation measures. However, as this region supports the second largest swamp forest in Africa and the third largest contiguous mangrove forest in the world, its conservation should be a top priority.⁷⁶ It is critical that protected areas be established, with the cooperation of all stakeholders, to prohibit natural resource overexploitation

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Piliocolobus epieni. © Rachel Ikemeh



Fig. 7. *Piliocolobus epieni* distribution. Map by Stephen D. Nash

in key remaining areas known to harbour the Niger Delta red colobus, and to control the hunting of this species. A protected area has already been suggested for special protected status in the Apoi Creek area in Bayelsa State particularly to conserve red colobus monkeys.⁷⁵ A Memorandum of Understanding has been signed by a local community to establish a community conservation area covering 10.1 km² in the Apoi Creek forests.⁷⁷ This would protect three known groups of red colobus living in those forests. Efforts are underway to get formal recognition at

the national and international level for this new community conservation area, but the community has commenced work to formalise the area by demarcating boundaries and enforcing community by-laws. Meanwhile, in late 2020 the President of Nigeria approved the proposal by the Nigeria National Park Service to establish 10 new national parks, amongst which would include the Apoi

Creek Forest Reserve covering 64.8 km². The creation of an effective park could take some time, however. Furthermore, the likely effectiveness of a new national park, or parks, needs to be carefully evaluated in comparison to the likely effectiveness of community conservancies, given the politics in this region and the relative effectiveness at present of other national parks in Nigeria.

Priority sites

| Country | Priority sites |
|---------|------------------------------|
| Nigeria | Apoi Creek forest area |
| | Otolo-Kolotoro-Ongoloba area |

Priority objectives and recommended actions

| Estimated budget* US\$ 130,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Increase formal protection of red colobus and its habitats | At the state level, formulate (or appropriately revise) and communicate laws and policies relevant to red colobus conservation |
| Conduct further surveys and research | Establish research programmes in the two priority conservation areas, including building research stations and training locally-recruited teams to monitor and study the range and feeding ecology of known red colobus groups |
| | Conduct field surveys in collaboration with locally-recruited teams to identify possible new red colobus populations in other areas and factor survey results into conservation planning |
| Raise awareness | Create an awareness campaign at both local community and state-wide levels using popular media outlets including radio, TV and print to educate and communicate the uniqueness of the Niger Delta red colobus, the ecological importance of the Niger Delta ecosystem, and the urgent conservation intervention required to save the species from extinction. |
| Promote partnerships that drive conservation objectives | Establish a forum that facilitates discussion of and promotes a conservation agenda among local communities, the private sector (especially oil companies), civil society groups and governmental bodies |
| | Establish conservation committees to develop and guide conservation actions in relevant communities in and around the priority areas |

*Excluding costs of long-term/recurring actions

PENNANT'S RED COLOBUS

Piliocolobus pennantii

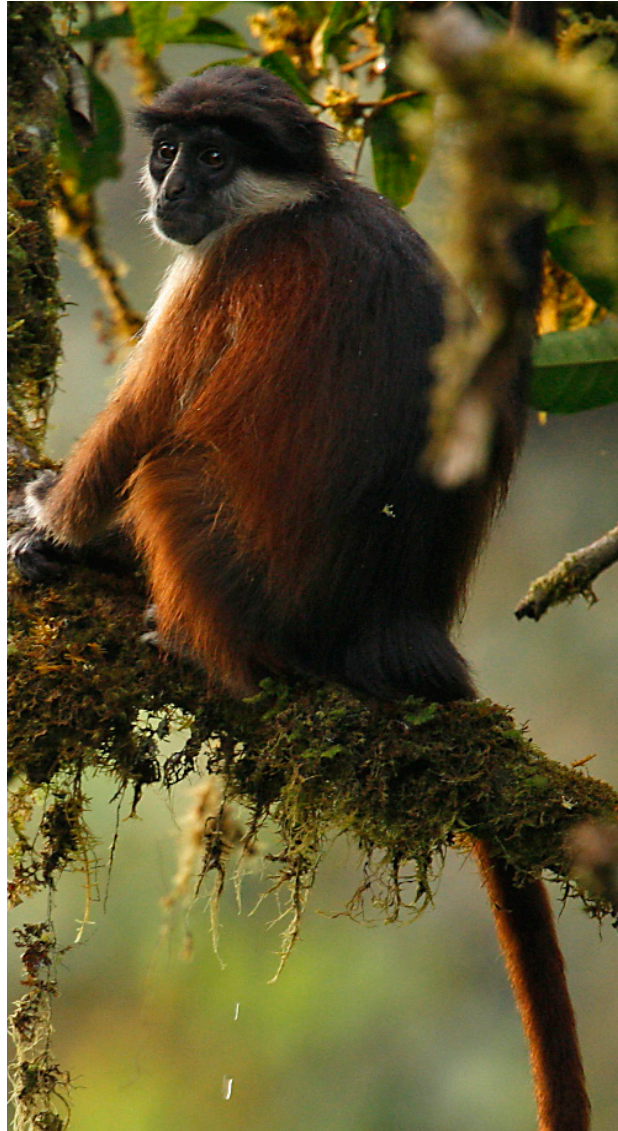
Pennant's red colobus is endemic to the island of Bioko, Equatorial Guinea, where it is now likely restricted to approximately 60 km² of monsoon and montane forests in the southwest in the Gran Caldera Scientific Reserve (GCSR).⁷⁸ It was believed to persist in the lldayi valley in southeastern Bioko until recently, and in Pico Basilé National Park in northern Bioko into the early 1990s^{13,79,80}, but there have been no records in subsequent studies in either area⁸¹⁻⁸⁶ and interviews with hunters who have worked extensively on Pico Basilé report not having seen them there for more than 30 years.⁸⁷

The major threats to this species are hunting^{88,89}, and habitat degradation, both of which are exacerbated by development projects. Cronin et al.⁸⁸ reported that 1,754 individuals were available in the Malabo bushmeat market between 1997 and 2010, with a further 679 recorded since the end of Cronin et al.'s study through August 2018.⁹⁰ Pennant's red colobus have been hunted at a lower rate than most of the other diurnal primate species due to their isolated range in remote areas of the GCSR. It is, however, the diurnal primate species most vulnerable to hunting pressure on Bioko.⁸⁹

Hunting has continued unabated in the GCSR since 2010.⁸⁹ The completion of a road bisecting the reserve in 2015, and the associated increase in anthropogenic disturbance in the GCSR, has eroded much of the isolation that had passively protected wildlife populations.⁹¹ The road has contributed to increased hunting in the reserve.⁹² There are probably less than 1,200 red colobus remaining on Bioko, with the species estimated to have suffered a >80% decline in numbers between 1986 and 2016.^{81,92,93}

Securing the long-term future of Pennant's red colobus requires committed involvement of the federal entities tasked with management of protected areas (the National Institute of Forestry Development and Protected Area Management [INDEFOR-AP] and the Ministry of Forests and the Environment) and more broadly from the Government of Equatorial Guinea. In recent years, INDEFOR-AP has deployed a limited, yet growing number of rangers in the GCSR to collect biological and hunting data, but they do not yet have the mandate or necessary resources to effectively protect all of the GCSR. Furthermore, the rangers are unarmed and have limited authority and capacity to enforce regulations against armed and often well-connected poachers.

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Piliocolobus pennantii. © Tim Laman-National Geographic



Fig. 8. *Piliocolobus pennantii* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|-------------------|---|
| Equatorial Guinea | Gran Caldera Scientific Reserve, Bioko Island |

Priority objectives and recommended actions

| Estimated budget* US\$ 160,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Increase formal protection of red colobus and its habitats | Develop and implement a comprehensive management plan for the GCSR including a zoning scheme and concrete law enforcement mechanisms |
| | Strengthen and enforce the existing bans on hunting in protected areas and the hunting, sale, or consumption of primates; expand the regulations to include a ban on all shotgun hunting |
| | Develop a systematic national database for ecological monitoring and law enforcement in protected areas |
| | Implement a series of capacity building workshops to establish and implement standardised monitoring, anti-poaching, and law enforcement protocols with INDEFOR |
| | Deploy monitoring and law enforcement patrols throughout the GCSR |
| | Establish (with government support) bushmeat checkpoints along key bushmeat trade routes, including building of check-point infrastructure, where necessary, and training of check point staff |
| Surveys | Conduct an island-wide survey of Bioko to assess presence/absence, relative abundance, and threats to red colobus, but with an emphasis on southern Pico Basilé National Park and the southeastern GCSR (Iladyi River valley) |

*Excluding costs of long-term/recurring actions

PREUSS'S RED COLOBUS

Piliocolobus preussi

Preuss's red colobus is endemic to western Cameroon and southeastern Nigeria where it is found in mature, high canopy forests.³⁰ Its range is divided into two populations. The largest population, estimated at 3,200–4,500, is found in the contiguous forests of the Nigeria-Cameroon border area, and specifically from the eastern (Ikpan) portion of the Oban Division of Nigeria's Cross River National Park (CRNP) and Cameroon's Korup National Park (KNP). Additional groups may also occur in the forests immediately to the north, east, and south of the KNP. Another, much smaller, population may still occur >180 km to the southeast of the KNP, in the Ebo-Makombe-Ndokbou forest block, within which lies the proposed Ebo Forest National Park (c. 1,100 km²).

The red colobus group-sighting frequency is very low in the KNP, and there has been a clear and consistent decline in relative abundance.⁹⁴⁻⁹⁷ Forest surveys suggest that red colobus monkeys may have been extirpated in forests outside and to the northeast of the KNP near the villages of Bajo and Mgbegati.^{98,99} In the Oban Division of the CRNP, group-sighting frequency based on ranger patrol data in 2015 was also extremely low (0.001 groups/km). Between 2002 and 2012 several red colobus groups were seen in the western portion of the Ebo forest and in the Ndokbou area. By 2010, red colobus groups were seen only in northwest Ebo.

Systematic line-transect surveys distributed across the Ebo forest in 2017 and 2018¹⁰⁰ and surveys conducted in the adjacent Makombe and Ndokbou forests in 2018¹⁰¹ failed to detect any red colobus monkeys. However, calls of red colobus were reported near Mt. Sinai in the Ndokbou forest in 2019.¹⁰² If red colobus are still present in the Ebo-Makombe-Ndokbou forests then they occur at very low densities and are at serious risk of being extirpated.

