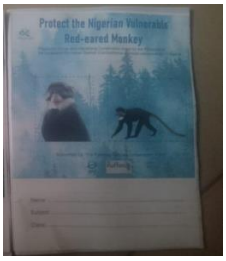

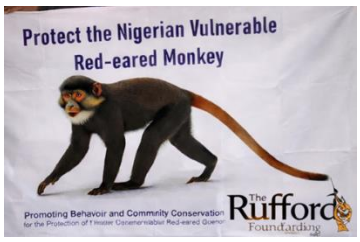

Mid-report
Prepared for Rufford small grants for nature conservation project (Grant no: 44582-1)
on

Population Survey and Intensifying Conservation Action for the Protection of the Vulnerable Red-eared Monkey (*Cercopithecus erythrotis camerunensis*) in Nigeria.

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1.0 Introduction

The red-eared monkey (*Cercopithecus erythrotis camerunensis*) has a highly restricted distribution on the African mainland, occurring from south of the Sanaga River in Cameroon to southeastern Nigeria, including Afi Mountain Wildlife Sanctuary (AMWS) and Cross River National Park (CRNP). Field and hunting surveys conducted in 2018 within CRNP and surrounding support-zone communities recorded extremely limited evidence of the species' presence, with only a single carcass encountered, despite the detection of several other primate species. This pattern is consistent with the cryptic and shy behavior of the red-eared monkey (Ayoola et al., 2019), but it also highlights the potential impact of intensified human activities within the landscape. Multiple studies (Butynski and Kingdon, 2013; Linder and Oates, 2011; Ajonina et al., 2014) document escalating threats to the red-eared monkey, particularly from indiscriminate hunting and habitat disturbance, which have contributed to marked population declines across its range. Although the species is currently classified as *Vulnerable* by the IUCN, information on its conservation status, ecology, and population distribution in Nigeria remains sparse. Ongoing human pressures within its Nigerian range continue to pose a serious risk of local extinction. Given the species' limited distribution, small population size, and heightened vulnerability to anthropogenic threats, strengthened conservation actions grounded in research, outreach, and stakeholder engagement remain critical. The outcomes of this project directly contribute to safeguarding the remaining populations of the red-eared monkey and its associated habitats in Nigeria, with particular emphasis on CRNP.

1.1 Objectives

1. This study focuses on the red-eared monkey population within Cross River National Park (CRNP), which represents the largest remaining distribution range for the species in Nigeria. Despite CRNP's high biodiversity value, persistent human activities continue to threaten habitat integrity and species survival. The objectives below frame the scope and contributions of the work conducted
2. Species reassessment and threat evaluation: The study evaluates the current distribution of the Vulnerable red-eared monkey within CRNP and identifies both existing and emerging threats affecting its survival, with the aim of informing improved habitat management strategies.
3. Habitat suitability and conservation prioritization: Using Species Distribution Modeling in combination with field survey data, the study identifies suitable habitats and potential distribution patterns to delineate conservation priority areas. The integration of empirical data and spatial models supports evidence-based conservation planning for the species within CRNP.
4. Conservation education and community engagement: The project strengthens conservation education through outreach activities in schools and local communities surrounding the study area, increasing awareness of the ecological importance of the red-eared monkey and the need for its protection.
5. Stakeholder engagement and conservation planning: Engagement with park management and local stakeholders supports dialogue on conservation challenges and informs the development of a species-specific conservation action plan for the red-eared monkey in CRNP.

2.0 Methodology

2.1 Study Area

Cross River National Park (CRNP) is one of the oldest remaining rainforest ecosystems in Africa and is internationally recognized for its exceptional biodiversity and species richness. The park is located in Cross River State, southern Nigeria, and covers an area of over 4,000 km². CRNP comprises two administrative

divisions: the Oban Division and the Okwangwo Division. Field activities and assessments are focused within both divisions of CRNP. In Nigeria, the red-eared monkey (*Cercopithecus erythrotis camerunensis*) is endemic to CRNP and Afi Mountain Wildlife Sanctuary, with CRNP supporting the largest remaining distribution range for the species. Given the species' restricted range and conservation status, strengthening habitat protection and management within CRNP remains a priority for its long-term survival.

