Detailed Final Report

Your Details	
Full Name	MAMA Sadam
Project Title	Biomonitoring and conservation of White-thighed Colobus (*Colobus vellerosus*) in the Kikélé Sacred Forest
Application ID	43710-2
Date of this Report	11/06/2025

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Estimate the current population size of *C. vellerosus* in the Kikélé Sacred Forest (KSF) using camera traps				To ensure the suitability of the method and an accurate assessment of the population size of *C. vellerosus* in the KSF, we used the classic method most commonly applied in primate surveys using camera traps (Alempijevic et al., 2022; Niu et al., 2022; Fox-Rosales et al., 2024). Prior to the installation of the cameras, a survey was carried out in the forest with members of the KSF management committee to identify the parts of the forest where the species is often observed and the areas where the cameras should be installed to increase the probability of detection. The camera traps were then programmed before being deployed in the field. They were positioned on trees approximately 1 m from the ground (Photo 1) and on tree trunks approximately 10 m (Photo 2) above the ground, facing branches potentially connected to neighboring trees. The camera traps were programmed to record 60-second high-quality videos continuously over a 24-hour period, using high sensitivity and a 1-second rest interval (Photo 3). They were also set to take three photos per trigger to provide good images for activity reporting. The camera traps were deployed in the forest over a four-month period in order to gather sufficient data and obtain a more accurate estimate of the species' population. The cameras were checked every four weeks to assess their functionality and to replace batteries and memory cards.
Characterize the habitats of *C.*				A forest inventory was conducted in the KSF to determine the floristic composition and species diversity of the different

Objective	Not achieved	Partially achieved	Fully achieved	Comments
vellerosus in the KSF				habitats of *C. vellerosus*. During the installation of the plots, observed anthropogenic activities were systematically recorded to assess threats to the *C. vellerosus* population and its habitats. The abundance of fruit-bearing species in the forest was also assessed. A total of 30 plots were established across the plant communities of the KSF. The minimum plot size was 10 m × 10 m for the herbaceous layer and 30 m × 30 m for the arboreal layer. Plots were established using a simple random sampling method. The floristic inventory involved identifying all plant species present in each plot. Each species was assigned an abundance-dominance coefficient according to Braun-Blanquet's method (1932). To ensure the reliability of species identification, herbarium specimens were collected in the field and verified by qualified botanists in the laboratory.
Develop awareness and environmental education programs on the conservation of threatened species and their habitats.				Six awareness sessions were organized for the Kikélé population and residents of nearby villages located in unprotected riparian areas, where displacement of the species is frequently observed. Following a presentation of the research findings, participants were sensitized to the importance of nonhuman primates and the ecological and cultural value of the KSF for surrounding communities. Discussions also addressed potential zoonotic risks linked to open defecation in the forest, as well as the harmful impacts of heavy waste dumping. Posters (Photo 4), T-shirts with key messages, and picture boxes were used to visually support the awareness messages. During these meetings, particular emphasis was placed on the fact that *C. vellerosus* is not a source of protein, but rather a cultural heritage

Objective	Not achieved	Partially achieved	Fully achieved	Comments
				that must be preserved by the Kikélé community. Additionally, at least ten environmental education sessions were organized in primary and secondary schools in Kikélé and neighboring villages. Picture boxes were produced and distributed to children. Games, drawing activities, and educational competitions focusing on C. *vellerosus*, zoonotic diseases, and environmental pollution were also held for schoolchildren.

Photo 1. Camera trap installed 1 m above the ground in the KSF.

Photo 2. Camera trap installed 10 m above the ground in the KSF.

Photo 3. Camera trap programming.

Photo 4. Poster designed for awareness and environmental education.

2. Describe the three most important outcomes of your project

a). Estimating the current population size of *C. vellerosus* in the KSF using camera traps

Camera traps installed at several strategic sites within the KSF identified 35 individuals of *C. vellerosus*, distributed across three groups: Group 1 (6 individuals), Group 2 (18 individuals), and Group 3 (11 individuals) (Photos 5). The identified individuals appear to frequent mainly the peripheral areas of the forest, particularly the eastern zone near human settlements. In these areas, group sizes ranged from 6 to 35 individuals, compared to only 0 to 6 individuals observed in the central part of the forest. The video footage captured by the cameras revealed intraspecific competition within the groups. Adult males were seen engaging in conflicts for access to females, while younger individuals were sometimes chased away by adults during feeding activities.

Photo 5. Captures of *C. vellerosus* in the KSF from August 2024, February 2025, and March 2025.

b). Characterization of the habitats of *C. vellerosus* in the KSF

A total of 54 plant species belonging to 33 families were recorded in the 10 plots surveyed during the field activities (Table 1). The most dominant families were Combretaceae, Fabaceae, and Rubiaceae. A hierarchical cluster analysis conducted using a matrix of the 10 relevés identified three vegetation groups:

-G1: Vegetation group dominated by *Azadirachta indica*, *Holoptelea grandis*, and *Cola gigantea*, comprising three plots from dense forest;

-G2: Vegetation group dominated by *Terminalia leiocarpa, Cassia sp*., and *Azadirachta indica*, comprising five plots from dense forest and forest galleries;

-G3: Vegetation group dominated by *Piliostigma thonningii* and *Daniellia oliveri*, comprising two plots from open forests.