The current limited distribution of Preuss's red colobus is likely the result of a combination of hunting and loss of habitat. Subsistence and commercial hunting to supply the trade in bushmeat is the major factor leading to the decline of Preuss's red colobus, even in the two national parks (KNP and CRNP) in which the species occurs.¹⁰³⁻¹⁰⁶ Red colobus monkeys in this region have been shown to comprise a significant proportion of the annual bushmeat trade.¹⁰⁷ Deforestation through logging, small- and large-scale agriculture, mining, and infrastructure development also threaten Preuss's red colobus populations. Of particular and immediate concern, complicating the conservation of this species, is the expansion of large, agro-industrial oil-palm plantations adjacent to the

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Piliocolobus preussi. © Alexandra Hofner



Fig. 9. *Piliocolobus preussi* distribution. Map by Stephen D. Nash

KNP (SG Sustainable Oils Cameroon concession) and the proposed Ebo Forest National Park (Greenfil concession), and a proposed pineapple plantation inside the Oban Division of the CRNP. Decrees signed in February 2020 by the Government of Cameroon calling for the creation of two Forest Management Units (the regional term for logging concessions) that would have covered most of the proposed Ebo Forest National Park have been withdrawn as of August 2020, although the possibility that the Ebo forest will be classified for timber exploitation remains. Furthermore, conservation efforts in the KNP, the stronghold for Preuss's red colobus, have been suspended since 2017 due to civil unrest and instability in Cameroon's South West and North West regions.

Priority sites

| Country | Priority sites |
|----------|--|
| Cameroon | Korup National Park, Ebo-Makombe-Ndokbou forests |
| Nigeria | Cross River National Park (Oban Division) |

Priority objectives and recommended actions

| Estimated budget* US\$ 172,000 | |
|--|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence and threats to red colobus | <p>Cameroon:</p> <ul style="list-style-type: none"> • Korup National Park (to assess the status of red colobus populations following civil unrest and instability in the area) • Ebo-Makombe-Ndokbou forests (especially the Ebo forest, Mt. Sinai area of Ndokbou forest, and forests north of the Makombe River) • Ejagham forest (Forest Management Unit 11-005) • Nkwende Hills • Banyang Mbo Wildlife Sanctuary <p>Nigeria:</p> <ul style="list-style-type: none"> • Nkuesah Hills of CRNP-Oban • Ndebiji Hills |
| Strengthen protection and conservation | <p>Implement a monthly biomonitoring programme that is separate from the responsibilities of the park guards in Korup National Park</p> <p>In KNP and CRNP-Oban, increase the number of park guards and patrol coverage, implement regular guard-training workshops, upgrade guard equipment, improve the bonus system, and systematically improve anti-poaching patrol design and monitoring</p> <p>Conduct joint patrols with guards in the Cameroon-Nigeria transboundary area</p> <p>Re-establish and staff the research camp in northeastern KNP, near the village of Ikenge</p> <p>Work with the Government of Cameroon and local communities to formalize the creation of a legally protected area that covers the Ebo forest</p> |
| Engage with local communities and increase their participation in red colobus and forest conservation | <p>Assess local perceptions, knowledge, and use of red colobus monkeys in and around KNP, the CRNP-Oban, the Ebo-Makombe-Ndokbou forest block, and relevant urban centres</p> <p>Develop and implement with local partners sensitisation and education programmes in three villages each in and around KNP, CRNP-Oban, and Ebo-Makombe-Ndokbou forests (a total of nine villages)</p> |

*Excluding costs of long-term/recurring actions

BOUVIER'S RED COLOBUS

Piliocolobus bouvieri

Bouvier's red colobus is endemic to the Republic of Congo, and as recently as 2007 it was feared to be extinct as no reported sightings of it had occurred for decades.¹⁵ Historically, Bouvier's red colobus was known to occur on the right bank of the Congo River, along the lower reaches of the Alima to the mouth of the Likouala-aux-Herbes (i.e., west of the Sangha River), and the tributaries of the lower Congo River.^{29,108} Older records exist from an area much further south, in what is now the Lesio-Louna Reserve and the surrounding area. In the mid-1990s, however, Downer¹⁰⁹ and Ikoli et al.¹¹⁰ failed to find any red colobus in targeted surveys in the north of Lesio-Louna Reserve and the south of Lefini Reserve and it was then assumed they had been extirpated from this area.

Recent surveys (2007, 2014, 2015, and 2019) revealed that a northern population still exists west of the Sangha River and east of the Bokiba (Lingoué) and Likouala rivers in Congo. Bouvier's red colobus was recorded on five occasions in the large logging concession of Ngombe and in the Ntokou-Pikounda National Park.¹¹¹⁻¹¹³

At least a portion of the southern population also still exists. A group was recorded in 2016 in the south of Lesio-Louna Reserve^{114,115}, in gallery forest along the Loubilika River, in the least accessible area of the reserve, about 45 km west of a main road that links Brazzaville to towns to the north and about 65 km east of a smaller road system south of the source of the Lefini River. All recent surveys have been intensive, but records of this species are few and far between, suggesting that it is now rare wherever it occurs.

The major threat to this species is hunting. Like all red colobus species²⁷, Bouvier's red colobus is relatively slow-moving and easily hunted. Indeed, a recently photographed female and her infant in northern Congo were clearly visible for 15 minutes, watching the observers.¹¹¹ In the southern population, they are hunted and have become fewer over time.^{114,115}

Because the species appears to prefer riparian/swamp forest, direct effects of logging are unlikely to affect them as much as they might other primates in terra firma forests. However, in the north of its range, the increased access created by logging roads, and the immigration of people into concessions hoping for work will increase hunting pressure on this species. Fortunately for this animal, the large logging concession of Ngombe in which most of the species' population likely occurs is certified by the Forest Stewardship Council (FSC), anti-poaching efforts are highly effective, and low-impact selective logging means

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Piliocolobus bouvieri. © Lieven Devreese

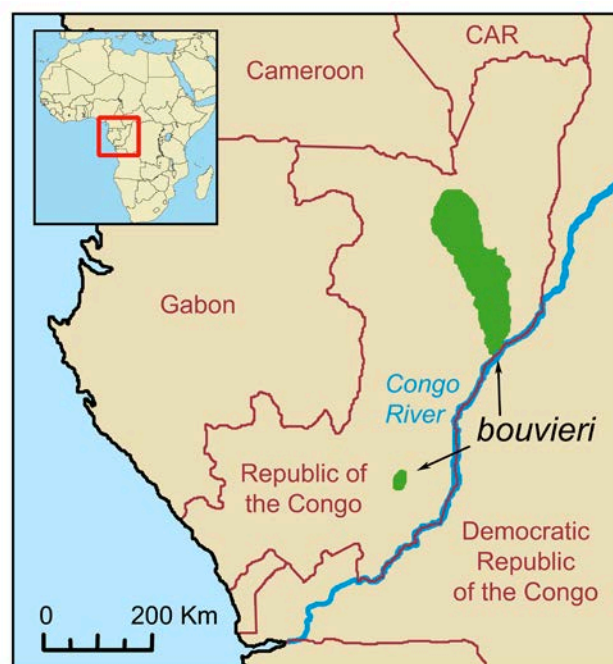


Fig. 10. *Piliocolobus bouvieri* distribution. Map by Stephen D. Nash

that the forest is left reasonably intact after the passing of the felling teams, and roads are physically blocked after timber extraction, following FSC standards. In the south of the range there is, as yet, little habitat transformation, but this may change in the future as the demand for charcoal from nearby Brazzaville, just four hours away on a tar road, is very high.

The known range of Bouvier's red colobus overlaps with both the recently (2013) gazetted Ntokou-Pikounda National Park in northern Congo and the Lesio-Louna Reserve in the south. Efforts have been made in the last few years to

deploy anti-poaching teams in the new national park, and in the south. Efforts have been made in the last few years to deploy anti-poaching teams in the new national park, and a wildlife survey (using line transects) was completed in 2020 for WWF by Paul N'Goran and colleagues, during which red colobus were encountered. The Ngombe logging concession will similarly be resurveyed in 2020. Further targeted survey work along rivers could help to determine the distribution of the species, and perhaps provide an idea of its numbers in both of these protected areas and also in the much larger area of the Ngombe logging concession and the undesignated swamp forests

Priority sites

| Country | Priority sites |
|---------|---|
| Congo | Ntokou-Pikounda National Park, Lesio-Louna Reserve, Ngombe logging concession |

Priority objectives and recommended actions

| Estimated budget* US\$ 70,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Maintenance of anti-poaching efforts | In (i) the Ngombe logging concession (ii) the Ntokou-Pikounda National Park and (iii) the Lesio-Louna Reserve (anti-poaching activities are currently ongoing at all three sites) |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | Surveys along the rivers of the Ntokou-Pikounda National Park, Lesio-Louna Reserve, and Ngombe logging concession |
| Maintain existing conservation education efforts | In (i) the Ngombe logging concession (ii) the Ntokou-Pikounda National Park and (iii) the Lesio-Louna Reserve |

*Excluding costs of long-term/recurring actions

OUSTALET'S RED COLOBUS

Piliocolobus oustaleti

Oustalet's red colobus ranges through DRC, Congo, the extreme southwest of the Central African Republic (CAR), and southern South Sudan. Despite its large range, this genetically, morphologically and ecologically variable taxon has declined over the past decade or more, and is expected to continue to do so.

However, Oustalet's red colobus is likely to be among the more numerous of the red colobus taxa, given the size of its range.¹¹⁶ No estimates of its population density are available, but it has been recorded as common on a number of large-scale surveys¹¹⁷⁻¹²⁰, and was among the most commonly recorded primates in surveys in the Okapi Wildlife Reserve (DRC) between 1993 and 2011.¹²¹⁻¹²³ The most recent survey data, however, show that its abundance has fallen slightly relative to other species.¹²⁴ Although Oustalet's red colobus still occur further east of the Okapi Wildlife Reserve in DRC, evidence from 2018 in the Mai Tatu area in the eastern Ituri forest and in the Albert Lake escarpment forest fragments, indicate they are one of the least commonly recorded primate species there.¹²⁵⁻¹²⁷ Camera traps and patrol reports have confirmed Oustalet's red colobus in the Bangangai and Bire Kpatuos Game Reserves, however local residents say that they are not common.^{128,129}

The primary threat to this species is hunting, including in areas of its range with low human population densities. The second most important threat is habitat loss and degradation, which primarily affect the northern and eastern edge of its range. The species appears to now be absent from a number of locations where it was historically recorded. Large areas of the species' range comprise areas of rapidly advancing deforestation and agricultural expansion.¹³⁰ Further loss, degradation and fragmentation of the species' range are anticipated.