2.2 Data Collection

2.2.1 Primate surveys are based on recce sampling methods (Walsh & White, 1999) combined with opportunistic observations, which are effective for identifying key habitats and occurrence areas of C. e. camerunensis (van Krunkelsven et al., 2000; Kühl et al., 2008). Survey efforts are aligned with daily activity periods between 04:00–11:00 and 15:00–19:00, reflecting the species' behavioral ecology, insights from previous studies (Oates, 2011), and local ecological knowledge from park rangers and surrounding communities. Species identification follows established morphological criteria described by Oates (2011). Binoculars are used to facilitate the detection and identification of individuals within forest strata. For each primate encounter, key observational data, including date, time, group size, and distance from observer are systematically recorded. Geographic coordinates are collected at each occurrence point using a handheld GPS unit to support spatial mapping and modeling analyses. Evidence of anthropogenic threats, such as hunting activity, habitat disturbance, and human presence, is also documented alongside species records.

2.2.2 Community-based conservation activities focus on strengthening awareness and local stewardship for red-eared monkey conservation. Conservation education programmes target schools within communities surrounding CRNP, reaching approximately 200 students during this initial field work, with the aim of reaching at least 100 students across 2–3 institutions before the end of the project. Educational activities emphasize sustainability, threats to primates, and the ecological importance of the red-eared monkey. Broader community outreach engages residents through visits to social gatherings, cluster groups, and public meeting spaces, particularly during evening periods when participation is highest. Interactive discussions, quizzes, and social activities are used to encourage engagement, with programming centered on the theme of "Primate Conservation and Awareness."

2.2.3 Stakeholder engagement emphasizes collaboration with park authorities and local communities to strengthen conservation outcomes. Engagement begins with coordination meetings involving CRNP management and ranger teams responsible for site protection and enforcement. These discussions inform subsequent engagement with community leaders, educators, and women's groups to address conservation challenges and priorities. Joint sessions with community representatives and CRNP volunteers support the development of a species-specific conservation action framework, emphasizing local participation, long-term monitoring, and sustainable management strategies for the red-eared monkey within CRNP.

2.2.4 As part of a comprehensive approach, we aim to combine this data with field survey distribution data to model both current and future distributions, along with the ecological needs of C. e. camerunensis, integrating the most effective predictive environmental variables (ENV), including non-climatic factors. For this analysis, the Maximum Entropy approach (Phillips et al., 2006; Scheldeman and Zonneveld, 2010) will be used to assess habitat suitability. By understating the primary factors driving the predictive species distribution models (SDM) and mapping the potential shifts in habitat distribution, our findings will guide proactive conservation efforts for C. e. camerunensis in the face of ongoing global environmental changes.

3.0 Results

Based on findings from our previous study and the initial reconnaissance surveys, red-eared monkeys were confirmed in the Oban Division of Cross River National Park at Okoroba and Nsan villages in Akamkpa

Local Government Area, Cross River State. Similarly, within the Okwangwo Division, the species was recorded in Balegete I and II, as well as the Anape community. Consequently, survey efforts during this phase of the project were deliberately focused on these confirmed localities to address logistical constraints and to maximize the efficient use of limited resources. Given the large spatial extent of Cross River National Park and the challenging field conditions, concentrating survey activities in known occupancy areas allowed for targeted data collection, improved detection probability, and more effective allocation of time, personnel, and equipment.

3.1 **OBAN DIVISION-Okoroba Community**

Okoroba community is a relatively small community whose populace depends mainly on farming for their survival. The community consists of about 25 to 30 houses built mainly from mud. The people residing in the community are mainly elderly people above 45 and youths between ages 20 and 40. There were very few people between ages 4 to 19. The reason given for this was the lack of primary and secondary schools in the community. So, when the children are of school age, they are sent to neighboring communities like Nsan and sometimes as far as Akampka town. Okoroba community forest is not under the control of the Cross River National Park, it is strictly a community forest with no form of legal protection.