Group 3 had the highest species richness with 25 species, indicating greater species diversity compared to Groups 1 and 2, which had 22 and 25 species respectively. However, Groups 1 and 3 had lower Shannon diversity indices than Group 2, suggesting a more even distribution of species in Group 2. Overall, Group 2 exhibited the highest species richness and diversity, suggesting a relatively rich and diverse ecosystem.

Table 1.

Scientific Name	Familly	Statut UICN
Adansonia digitata	Bombacaceae	NE
Anacardium occidentale	Anacardiaceae	LC
Anchomanes difformis	Araceae	LC
Anona senegalensis	Annonaceae	LC
Anthocleista grandiflora	Gentianaceae	NE
Azadirachta indica	Meliaceae	LC
Blighia sapida	Sapîndaceae	LC
Bombax costatum	Bombacaceae	LC
Burkea africana	Fabaceae	LC
Caesalpinia pulcherrima	Fabaceae	LC
Cassia sp	Mimosacées	LC
Celtis zenkeri	Ulmaceae	LC
Chromolaena odorata	Asteraceae	NE
Cissus populnea	Vitaceae	NE
Clerodendrum capitatum	Lamiaceae	LC
Cola cordifolia	Sterculiaceae	LC
cola gigantea	Sterculiaceae	LC
Combretum sp	Combretaceae	NE
Combretum tomentosum	Combretaceae	LC
Crossopteryx febrifuga	Rubiaceae	LC
Cussonia aborea	Araliaceae	LC
Daniellia oliveri	Fabaceae	LC
Diospyros mespiliformis	Ebeneceae	LC
Elaeis guineensis	Arecaceae	LC
Ficus capensis	Moraceae	LC
Ficus thonningii	Moraceae	LC
Ficus vogelii	Moraceae	NE
Haematostaphis barteri	Anacardiaceae	NE
Holarrhena floribunda	Apocynaceae	LC
Holoptelea grandis	Verbanaceae	LC
Hymenocardia acida	Phyllanthaceae	LC
Khaya grandifoliola	Meliaceae	VU
Khaya senegalensis	Meliaceae	VU
Malacantha alnifolia	Sapotaceae	NE
Mangifera indica	Anacardiaceae	DD
Maranthes polyandra	Chrysobalanaceae	LC
Neocarya macrophyla	Chrysobalanceae	NE
Opilia celtidifolia	Opiliaceae	NE
Parkia biglobosa	L. Mimosoideae	LC
Piliostigma thonningii	Fabaceae	LC
Prosopis africana	Fabaceae	LC

Pteleopsis suberosa	Combretaceae	LC
Pterocarpus erinaceus	Leguminosae – Papilionoideae	EN
Sacrocephalus lactifolius	Rubiaceae	LC
Stereospermum kinthianum	Bignoniaceae	LC
Tamarindus indica	L. Detarioideae	LC
Terminalia avicennioides	Combretaceae	LC
Terminalia leiocapa	Combretaceae	LC
Uapaca togoensis	Euphorbiaceae	LC
Vernonia colorata	Asteraceae	LC
Vitellaria paradoxa	Sapotaceae	VU
Vitex doniania	Verbanaceae	LC
Zanthoxylum zanthoxyloides	Rubiaceae	LC

c). Awareness and environmental education

We organized six awareness sessions with a total of 180 participants from the Kikélé community and neighboring villages located in unprotected riparian areas. Among these participants, 85% demonstrated, during post-session discussions, an improved understanding of the ecological and cultural role of *C. vellerosus* and the dangers associated with hunting the species. Approximately 98% of participants acknowledged that the species should no longer be seen as a source of meat, but rather as a cultural heritage to be preserved.

After the awareness sessions, participants were trained in agroforestry and nursery techniques. A community nursery was established on a secured site of approximately 400 m², and seedlings of *Afzelia africana*, *Khaya senegalensis, Gliricidia sepium*, and *Albizia lebbeck* were produced. The seedlings were planted in degraded habitats (1,000 seedlings) and in the fields of volunteer farmers living near the forest (2,000 seedlings). The post-training evaluation showed that at least 85% of participants had mastered the techniques taught.

We also conducted ten environmental education sessions in five primary and secondary schools in Kikélé and surrounding villages, directly reaching over 550 schoolchildren (Photos 6 and 7). Picture boxes were produced and distributed to each school (one per institution). The games, drawing activities, and educational competitions organized during these sessions resulted in a 90% active participation rate. During oral and visual evaluations conducted after the activities, 85% of the children were able to correctly identify *C. vellerosus*, name at least two threats to the species, and explain the importance of the forest in preventing zoonotic diseases. Over 300 posters and 300 T-shirts were distributed, ensuring continued visibility of conservation messages within the communities.