Hunting, usually with shotguns, is a threat to Oustalet's red colobus in a number of areas, especially northern Congo and southwestern CAR outside the areas protected by wildlife guards. Although hunting used to be uncommon in the Ituri forest, it is now a growing threat in the Ituri landscape, both in the Okapi Wildlife Reserve¹²⁴ and the adjacent, unprotected Mai Tatu forest.^{127,131} Widespread hunting was recorded in the Abubumbazi Forest in the northwestern extreme of the species range in DRC, where no red colobus were recorded on a brief survey even two decades ago.¹³² In some areas, Oustalet's red colobus have been found exclusively in flooded forests, which likely serve as a refuge from hunting and logging.¹³³

The remaining largest populations of Oustalet's red colobus occur in national parks and reserves in DRC,

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Piliocolobus oustaleti. © Anne Laudisoit

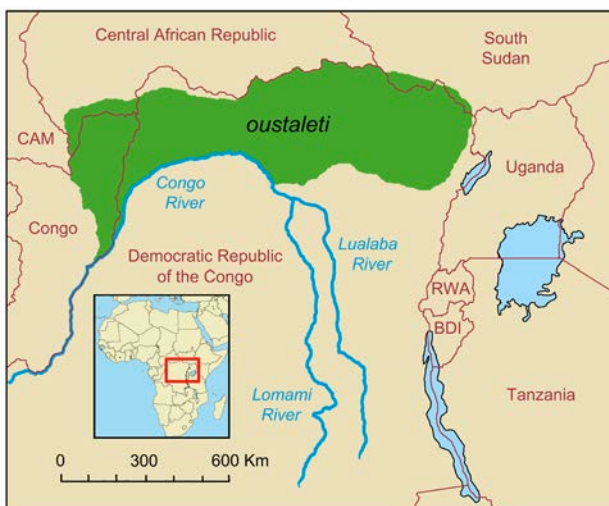


Fig. 11. *Piliocolobus oustaleti* distribution. Map by Stephen D. Nash

Congo, and CAR that protect large blocks of habitat and their buffer zones, which are managed in partnership with the conservation NGOs Wildlife Conservation Society and World Wide Fund for Nature. Protected areas and well-managed FSC logging concessions that effectively limit hunting are the most important mechanisms for protection

of this species. Land-use planning to ensure that remaining suitable habitat is not transformed to land cover types that would be uninhabitable by forest species (such as oil-palm plantations) is required, and road access by hunters needs to be kept to an absolute minimum where extractive industries exist (mainly logging concessions).

Priority sites

| Country | Priority sites |
|---------|---|
| DRC | Okapi Wildlife Reserve, Rubi-Télé Hunting Domain, Reserve Naturelle de Ngiri |
| Congo | Nouabalé-Ndoki National Park, and the surrounding logging concessions of Kabo, Pokola and Loundougou; Lac Télé Community Reserve and the swamps of the Bailly and Likouala-aux-Herbes |
| CAR | Dzanga-Ndoki National Park and Dzanga-Sangha Special Reserve, Mbaéré-Bodingué National Park (Ngotto Forest) |

Priority objectives and recommended actions

| Estimated budget* US\$ 210,000 | |
|---|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | <p>Surveys are needed across range areas that represent the known phenotypic, and presumably genetic, variation of this taxon, including populations in the centre of the range and on the periphery. Some specific sites that need surveying include (but are not limited to):</p> <ul style="list-style-type: none"> • Okapi Wildlife Reserve • Rubi-Télé Hunting Domain (DRC) and neighbouring forest • Swamp forests of the Dzanga-Ndoki National Park and Dzanga-Sangha Special Reserve • The Ubangi-Congo interfluvium in the Reserve Naturelle de Ngiri (DRC) • The small isolated forest blocks on the Lendu Plateau and gallery forests on the slopes dropping to the Lake Albert plane, including the Shari Reserve and the gallery forests in the Biringi-Aru landscape (DRC) |
| Strengthen protection and conservation | <p>Maintain anti-poaching efforts in (i) the Nouabalé-Ndoki National Park and the Lac Télé Community Reserve, and the FSC-managed logging concessions of Kabo, Loundougou, and Pokola in Congo (ii) the Okapi Wildlife Reserve and the Ngiri Natural Reserve in DRC and (iii) the Dzanga-Sangha Complex of Protected Areas in CAR</p> <p>Investigate the possibility of extending effective anti-poaching in the non-FSC logging concessions in the range of this taxon in DRC, and in the other protected areas where it occurs in DRC</p> <p>Include specific mention of red colobus in the existing education programmes around the priority sites to raise awareness of its importance and the vulnerability of this species and its habitat</p> <p>As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as “Tous <i>Ptilocolobes</i> (Colobes rouges)” or listing each species separately</p> |

*Excluding costs of long-term/recurring actions

TSHUAPA RED COLOBUS

Piliocolobus tholloni

The Tshuapa red colobus is endemic to DRC, with a range that covers most of DRC's central basin. Its areas of occupancy, however, are highly discontinuous and not well known. The range of this species is largely convergent with the range of DRC's endemic ape, the bonobo (*Pan paniscus*), with the exception of the Lomami–Lualaba interfluvium where this red colobus is absent. This species occurs – albeit now very rare – in the Sankuru Nature Reserve.^{125,134} It may also live south of the Sankuru/Kasai river, but this remains unconfirmed¹³⁵ and an expedition failed to find them in an area south of the Kasai around and south of Mangai.¹³⁶ Hunting has reduced population sizes and caused local extirpations in the Lac Tumba-Ledima Reserve¹³⁷, although they are still present in Malebo.¹³⁸ Tshuapa red colobus has not been recorded from the Lomako Yokokala Faunal Reserve^{139,140}, where large areas have very low human hunting pressure¹⁴¹, but it has long been known that although the species is present south of the Lomela River, it is absent between the Lomela and the Tshuapa¹⁴², one of the many river-determined distributions of red colobus across the continent. Hunters knew of their presence east of Lac Tumba in 2006.¹⁴³ Large populations of the species still occur in portions of the Salonga and Lomami National Parks. A survey in the Tumba-Ledima Reserve failed to record any red colobus monkeys.¹⁴⁴ Similarly, they were not recorded during surveys in Tumba-Ledima and they may have been locally extirpated.¹³⁶

The behaviour and ecology of the species is poorly known, studied only in Salonga National Park.^{145,146} No systematic survey has been conducted, but observations across the range suggest that the total population could exceed 30,000.

All red colobus are legally protected in DRC, yet communication of protected status and enforcement of hunting laws are largely insufficient. At present, all red colobus are completely protected under existing law under a catch-all term “Colobe bai, *Procolobus badius*”. The protected species list is currently under revision by the DRC government and the suggestions submitted to date include either “Tous *Piliocolobes* (Colobes rouges)” or listing each species separately. Proposals to declassify portions of the Salonga National Park for oil exploration could threaten significant populations of the Tshuapa red colobus, bonobos, and other wildlife, and should be closely monitored.

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Piliocolobus tholloni. © John A. Hart



Fig. 12. *Piliocolobus tholloni* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|---------|---|
| DRC | Salonga National Park, Lomami National Park |

Priority objectives and recommended actions

| Estimated budget* US\$ 140,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | <p>Surveys to assess presence/absence, relative abundance, and threats to red colobus in the following areas, paying particular attention to riversides:</p> <ul style="list-style-type: none"> • Buffer zone of the Lomami National Park • Lac Tumba-Ledima Reserve • Peatlands in the Lokolama/Mimia region and the Dekese and Lusambo Territories (both banks of the Lukenie River): the last survey here that confirmed the species' presence dates back to 2006¹⁴⁷ |
| Strengthen protection and conservation | Continue to run the existing biomonitoring programmes in the Salonga and Lomami national parks and regularly communicate results to the government and the IUCN SSC Primate Specialist Group |
| | As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as "Tous <i>Piliocolobes</i> (Colobes rouges)" or listing each species separately |
| | Improve enforcement of wildlife laws in areas where the species occurs |
| Raise awareness of conservation issues and strategies, with a focus on red colobus | Develop and implement anti-hunting education programmes focused on red colobus in key areas where presence is documented and habitat remains outside existing protected areas |
| | Continue the ongoing work with governmental and local authorities to ensure communication of DRC protected species legislation |
| Ecological research | Undertake ecological studies (ranging pattern, habitat use, and feeding ecology) of Tshuapa red colobus in the Lomami and Salonga national parks to determine distribution patterns and habitat preference and, as such, inform exploratory surveys |

*Excluding costs of long-term/recurring actions

LOMAMI RED COLOBUS

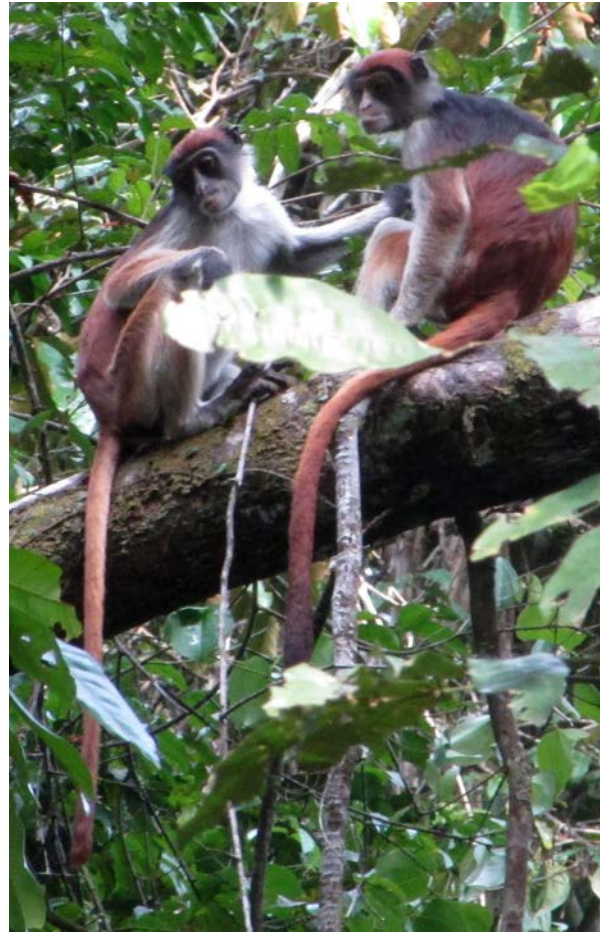
Piliocolobus parmentieri

The Lomami red colobus is a phenotypically stable, geographically and genetically distinct taxon endemic to the DRC.^{1,135,148} The Lomami red colobus and the Tshuapa red colobus are the only two red colobus to range in the DRC's forested central basin. The taxon was first described in 1987 from specimens collected over preceding decades.¹⁴⁹ The species' range, limited on the north and east by the Congo (Lualaba) River, and on the west by the Lomami River, has recently been extended south after sightings in the Lomami National Park.