3.1.1 Fieldwork/Activity

A. Camera trap placement

A total of five camera traps were placed in different locations of the forest. The placement was in three location, Ayakuwaba axis (2 camera traps), tractor road axis (2 camera traps) and the community reserve axis (1 camera trap). These areas were chosen because they were most likely to have the presence of our target species (Red Eared monkey) and other primate species. This conclusion was drawn from the reconnaissance survey earlier carried out.

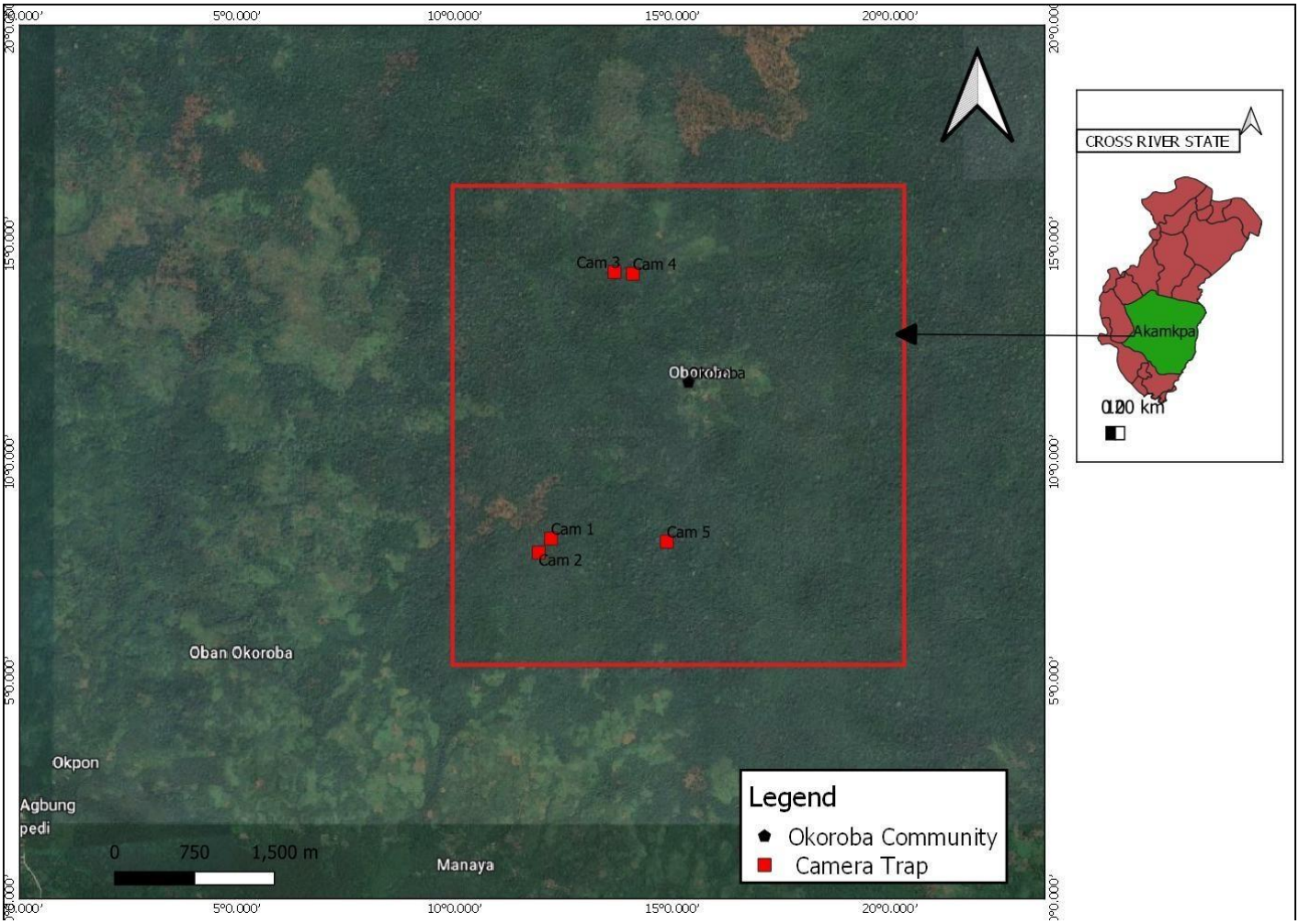

Figure 1: Map showing the location of camera traps

Table 1: Camera Trap Placement

S/N	Camera Trap Label	Latitude	Longitude	Elevation (m)
1.	Okoroba – Cam 1	N05.155074	E008.446573	107
2.	Okoroba – Cam 2	N05.153885	E008.445529	104
3.	Okoroba – Cam 3	N05.177674	E008.451936	103
4.	Okoroba – Cam 4	N05.177533	E008.453486	110
5.	Okoroba – Cam 5	N05.154827	E008.456380	94