In addition, interviews conducted with members of the local forest management committee (Photo 8) helped identify key challenges, particularly the lack of surveillance resources (mentioned by 100% of respondents) and low youth involvement. Following these discussions, three concrete measures were proposed: the revitalization of vision-based ecotourism, the training and support of community eco-guards, and the establishment of environmental clubs in schools.

Photo 6. Schoolchildren environmental education 1.

Photo 7. Schoolchildren environmental education 2.

Photo 8. Discussion with members of the KSF management committee.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

No unforeseen difficulties arose during the implementation of the project. All planned activities were carried out as scheduled, and community collaboration remained strong throughout the process.

4. Describe the involvement of local communities and how they have benefitted from the project.

Local communities were actively involved in all phases of the project. They participated in the installation and monitoring of camera traps, forest inventory, identification of degraded habitats, establishment and maintenance of a nursery, reforestation, as well as awareness raising and environmental education. Community members also served as local guides during camera trap installation and supported forest inventories. The forest management committee and the Kikélé Endogenous Cults Association collaborated on awareness efforts and shared their cultural knowledge about *C. vellerosus*. Reforestation was carried out in partnership with the Bassila Forestry Office. Additionally, awareness and environmental education activities were organized with the NGOs SOS Savane and *Numérique, Éducation et Développement Durable* (NEDD). The community also gained visibility through posters, T-shirts, and local radio engagement. Discussions with the management committee led to the joint development of solutions, including the revitalization of ecotourism and the creation of environmental clubs, thereby strengthening local ownership and long-term impact.

5. Are there any plans to continue this work?

Yes, actions are planned to continue and strengthen the achievements of the project. We are seeking additional funding to expand reforestation efforts through agroforestry systems. Collaboration with schools will continue through the creation of environmental clubs led by teachers and students. In addition, partnerships with local NGOs and the forest management committee will be reinforced to promote ecotourism and develop a sustainable conservation strategy based on community engagement and habitat preservation.

6. How do you plan to share the results of your work with others?

The project results will be shared with all our partners and published in an indexed, open-access journal. A summary report will be submitted to local authorities, community leaders, partner NGOs, and the schools involved. Scientific findings will be submitted to peer-reviewed journals and presented at relevant conferences and workshops. At the community level, posters and school activities helped to convey key messages. Visual content, such as photo reports and short videos, was produced and shared on the digital platforms of our partners to strengthen awareness. These materials will also be disseminated through partner platforms to reach a wider audience and enhance conservation outreach for *C. vellerosus*.

7. Looking ahead, what do you feel are the important next steps?

Looking ahead, important next steps include securing additional funding to scale up agroforestry-based reforestation and strengthen long-term habitat restoration. Establishing and supporting environmental clubs in schools will be essential for

maintaining youth engagement and education. We also plan to formalize and strengthen partnerships with local NGOs, community leaders, and forest management authorities to develop a community-led conservation strategy. Promoting eco-tourism based on the cultural and ecological value of *C. vellerosus* and improving forest surveillance through the training of local eco-guards will help sustain conservation efforts. Finally, expanding scientific monitoring will support data-driven decision-making and track progress over time.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes, The Rufford Foundation's logo was used on all materials produced during the project, including posters and t-shirts. The Foundation was acknowledged as the main sponsor during all awareness and environmental education sessions, as well as in meetings with local authorities and partners. Its support was also highlighted in social media publications and in local radio broadcasts covering the project's progress. This helped to increase visibility of the Foundation's role in supporting community-based conservation efforts in Benin. We will also acknowledge The Rufford Foundation's support in the scientific article currently being prepared for publication in an open-access peer-reviewed journal.

9. Provide a full list of all the members of your team and their role in the project.

- Sadam MAMA, MSc

Project Coordinator. He supervised all project activities, ensured the timeline was respected, and managed the budget limits.

- Laurent G. HOUESSOU (PhD), Associate Professor

His expertise made a significant contribution to the wildlife counting and forest inventory protocol, as well as to the processes of restoring degraded habitats.

- Agbatan Marc KOUTCHORO, MSc

He participated in the forest inventory, data analysis, awareness and environmental education, and farmer training.

- Sylvain DEVOEHO, BSc

She participated in the installation and monitoring of camera traps.

- Salomon TOLOHIN, MSc

All camera trap data were processed and analyzed under his direct supervision.

- ADC Gafarou IDRISSOU

Head of the Manigri Forest Post (Bassila), Representative of the Benin Forestry Office in the project.

- Ganiou OLABISSI

Representative of the Eco-guards and local communities in the project.

10. Any other comments?

We would like to sincerely thank The Rufford Foundation for their generous financial support, which made this project possible. We also extend our gratitude to all our partners, including the Bassila Forestry Office, SOS Savane NGO, Numérique, Éducation et Développement Durable (NEDD) NGO, the local communities, school authorities, and the team at the LEB Laboratory of the University of Parakou. Their invaluable collaboration and commitment were essential to the successful implementation and impact of our work.