The Lomami red colobus is threatened by uncontrolled hunting and habitat loss, accentuated by the proximity of the species' range to the urban centre of Kisangani, a hub for commercial bushmeat. Half of the species' known range has been degraded by or lost to shifting cultivation.¹⁵⁰ Populations of the Lomami red colobus have declined dramatically since its discovery, and in particular over the past two decades. The species was not found in surveys in 2007 in the forest north of Ubundu, the type specimen's location.¹⁵¹ It is rare or absent from large portions of the Lobaye basin, once considered the species' stronghold.¹⁴⁹



Piliocolobus parmentieri. © Lukuru Foundation



Piliocolobus parmentieri. © Lukuru Foundation

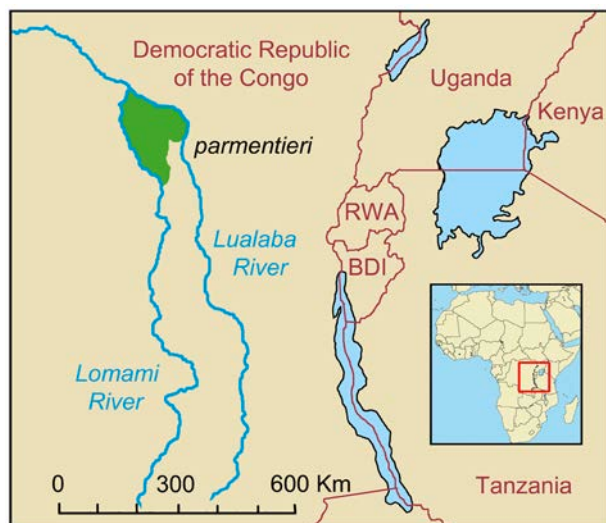


Fig. 13. *Piliocolobus parmentieri* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|---------|------------------------------------|
| DRC | Lomami National Park, Lobaye basin |

Priority objectives and recommended actions

| Estimated budget* US\$ 85,000 | |
|--|---|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | Conduct forest surveys in the southern portion of the range to elucidate area of occupancy and previously undocumented populations, with a particular emphasis on the Lomami National Park and buffer zone |
| | Survey Lobaye basin to determine the current status of the species |
| Strengthen protection and conservation | Implement a biomonitoring programme of red colobus monkeys for Lomami National Park and buffer zone and develop plans to communicate results to the government and the IUCN SSC Primate Specialist Group |
| | As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as “ <i>Tous Piliocolobes</i> (Colobes rouges)” or listing each species separately |
| | Improve enforcement of wildlife laws in areas where the species occurs |
| Engage with local government agencies and traditional leaders to promote red colobus conservation | Develop awareness campaigns in key locations where the species remains to apply wildlife and firearms laws that spare red colobus and other protected species |
| | Continue the ongoing work with governmental and local authorities to ensure communication and improve awareness of DRC protected species legislation |

*Excluding costs of long-term/recurring actions

EASTERN DEMOCRATIC REPUBLIC OF CONGO (DRC) RED COLOBUS

Four taxa of red colobus, collectively termed “Eastern DRC Red Colobus”, range primarily in the DRC, from the Congo (Lualaba) River in the west to the Albertine Rift highlands in the east, an area covering almost 200,000 km².

This vast zone includes rainforest blocks that contain some of the least known biological diversity in Africa because of a lack of recent and systematic biological surveys. The eastern DRC red colobus are: Kisangani red colobus (*Piliocolobus langi*), Ulindi red colobus (*Piliocolobus lulindicus*), Foa’s red colobus (*Piliocolobus foai*), and Semliki red colobus (*Piliocolobus semlikiensis*). Aside from a population of the Semliki red colobus found in western Uganda, these forms are restricted to eastern DRC.

Red colobus monkeys in this region show high levels of coat-colour variation between individuals, which has led to difficulties in identifying discrete taxonomic units. Colyn¹³⁵ proposed a biogeographic model for the eastern DRC red colobus that consisted of four distinct taxa at the peripheral extremes of this area: *foai* to the southeast; *lulindicus* to the southwest, *langi* to the northwest, and *semlikiensis* to the northeast. In between these four taxa exist some red colobus populations that represent a large hybrid swarm incorporating gene flow from these four forms (and possibly *oustaleti* to the north). We recognize these four taxa at the species level, and we place populations in the putative area of hybridization into the species with which they share the most similarities in coat colour. Some of these populations in the northern portion of the hybrid zone were formerly known as *P. ellioti* (Dollman, 1909)¹⁵² but they are here classified as *P. semlikiensis*. However, the boundaries between these Eastern DRC red colobus species are not discrete due to possible hybridization, making this classification tentative.

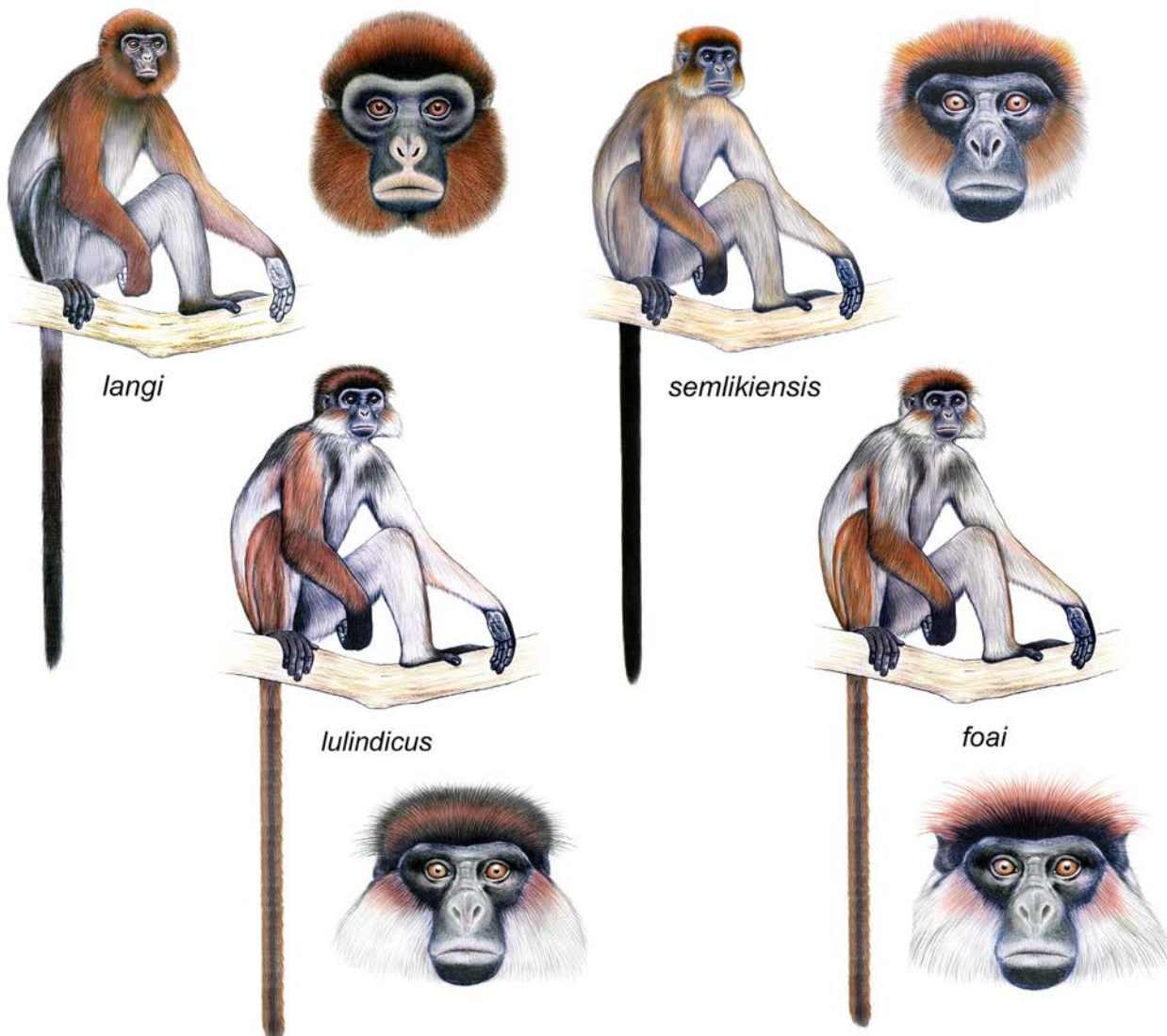


Fig. 14. The four Eastern DRC red colobus monkey species. Illustration by Stephen D. Nash



Fig. 15. Distribution of the four Eastern DRC red colobus monkey species. Map by Stephen D. Nash

Complex population histories are likely for all these taxa. Yet despite their poorly understood natural histories, these red colobus present a highly compelling case for conservation. Together, Eastern DRC red colobus occupy one of the largest remaining red colobus ranges. There are, however, few protected areas in the ranges of most forms. The potential for high levels of past and ongoing gene flow among populations raises the value of this region for conserving the genetic diversity of red colobus monkeys. The immediate conservation priorities for all of these taxa are to discover remaining populations and characterize these with photos and biological samples to determine conservation units. Where important populations occur, local campaigns are needed to promote their immediate protection from hunting.

This will require a coordinator, familiar with this region, to ensure that surveys at key locations are undertaken, analysed, and reported. A key responsibility will be to mobilize collaboration among field projects, and to deploy new field teams to gain a comprehensive picture of what populations remain of these red colobus and how they can be conserved.

KISANGANI RED COLOBUS

Piliocolobus langi

The Kisangani red colobus (also known as Lang's red colobus), endemic to DRC, has a grey posterior that is sharply delineated by the brick red anterior, a pattern shared with no other red colobus. The range of the Kisangani red colobus is centred on Kisangani, DRC's second largest city, and is bounded by the Aruwimi River to the north, and to the south by the Congo and Maiko rivers. The eastern limits are not well defined, and the Kisangani red colobus is purported to intergrade with the Semliki red colobus where the ranges of the two meet.¹³⁵ After not having been recorded in the field for eight years, a 2019 survey confirmed that the Kisangani red colobus occurs in a number of areas across its range, which totals 69,000 km². It still occurs in the northern Maiko National Park, at the southeastern limit of its range, where it was the most abundant of all primates observed during the first exploration of the park 30 years ago. This sector of the park has, however, not been patrolled for at least two decades due to the presence of rebels. The only other protected area in the range of this species is the Yangambi Biosphere Reserve but the presence of red colobus has yet to be confirmed there.