B. Recce surveys

Recce surveys was also carried out in these areas within this period, in the morning (6:30 – 11:30am) and evenings (3:30 pm – 6:30pm). The recce survey followed established trails and water courses in the search of the target species. Survey was carried out for a period of 3 days covering about 13.8km within the forest.

Table 2: Primate Species observed

S/N	Primate Species	GPS Coordinates	Remark
1.	Putty nosed monkey	N05.177481 E008.453446	Calls -
2.	Drill monkey	N05.155472 E008.447697	Feeding activities (Bush mango), broken tree branches,
3.	Red Eared monkey	N05.177789 E008.453180	2 individuals sighted

C. Threat Indicators observed

Okoroba community is not under any form of legal protection. This is likely responsible for the pervasive threats to primate species. The threat indicators recorded include the following;

1. Farming
2. Logging
3. Wire traps
4. Spent cartridge

Figure 2: Plate 1: Camera trap placement Plate 2: Taking GPS Coordinates

Figure 3: Plate 3: Feeding signs by Drill monkey Plate 4: Wire trap

Figure 4: Plate 5: Evidence of hunting Cartridge Plate 6: Logging evidence

3.2 Okwangwo – Cross River National Park and Anape Community Forest

3.2.1 Fieldwork/Activity

A. Camera trap placement

A total of four camera traps were placed in different locations of the forest. The placement was in GSM mountain forest, Anape community forest, Pear tree road forest and Camp 3 road forest. These areas were chosen because they were more likely to have the presence of our target species (Red Eared monkey) and other primate species. This conclusion was drawn from the reconnaissance survey earlier carried out. The fifth camera trap was not deployed because the Duracell batteries available did not seem to work for it. This camera trap was then later deployed on the Belegette axis of the forest.