The Kisangani red colobus is endangered primarily by uncontrolled hunting, with habitat loss an increasing threat. Populations of Kisangani red colobus have been seriously reduced and, in some cases, probably extirpated. Illegal hunting threatens this species and most other fauna in all areas surveyed in 2019. Habitat loss and degradation from expanding agricultural conversion and logging affect populations around Kisangani, including much of the western third of the range. The widespread occurrence of artisanal mining for diamonds and gold over the eastern half of the range provides a base for hunters and demand for bushmeat in many areas, including the Maiko National Park. Population reductions associated with apparently widespread periodic epidemic die-offs are also a threat to this species.

Surveys across the range of this taxon to better understand its occurrence and abundance are a priority, particularly in the Yangambi Biosphere Reserve and former presumed strongholds such as the Tshopo basin.

It may be possible to control illegal killing of red colobus and other endangered fauna at a local level by dedicated projects that involve engagement with local authorities and communities. Conservation initiatives focusing on areas in the eastern part of the Kisangani red colobus range could also be fruitful, as there exist low rates of human immigration and large blocks of suitable and intact habitat with shifting agriculture localized around settlements.

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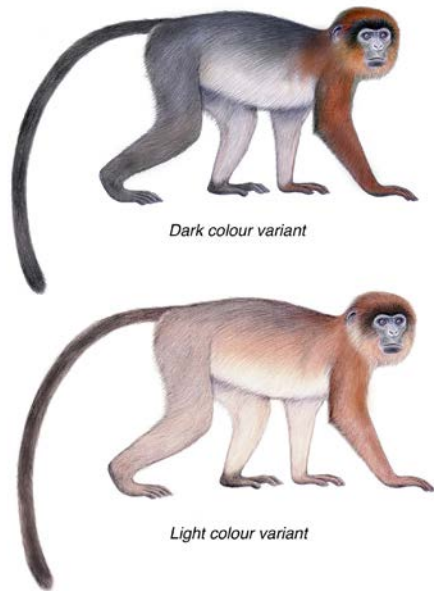


Fig. 16. *Piliocolobus langi*. © Desire Kaisala-FZS TL2, illustration by Stephen D. Nash

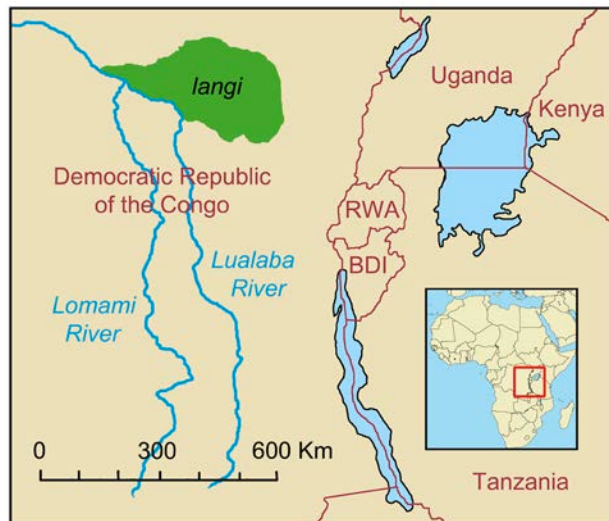


Fig. 17. *Piliocolobus langi* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|---------|---|
| DRC | Maiko National Park, Yangambi Biosphere Reserve |

Priority objectives and recommended actions

| Estimated budget* US\$ 83,000 | |
|--|---|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, and threats to red colobus | Conduct rapid assessment surveys in the Yangambi Biosphere Reserve |
| | Conduct rapid assessment surveys in four forest blocks (upper Aruwimi, Lindi, Tshopo, and Maiko basins) in the eastern portion of the range |
| | Collect faecal samples of red colobus monkeys during forest surveys and conduct genetic analysis to elucidate conservation units |
| Engage with local government agencies and traditional leaders to promote red colobus conservation | Develop awareness campaigns in Kisangani and other key locations in the range of the Kisangani red colobus to highlight wildlife laws and the importance of the red colobus and their habitats |
| | Continue the ongoing work with governmental and local authorities to ensure communication of DRC protected species legislation |
| Strengthen protection and conservation | As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as " <i>Tous Piliocolobes</i> (Colobes rouges)" or listing each species separately |
| | Improve enforcement of wildlife laws in areas where the species occurs |

*Excluding costs of long-term/recurring actions

ULINDI RED COLOBUS

Piliocolobus lulindicus

The Ulindi red colobus is endemic to DRC. Following Colyn¹³⁵, we recognize this as a distinct taxon, but at the species level, and we include putative hybrid populations that occur in the lowland forests between the pure *lulindicus* and *foai* forms. Thus, the range of the Ulindi red colobus as defined here is estimated at 95,000 km², extending from the Lowa and Lubutu rivers in the north (where it may intergrade with the Semliki red colobus), to the limits of contiguous forest at about 6°S. At its western limits, the range is bounded by the upper Congo (Lualaba) River. From there it is distributed east through the lowland forests of the Lowa, Lubutu, Ulindi and Elila basins. The eastern limits of the Ulindi red colobus are the submontane forests of the Albertine Rift, where it presumably intergrades with Foa's red colobus. The Ulindi red colobus varies in pelage colouration across its habitat. Red forms dominate south of the Elila River; whereas forms with both red and black colouration are prevalent to the north.¹³⁵ Colyn¹³⁵ suggested that populations of the Ulindi red colobus are discontinuous across their range.

Over the past 30 years, there has been an approximately 15% loss in forest cover across the Ulindi red colobus range, and that figure is expected to increase given current rates of forest loss and fragmentation.

Human population growth has caused an expansion of shifting agriculture and habitat loss around important mining centres such as Kalima, Pangi, Punia and Lubutu. The Ulindi red colobus has seen population declines or extirpation in over 70% of assessed forest blocks covering the western half of its range. It is also likely extirpated in parts of the eastern half of its range, including Kahuzi-Biega National Park, which was a stronghold for the species in the 1990s.¹⁵³ Commercial bushmeat hunting, in particular that associated with artisanal mining, poses the largest threat to the Ulindi red colobus. There are no established protected areas in this species' remaining range, which includes some of the least surveyed remaining large forest blocks in eastern DRC. Preliminary surveys conducted in 2018 identified several important populations in the Ulindi and Elila basins, at the western limits of the range.¹³² Nevertheless, the Ulindi red colobus is among DRC's least known and least protected red colobus.

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Fig. 18. *Piliocolobus lulindicus*. illustration by Stephen D. Nash

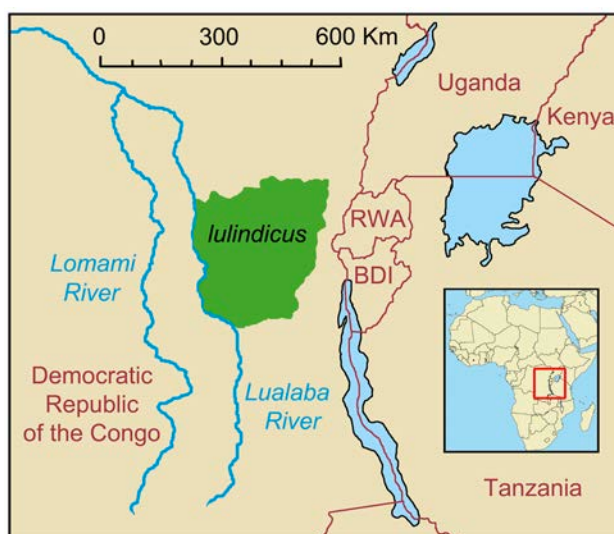


Fig. 19. *Piliocolobus lulindicus* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|---------|--|
| DRC | Western Ulindi and Elila basins (territories of Punia, Kalima, Kailo, and Kasongo) |

Priority objectives and recommended actions

| Estimated budget* US\$ 124,000 | |
|---|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, threats to red colobus | Survey western Ulindi and Elila basins (territories of Punia, Kalima, Kailo, and Kasongo) and collect georeferenced photographs of red colobus monkeys to help elucidate taxonomic identity in areas where 2018 rapid assessments indicated extant populations remain and in forest fragments south of the contiguous forest block |
| | Collect faecal samples of red colobus monkeys during forest surveys and conduct genetic analysis to elucidate conservation units |
| Increase formal protection of red colobus and its habitats | Develop and implement proposals for protected areas in the range |
| | Improve enforcement of wildlife laws in areas where the species occurs |
| | Collaborate with local administrators and traditional leaders to investigate the possibility of establishing formal community-based conservation areas |
| | Collaborate with conservation NGOs in the region working on great apes to incorporate red colobus into survey, monitoring and conservation activities |
| | Continue the ongoing work with governmental and local authorities to ensure communication of DRC protected species legislation |
| | As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as “ <i>Tous Piliocolobes</i> (Colobes rouges)” or listing each species separately |
| Raise awareness of conservation issues and strategies | Develop and implement anti-poaching education programmes focused on red colobus in key areas where presence is documented and habitat remains |

*Excluding costs of long-term/recurring actions

FOA'S RED COLOBUS

Piliocolobus foai

Foa's red colobus is endemic to DRC. Historically, it ranged from the source of the Lukuga River, Lake Tanganyika, in the south, through the montane forests of the Kabobo and Itombwe massifs west of Lake Tanganyika, and through the upland sector of Kahuzi-Biega National Park, west of Lake Kivu. In the north it likely intergrades with the Semliki red colobus, and the species' eastern limits are defined by the limits of montane forest formations of the Albertine Rift. To the west, the species intergrades with populations of Ulindi red colobus at the limits of lowland forest formations between 1,000 m and 1,500 m.¹⁵⁴ Foa's red colobus is currently known to occur only in two locations: 1) the Itombwe Nature Reserve and 2) the Kabobo and Ngandja Natural Reserves and adjacent Luama-Katanga Hunting Reserve (together comprising the Kabobo massif protected area complex). However, it is extremely rare in Itombwe, having only one recorded sighting in the past 20 years after several sightings in 1996¹⁵⁵, and although hunters claimed it was still present in 2015¹⁵⁶, its continued persistence is doubtful due to uncontrolled hunting. This animal was first thought to have been extirpated from the highlands of Kahuzi-Biega National Park in the late 1990s¹⁵⁷, and this was confirmed by surveys in 2015.^{158,159} If the Itombwe population is lost, then the range of Foa's red colobus will be reduced to 1,200 km². The most important remaining populations are likely those in the Kabobo and Ngandja Natural Reserves.^{160,161}

The primary threat to Foa's red colobus is habitat loss as montane forests are degraded or lost by expanding agriculture, artisanal mining, and conversion to pastureland. Hunting is also a threat throughout its range.

While establishment of the Kabobo massif protected area complex has contributed significantly to the conservation of this species, human populations are currently increasing in this area. Hunting and habitat degradation from artisanal mining are threats in particular in the Luama Hunting Reserve. The species has been in decline, even in protected areas where it was known historically, and this decline is expected to continue across its remaining range.

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Piliocolobus foai. © Andrew J. Plumptre

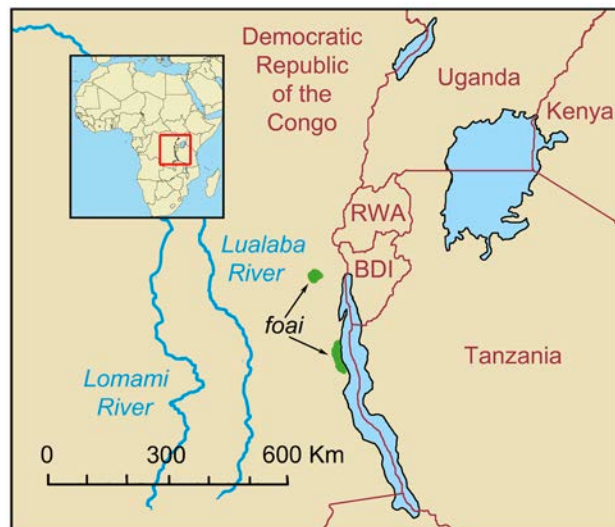


Fig. 20. *Piliocolobus foai* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|---------|--|
| DRC | Kabobo massif protected area complex, particularly Kabobo and Ngandja Natural Reserves |

Priority objectives and recommended actions

| Estimated budget* US\$ 55,000 | |
|---|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, threats to red colobus | Itombwe Nature Reserve |
| | Kabobo massif landscape |
| | Collect georeferenced photographs and faecal samples of red colobus monkeys during forest surveys and conduct genetic analysis to elucidate taxonomic identity and conservation units |
| Strengthen protection and conservation | Establish a red colobus (and large mammal) monitoring programme in the Kabobo massif |
| | As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as “Tous <i>Piliocolobes</i> (Colobes rouges)” or listing each species separately |
| | Improve enforcement of wildlife laws in areas where the species occurs |

*Excluding costs of long-term/recurring actions

SEMLIKI RED COLOBUS

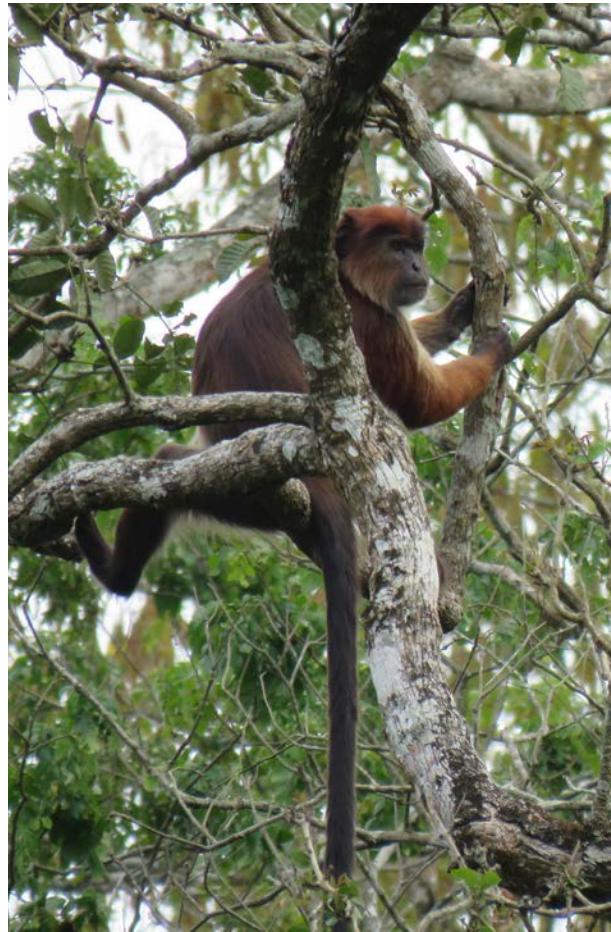
Piliocolobus semlikiensis

The Semliki red colobus, as defined here, includes the restricted-range population originally described by Colyn¹³⁵, as well as populations that reside in a large area of putative hybridization with *P. langi*, *P. lulindicus*, *P. foai*, and possibly *P. oustaleti*. The geographic range of this animal is thus quite large at 54,000 km². The southern limit of the Semliki red colobus is roughly 1° S, comprising the Lowa River (to the southwest) and further east, its tributary, the Oso River. The northern limit is roughly 1.2° N, comprising the Ituri River (at the northeastern edge of the range of this taxon), which in turn becomes the Aruwimi River further west, which completes the northern limit. The eastern limit is the Albertine Rift, in the northern part of Virunga National Park with an extension into Semuliki National Park in western Uganda. The western limit is unclear as the populations in this area may be hybrids, but it can be described as a very rough north-south line at about 27.9° E that veers to the southwest. Existing protected areas in this described range include the Virunga National Park, Maiko National Park, Semuliki National Park, Okapi Wildlife Reserve, Tayna Nature Reserve, Kisimba Ikobo Primate Nature Reserve, and Mt. Hoyo Reserve. Based on a limited number of recorded sightings and vocalizations over the past 20 years, this species may be present at most of these localities, albeit at very low levels of abundance.

The range of the Semliki red colobus was originally an extremely large area of intact forest that has become increasingly fragmented, creating easy access into once remote forests. The entire range is seriously impacted by deforestation via shifting agriculture, as well as commercial hunting associated in some areas with artisanal mining. In the past 30 years, analysis of forest cover has shown that 12–14% of the forest across the Semliki red colobus range has been lost. The area east of the Biena River has been an active settlement frontier with major deforestation for the past three decades, and habitat in and around Virunga National Park and Mt. Hoyo is highly threatened. Surveys conducted in the past 20 years across this species' range have commonly found signs of hunting pressure and have indicated that population declines have been going on for some time and will continue into the foreseeable future.

Surveys and monitoring across protected areas are an immediate priority, particularly where insecurity is not a problem. Any remaining populations outside established protected areas are vulnerable to habitat loss, in particular, gallery forest populations in savannas occupied by grazers where forests are vulnerable to burning.

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Piliocolobus semlikiensis. © Harriet Kemigisha

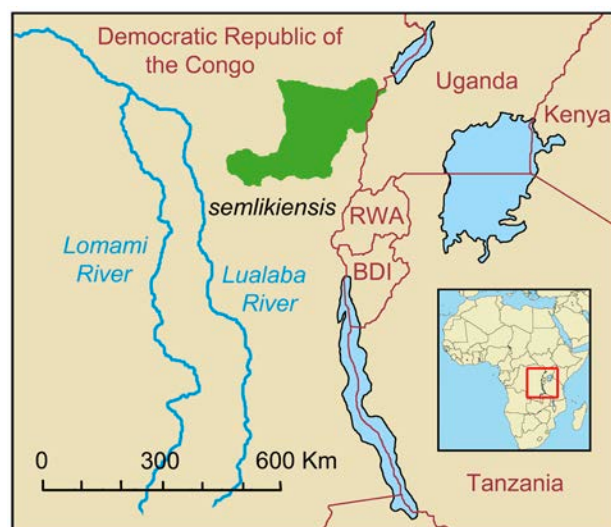


Fig. 21. *Piliocolobus semlikiensis* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|---------|--|
| DRC | Virunga National Park, Maiko National Park, Mt. Hoyo Reserve, Tayna Nature Reserve, Kisimba Ikobo Primate Nature Reserve, Okapi Wildlife Reserve |
| Uganda | Semuliki National Park |

Priority objectives and recommended actions

| Estimated budget* US\$ 430,000 | |
|---|--|
| Priority objectives | Recommended actions |
| Surveys to assess presence/absence, relative abundance, threats to red colobus | Conduct surveys in all protected areas (Watalinga/Semliki forest in Virunga National Park, Maiko National Park, Semuliki National Park, Mt. Hoyo Reserve and surrounding island/gallery forests, Tayna Nature Reserve, Kisimba Ikobo Primate Nature Reserve, and the Okapi Wildlife Reserve) |
| | Conduct surveys in remaining forested areas of the Biena and Ituri basins within this taxon's range as well as in western Uganda |
| | Conduct interviews with local people living in and around the protected areas to assess historical occurrence and relative abundance |
| | Collect georeferenced photographs and faecal samples of red colobus monkeys during surveys and conduct genetic analysis to elucidate taxonomic identity and conservation units |
| Strengthen protection and conservation | Collaborate with conservation NGOs in the region working on great apes to incorporate red colobus into survey, monitoring, and conservation activities |
| | Continue the ongoing work with governmental and local authorities to ensure communication of DRC protected species legislation |
| | As for all other DRC red colobus, work with the existing efforts to ensure all red colobus species figure on the new DRC protected species list either as " <i>Tous Piliocolobes</i> (Colobes rouges)" or listing each species separately |
| | Improve enforcement of wildlife laws in areas where the species occurs |
| Build local capacity and engage with local communities to increase their participation in red colobus conservation | Establish a laboratory in Kindu in collaboration with the University of Mapon to process biological samples for genetic analysis |
| | Develop and implement anti-hunting education programmes focused on red colobus in key areas where their presence is documented and habitat remains |

*Excluding costs of long-term/recurring actions

ASHY RED COLOBUS

Piliocolobus tephrosceles

The Ashy red colobus has a highly fragmented distribution in western Uganda and western Tanzania, across the eastern border of the Albertine Rift. Five distinct populations are thought to exist: 1) western Uganda in Kibale National Park, and in western Tanzania in 2) Biharamulo on the southwestern shores of Lake Victoria, 3) Gombe National Park, 4) Mahale Mountains National Park on the eastern shores of Lake Tanganyika, and 5) Mbizi and Chala forests on the Ufipa Plateau^{162,163} and maybe along the escarpment between the Ufipa Plateau and Lake Rukwa. This species occurs in a wide variety of forest types, including riparian and gallery forest, forest-miombo savanna mosaic, old-growth lowland, mid-altitude, and montane moist rainforest and *Euphorbia* cloud forest, degraded secondary forests, and regenerating forest.^{7,116,163-165} However, it has been extirpated in nearly all forest fragments surrounding Kibale National Park^{7,165} and in some forests on the Ufipa Plateau.¹⁶³ Total population size for the Ashy red colobus is greater than 25,000 individuals and is thought to be stable. However, this status is largely due to a few relatively well-protected red colobus populations in national parks that contain long-term field research sites. Outside these areas, the Ashy red colobus population may be in decline, as is certainly the case in the forests on the Ufipa Plateau of southwest Tanzania.