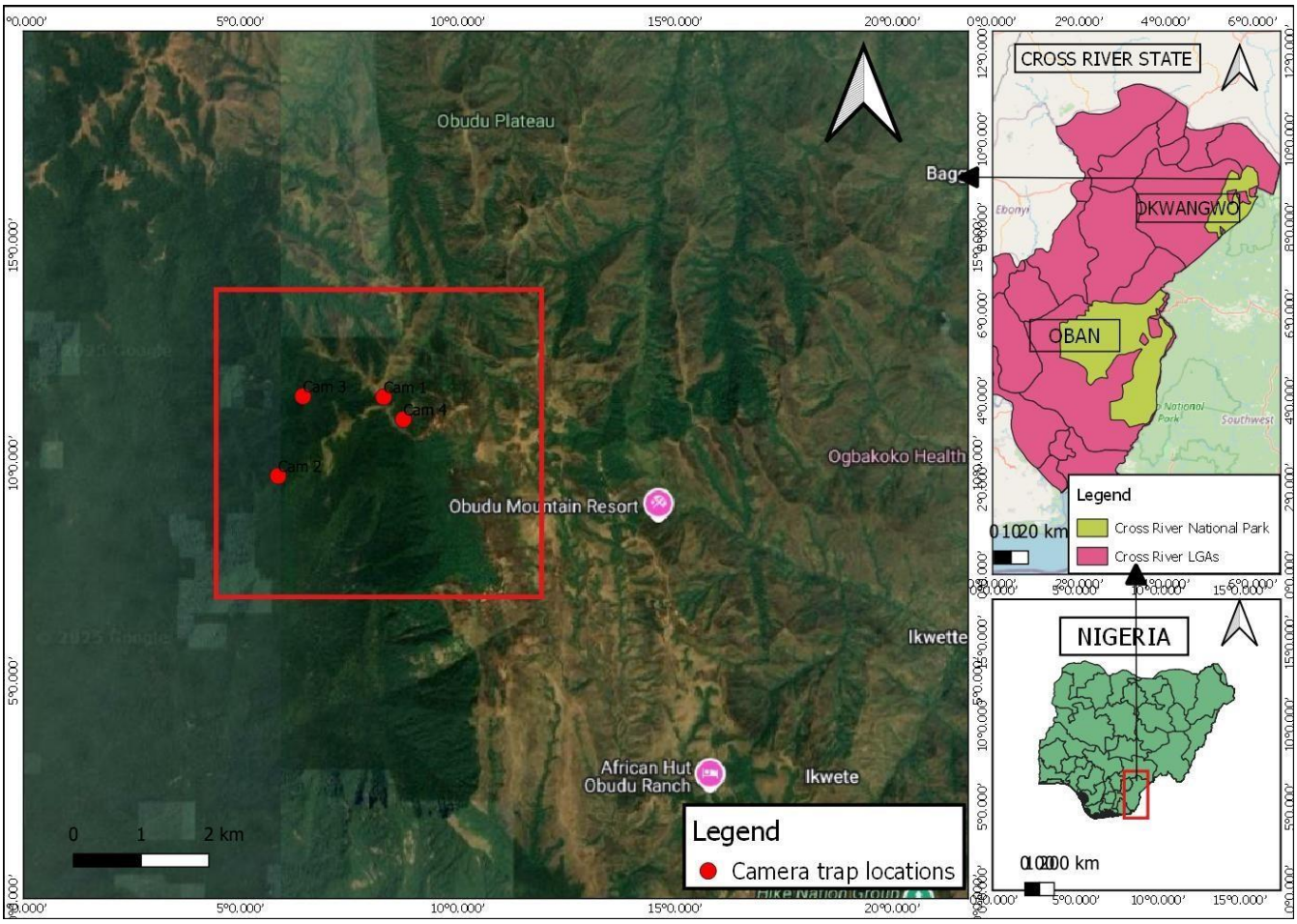

Figure 5: Map showing location of camera traps

Table 3: Camera Trap Placement

S/N	Camera Trap Label	Latitude	Longitude	Elevation (m)
1.	GSM Mountain Forest – Cam 1	N06.433403	E009.329919	1560
2.	Camp 3 Road Forest– Cam 2	N06.422864	E009.315827	1300
3.	Pear Tree Road Forest – Cam 3	N06.433895	E009.319146	1391
4.	Anape Community Forest – Cam 4	N06.430406	E009.332556	1582

B. **Recce surveys**

Recce surveys was also carried out in these areas within this period, in the morning (6:30 – 11:30am) and evenings (3:30 pm – 6:30pm) during which the Red Eared monkey and other diurnal primates are most active. The recce survey followed established trails and water courses in the search of the target species. We surveyed these areas for a period of 5 days, covering a distance of 31.7km within the forest.

Table 4: Primate Species Observed

S/N	Primate species	Latitude	Longitude	Remark
1.	Putty nosed monkey	N06.424478	E009.318776	Call
2.	ID uncertain	N06.427885	E009.320612	Suspected primate feeding signs (fruits)
3	Putty nosed monkey	N06.432750	E009.324161	12 individual sighted. Probably more
4.	Preuss's monkey	N06.430327	E009.332171	5 individuals sighted. Probably more
5.	ID uncertain	N06.422839	E009.335648	Suspected faecal droppings of primate
6.	ID Uncertain	N06.425835	E009.314498	Suspected primate feeding sign
6.	Preuss's monkey	N06.426478	E009.334573	2 individuals sighted close to our camp

C. **Threat Indicators observed**

The threat indicators recorded include the following:1. Logging 2. Wire traps. The threats observed were minimal unlike the Oban-Okoroba. This is because most of the survey was conducted within the Cross River National Park which is protected. Also, gun hunting was not recorded during this period.

Figure 6: A. Logging activities within the protected area B. Evidence of Wire Trap within the Protected Area Giant rat caught in trap.