Multiple protected areas exist in the Ashy red colobus range, including Kibale National Park and Gombe National Park, where the earliest red colobus studies were conducted in the 1970s. Kibale National Park, where long-term research has provided one of the most thorough windows into red colobus behaviour, ecology, diet, genetics, and disease^{7,166-170}, contains the vast majority of individuals of this species (20,000+ individuals) and represents the most viable population. Overall, recent surveys have shown that this population is stable as group sizes increase and regenerating forest colonizes new areas. This has countered dramatically declining encounter rates in the middle of the park due to chimpanzee predation as well as the extirpation of red colobus in most fragments outside the park.^{7,165,171,172} At Gombe National Park, the population is also thought to be stable despite chimpanzee predation.^{173,174} On the Ufipa Plateau, poor forest protection has led to forest loss, extirpation of red colobus from some forests, and precipitous declines in populations in other forests.¹⁶³ Total red colobus population sizes are unknown in the Greater Mahale Ecosystem (including Mahale Mountains National Park), although encounter rates have been relatively stable.^{175,176} Very little is known about the population inhabiting the Biharamulo Game Reserve, or whether this animal even persists there.

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Piliocolobus tephrosceles. © Jessica Rothman

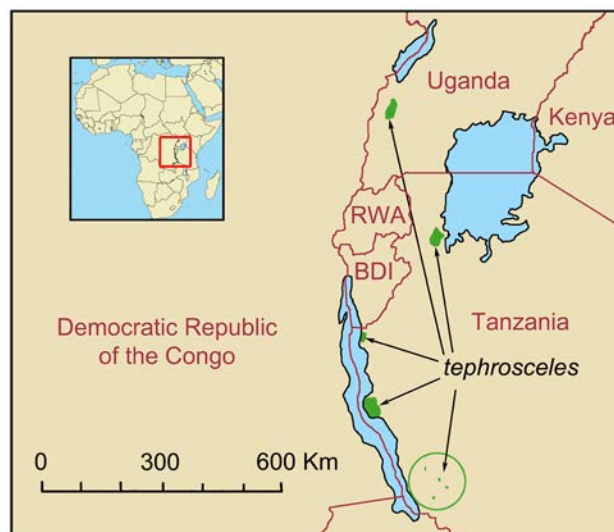


Fig. 22. *Piliocolobus tephrosceles* distribution. Map by Stephen D. Nash

The greatest threat to the Ashy red colobus is habitat loss due to growing human populations and associated activities such as agriculture, timber, charcoal, building poles, and burning. Hunting is likely an issue across sites as well. While the total number of Ashy red colobus is large relative to some other red colobus taxa, each population has a limited distribution and is completely isolated from others with little or no possibility for future connectivity. The long-term outlook for this species is mostly dependant on the population inhabiting Kibale National Park. If conditions were to deteriorate there, the future of the Ashy red colobus would become very uncertain.

Priority sites

| Country | Priority sites |
|----------|---|
| Uganda | Kibale National Park |
| Tanzania | Mahale Mountains National Park, Gombe National Park |

Priority objectives and recommended actions

| Estimated budget* US\$ 65,000 | |
|--|--|
| Priority objectives | Recommended actions |
| Surveys to assess red colobus presence/absence, relative abundance, and threats | Biharamulo Game Reserve |
| | Workshop to coordinate ongoing primate surveys in the Greater Gombe-Masito-Ugalla Biosphere Reserve and the Greater Mahale Ecosystem in order to focus efforts on red colobus and standardize collection and sharing of data |
| Strengthen protection and conservation | Increase number of park guards and patrol coverage, implement regular guard-training workshops, and upgrade guard equipment |
| | Extend the protected area on Ufipa Plateau to include parts of the escarpment below to the northeast |
| | Elevate Mbizi Forest to a Nature Reserve |
| Engage with local communities to improve education and awareness of red colobus conservation issues | Initiate and/or expand existing education and awareness programmes to increase community participation in forest conservation |
| | Workshops to coordinate education and awareness programs at priority sites |

*Excluding costs of long-term/recurring actions

TANA RIVER RED COLOBUS

*Piliocolobus rufomitratu*s

The Tana River red colobus is endemic to Kenya, occurring along the Lower Tana River and in the Tana Delta on the northern coast of Kenya. It is restricted to c. 34 patches of riparian and floodplain forest that range in size from 1 ha to 500 ha. The area of forest it occupies is extremely small (likely <10 km² in 2016) and severely fragmented. Much of the original forest has been destroyed and most of what remains is degraded, some of it severely.^{177,178} Initial population estimates for the Tana River red colobus in the 1970s ranged from 1,200–4,300.^{179–181} The total population was estimated at 1,100–1,300 individuals in 1994¹⁷⁷ and 1,000 individuals in 2003.²⁴ There is a continuing decline in the area of forest it occupies as well as the total area across which it is found. Habitat quality and the number of mature individuals are also expected to further decline.^{24,182–184}

There exists only one protected area in the range of the Tana River red colobus – the Tana River Primate National Reserve (TRPNR). Besides the Tana River red colobus, the TRPNR supports the Critically Endangered Tana River mangabey (*Cercocebus galeritus*) and six other primate species. The TRPNR is one of the seven richest sites for primate species in East Africa and the most important site in Kenya.¹⁸⁵ The current status of the TRPNR, however, remains uncertain following a court ruling in 2007 that the reserve should be degazetted because it was established without proper engagement of the local community. This has yet to happen since the Kenya Wildlife Act of 2012 states that degazettement of any protected area must be done by the cabinet secretary through an act of parliament, which has yet to be introduced. Thus, the *status quo* remains and the TRPNR is managed in collaboration with the Kenya Wildlife Service as community (mostly Baomo) land. The Ndera Community Conservancy, established in 2010 to improve community development and conservation efforts, is committed to protecting the monkeys and is actively conserving the southern part of the TRPNR and some areas outside the TRPNR boundaries.¹⁸⁶ However, about 63% of the red colobus groups occur outside the TRPNR where there is otherwise little protection for the monkeys or their habitats from the activities of the rapidly growing human population.^{24,76,177}

A variety of factors have led to the decline of the Tana River red colobus. Drastic changes in vegetation due to construction of several large dams up-river and irrigation projects have considerably altered river flow volume and are expected to have continued adverse effects on the forests of the Lower Tana River and Tana Delta.^{76,184,187,188} Unsustainable subsistence agriculture

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*Piliocolobus rufomitratu*s. © Yvonne de Jong and Thomas Butynski, wildsolutions.nl

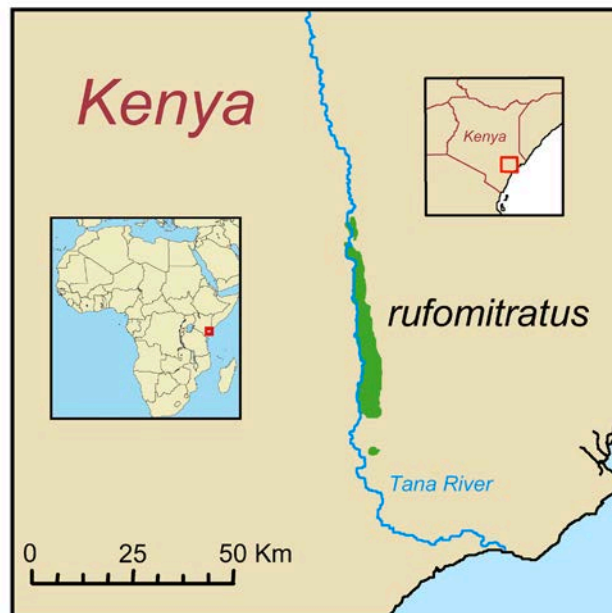


Fig. 23. *Piliocolobus rufomitratu*s distribution. Map by Stephen D. Nash

and small-scale harvesting of forest resources have led to forest degradation, fragmentation, and loss. Other threats include fires, spread of invasive plants, habitat destruction by elephants, killing due to association with other primate species that raid crops, shifting climatic conditions that have led to livestock grazing in red colobus habitat, and civil unrest.^{24,76,116,177,178,184,185,189–191}

Because all remaining forests inhabited by the Tana River red colobus are small and seriously threatened, and although the population is genetically viable¹⁹², the long-term survival of this species seems bleak without concerted efforts to improve the effectiveness of legally-protected conservation areas, restore degraded habitats,

facilitate more research and monitoring, and conduct surveys to reassess population status, distribution, and habitat quality. These activities could inform the development of a national conservation and management plan for the Tana River red colobus.

Priority sites

| Country | Priority sites |
|---------|--|
| Kenya | Tana River Primate National Reserve, Ndera Community Conservancy, the proposed Gwano Community Conservancy |

Priority objectives and recommended actions

| Estimated budget* US\$ 78,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Improve formal protection of red colobus and its habitats | Hire, train, and deploy guards to protect red colobus and their habitats in the Ndera Community Conservancy and proposed Gwano Community Conservancy |
| | Establish tree nurseries of indigenous species to restore degraded red colobus habitat areas and create and monitor forest corridors to connect forest fragments |
| | Establish community forest associations to regulate forest resources and police illegal activities in the forests outside the TRPNR |
| Reduce pressure on red colobus habitats from surrounding human communities | Improve community support for conservation and reduce exploitation of riparian forests where red colobus occur, assess the likely effectiveness (including positive and negative impacts) of expanding existing schemes (e.g., small-scale irrigation projects), and pilot new approaches (e.g., energy efficient cooking technologies, planting of woodlots) |
| Improve research infrastructure | Rehabilitate the Mchelelo Research Camp to support research on red colobus monkeys and promote an eventual ecotourism programme |
| Improve education and awareness-raising of red colobus conservation issues | Assess local perceptions and knowledge of red colobus monkeys and their habitat |
| | Implement education and awareness programmes that focus on red colobus and other primates as well as forest conservation and management |
| Surveys to assess red colobus populations and habitat change | Conduct surveys to assess red colobus population size and distribution and to evaluate habitat change and presence of plant species |

*Excluding costs of long-term/recurring actions

UDZUNGWA RED COLOBUS

Piliocolobus gordonorum

The Udzungwa red colobus is endemic to southern central Tanzania where it is found in the Udzungwa Mountains, which have remarkably high vertebrate diversity and contain the largest remaining forests in the Eastern Arc mountain chain. This red colobus is found in miombo woodlands and the moist lowland and montane forests of this region, including the Udzungwa Mountains National Park (1,990 km²) and several adjacent forests, many of which have nature or forest reserve status.

The total population size for this species is thought to be 30,000–40,000 individuals, the majority of which reside in the national park, and it occurs at higher densities in low elevation forests compared to high elevation forests.¹⁹³⁻¹⁹⁶ Some of the small lowland forests in the Kilombero Valley outside the national park have, however, been severely degraded or completely lost in recent decades.¹⁹³ As a result, red colobus monkeys have been extirpated from a number of forest patches along the eastern base of the Udzungwa Mountains, where the only remaining viable population is in Magombera Forest.^{7,27} The presence of red colobus in several gallery forests along tributaries of the Kilombero River has not been assessed recently¹⁹⁴, although it is unlikely that these patches hold viable numbers given recent agricultural intensification. Other forests in the Udzungwa Mountains with red colobus monkeys are found on mountain slopes and contain a mixture of lowland deciduous, lowland semi-deciduous, and montane evergreen forest. They vary widely in size and level of protection.

Trends in the Udzungwa red colobus population are available for two forests over the time period of 2002–2016.^{197,198} In the Mwanihana Forest, which is well protected and within the national park boundaries, population sizes were found to be fairly stable. However, in the Udzungwa Scarp Nature Reserve, which has high levels of human disturbance due to insufficient law enforcement, red colobus monkeys declined to near extinction during this period. The primary reason for this population decline was a combination of targeted subsistence hunting and habitat degradation due to small-scale logging and harvesting of timber resources.

Other threats to the Udzungwa red colobus across its distribution include subsistence and commercial agricultural expansion, small-scale livestock farming and ranching, and development of human settlements, roads, and railways. While some populations of this species remain well-protected in large forest blocks, others face a precarious future and are becoming increasingly isolated due to fire impact on the landscape that maintains forest boundaries. Action is thus needed to secure threatened subpopulations and encourage connectivity among the forest blocks.¹⁹⁹

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Piliocolobus gordonorum. © Thomas T. Struhsaker



Piliocolobus gordonorum. © Raffaele Merler



Fig. 24. *Piliocolobus gordonorum* distribution. Map by Stephen D. Nash

Priority sites

| Country | Priority sites |
|----------|--|
| Tanzania | Udzungwa Mountains National Park, Uzungwa Scarp Nature Reserve, Kilombero Nature Reserve, Magombera Forest |

Priority objectives and recommended actions

| Estimated budget* US\$ 63,000 | |
|--|--|
| Priority objectives | Recommended actions |
| Strengthen protection and conservation in protected areas | Standardise scientifically robust monitoring methods to periodically assess primate (especially red colobus) populations and human threats |
| | Improve protection effectiveness in the Uzungwa Scarp and Kilombero nature reserves by patrolling them and implementing regular guard-training workshops |
| Reforest key priority areas | Reforest lowland forest areas of Udzungwa National Park, Uzungwa Scarp Nature Reserve, Kilombero Nature Reserve and the wildlife corridor linking the forests of Magombera and Mwanihana |
| | Establish a protocol to monitor and protect the proposed Magombera-Mwanihana wildlife corridor |
| Community engagement | Integrate conservation education and awareness programmes into existing community-based operations in and around the priority sites centred on forest importance, red colobus monkeys, wood cutting, and hunting |
| | Engage with the Tanzania Renewable Energy Association and other relevant NGOs to explore the possibility of integrating the use of fuel-efficient stoves, solar panels, and charcoal alternatives into existing community-based activities |

*Excluding costs of long-term/recurring actions

ZANZIBAR RED COLOBUS

Piliocolobus kirkii

The Zanzibar red colobus has long been recognised as the most distinct of all red colobus monkeys. It has a highly restricted distribution and is endemic to Unguja Island in the Zanzibar Archipelago of Tanzania, where it is limited to lowland areas. The largest subpopulation (c. 2,900 individuals) resides in the middle of the island in the Jozani-Chwaka Bay National Park (50 km²). Other subpopulations are scattered across the island in forest reserves and unprotected areas. Some 31% of them live outside protected areas and are severely threatened. While some subpopulations may use plantations, mangroves or shambas (areas of cultivation), 85% of the population exists in or adjacent to forests, with the largest forests containing bigger groups.²⁰⁰

The overall Zanzibar red colobus habitat is severely fragmented, and many subpopulations exist in complete isolation. This animal has already disappeared from many forests on Unguja Island, and it probably occurred on the mainland in the recent past. There also exists a translocated population on nearby Pemba Island that numbers approximately 35–40 individuals²⁰¹, but this population is likely to be removed due to its limited genetic variability and 'exotic' nature.²⁶ A recent Unguja island-wide complete census for this animal estimated a total population of 5,862 individuals.²⁰⁰

Historically, the Zanzibar red colobus has been viewed as one of the most threatened primates in Africa. In the 19th and early 20th centuries, it was described as very rare and on the verge of extinction. Population estimates from the late 20th century placed the total number of individuals in the range of 1,000–2,400. However, a recent census placed the total population size much higher. The reasons for this discrepancy are complex and linked to historical forest cover fluctuations (19th century clearance for cloves, for example) and previous figures being based on isolated and extrapolated density estimates rather than complete counts.²⁰⁰ Despite this seemingly positive development, the Zanzibar red colobus remains very rare and threatened.

Forest loss continues at 1.1% per annum due to unmanaged development for tourism and housing, human population growth and agricultural expansion. Climate change is also expected to have a major impact on Unguja as most of the island is low lying, and forests and agricultural lands are already affected by changes in sea level, water salination, patterns of precipitation, and soil quality. Local people hunt red colobus for meat and because the red colobus is viewed by many as an agricultural pest. The recent complete census also demonstrated very low survivorship and recruitment

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Piliocolobus kirkii. © Thomas T. Struhsaker



Piliocolobus kirkii. © Tim Davenport

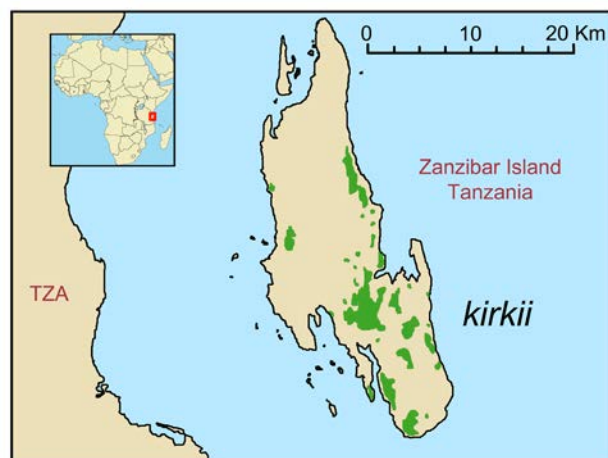


Fig. 25. *Piliocolobus kirkii* distribution. Map by Stephen D. Nash

across the island, indicating habitat loss and stress, and a bleak conservation prognosis.²⁰⁰ It is probable that the Zanzibar red colobus groups and individuals residing outside protected areas will not survive in the long term as their habitat continues to be lost.

Priority sites

| Country | Priority sites |
|----------|---|
| Tanzania | Jozani-Chwaka Bay National Park, Southern Uzi and Vundwe Islands, Mchamgamle, Kiwengwa Forest Reserve |

Priority objectives and recommended actions

| Estimated budget* US\$ 116,000 | |
|---|---|
| Priority objectives | Recommended actions |
| Strengthen protection and conservation in and around protected areas | Gazettement and management of a new protected area that encompasses Southern Uzi, Vundwe, and Mchamgamle (the proposed “Nongwe-Pengeleni-Vundwe Forest Reserve”) |
| | Improve protection effectiveness in Jozani-Chwaka Bay National Park and Kiwengwa Forest Reserve by increasing the number of guards patrolling those areas and patrol coverage, implementing regular guard training, and increased community support |
| | Monitor populations in protected areas to evaluate long-term trends in population size, demography and viability, as well as any negative impacts arising from climate change, tourism and human activities |
| | Habituate more groups of red colobus outside Jozani-Chwaka Bay National Park (especially in Kiwengwa Forest Reserve, Masingini Forest Reserve, Vundwe, or the Jambiani–Muyuni Forest Reserve) to increase tourism potential and revenue |
| | Assess land use, forest loss, and habitat change across the island in order to prioritize and identify conservation management units among subpopulations |
| Improve education and awareness-raising of red colobus conservation issues | Collaborate with the Revolutionary Government of Zanzibar to adopt the Zanzibar red colobus as the official national animal, thereby making it a flagship species |
| | Implement conservation education programmes in local schools to raise awareness of the conservation status and value of the Zanzibar red colobus and instil appreciation for links to forest health and human well-being |
| Monitor primate diseases linked (but not limited) to human proximity | Develop a program that will assess and monitor the presence of disease as well as the impact of disease on red colobus health. |

*Excluding costs of long-term/recurring actions



Piliocolobus pennantii. © Rich Bergl

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Piliocolobus rufomitratu. © Stanislaus Kivai

APPENDIX: SUMMARY BUDGET FOR TAXON-BASED RECOMMENDED ACTIONS

The table below presents the estimated overall budget for smaller-scale recommended actions for each taxon. These budgets do not include estimates for the long-term, recurrent, or intangible recommended actions, which, as noted in the plan, are difficult to estimate, and would likely exceed US\$ 17 million across all red colobus taxa over five years. A detailed list of the taxon-based recommended actions identified in this action plan and associated budgets can be downloaded from:

http://www.primate-sg.org/action_plans

<https://www.redcolobusnetwork.org/actionplan>

Table 3. Estimated overall budget

| Taxon | Scientific name | Budget (US\$) |
|----------------------------|-----------------------------|------------------|
| Temminck's red colobus | <i>P. badius temminckii</i> | 329,000 |
| Bay colobus | <i>P. badius badius</i> | 97,000 |
| Miss Waldron's red colobus | <i>P. waldroni</i> | 30,000 |
| Niger Delta red colobus | <i>P. epieni</i> | 130,000 |
| Pennant's red colobus | <i>P. pennantii</i> | 160,000 |
| Preuss's red colobus | <i>P. preussi</i> | 172,000 |
| Bouvier's red colobus | <i>P. bouvieri</i> | 70,000 |
| Oustalet's red colobus | <i>P. oustaleti</i> | 210,000 |
| Tshuapa red colobus | <i>P. tholloni</i> | 140,000 |
| Lomami red colobus | <i>P. parmentieri</i> | 85,000 |
| Kisangani red colobus | <i>P. langi</i> | 83,000 |
| Ulindi red colobus | <i>P. lulindicus</i> | 124,000 |
| Foa's red colobus | <i>P. foai</i> | 55,000 |
| Semliki red colobus | <i>P. semlikiensis</i> | 430,000 |
| Ashy red colobus | <i>P. tephrosceles</i> | 65,000 |
| Tana River red colobus | <i>P. rufomitratu</i> | 78,000 |
| Udzungwa red colobus | <i>P. gordonorum</i> | 63,000 |
| Zanzibar red colobus | <i>P. kirkii</i> | 116,000 |
| TOTAL | | 2,437,000 |



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