Figure 7: Camera Trap placements

Figure 8: Fecal dropping of primate and collection of fecal samples

3.3 Conservation Education and Awareness Activities

The originally proposed conservation education and awareness programme was not implemented in Oban-Okoroba community during this reporting period. This decision was based on field realities observed upon arrival. Specifically, Oban–Okoroba had no functional schools, and there were very few children of school-going age residing in the community at the time of the survey. Consequently, distributing educational materials such as notebooks, designed specifically for school children, would not have been appropriate or effective. In response to these contextual constraints, the project team made an informed and adaptive decision to relocate the school-based conservation education activities to Nsan, a neighbouring community with both primary and secondary schools. This adjustment ensured that the project objectives related to conservation education were still achieved effectively. At Nsan with approximately 93 students, conservation education sessions were conducted with students, focusing on: The ecological role of the red-eared monkey, Threats to primates and forest biodiversity and Principles of sustainability and community stewardship. Educational materials were distributed (specifically the notebooks printed for this project with the picture of red eared monkey on it to make a lasting statement in the mind of the students), and interactive discussions were used to enhance understanding and participation among students. In addition, conservation education and awareness activities were also carried out at Community Secondary School, Obudu Cattle Ranch with approximately 103 students. These sessions further expanded the reach of the programme and contributed to the overall target of engaging school-aged children within communities surrounding CRNP.

3.4 Community Outreach and Engagement

Beyond school-based activities, community meetings and focus group discussions were organized to engage adult community members. In Oban-Okoroba, my team convened 4 focused group meetings with community members to discuss the importance of wildlife conservation, with particular emphasis on the red-eared monkey. Awareness talks were delivered, and conservation-themed T-shirts were distributed to reinforce messaging and promote visibility of the conservation campaign. Engagement activities were deliberately scheduled during periods of high community availability, particularly in the evenings, to maximize participation. Interactive discussions and informal question and answer sessions were used to encourage dialogue and community ownership of conservation outcomes.

3.5 Stakeholder Engagement and Participatory Approaches

Stakeholder engagement formed a critical component of the project. Initial coordination meetings were held with CRNP management and ranger teams responsible for protection and enforcement within the park. These discussions provided valuable insights that informed subsequent community-level engagement. Community meetings and focus group discussions were conducted with different stakeholder groups, including local leaders and residents. As part of these engagements, questionnaires were administered to assess baseline knowledge, perceptions, and attitudes toward the red-eared monkey and its conservation. To ensure inclusivity and accuracy, questionnaires and discussions were interpreted into local dialects by a member of the project team who is also a trained ranger and familiar with the local language and context. The questionnaire focused on basic aspects of community knowledge and awareness of the red-eared monkey, including recognition of the species, perceived threats, and attitudes toward conservation. The responses provided valuable qualitative data to guide future conservation actions and community engagement strategies. Despite initial logistical and demographic constraints in some communities, the project successfully adapted its approach to ensure that conservation education, community outreach, and stakeholder engagement objectives were achieved.

Representative photographs documenting key activities, including school visits, group discussions, questionnaire administration, and distribution of exercise books, were provided as evidence of implementation and community participation in the Appendix.

Conclusions

This report presents a mid-term assessment of surveys conducted during the rainy season. Field conditions during this period were generally unfavourable, primarily due to persistent rainfall, dense cloud cover, and reduced visibility. These limitations were particularly high in the Okwangwo Division of Cross River National Park, where surveys were frequently affected by heavy fog and low visibility, significantly constraining visual encounter rates and auditory detection of primates. Consequently, estimates from surveys conducted in the rainy season may underrepresent true presence or relative abundance, rather than reflect actual population absence.

However, conducting surveys across both rainy and dry seasons is scientifically critical for accurately characterizing primate population distribution and habitat use. Seasonal variation influences primate behaviour, ranging patterns, vocal activity, and detectability, as well as observer efficiency. During the dry season, improved visibility, reduced fog, and greater accessibility of forest trails generally lead to higher encounter rates and more reliable population assessments. For the red-eared monkey, which occupies dense lowland and submontane forest habitats, seasonal replication is particularly important. Integrating data from both wet and dry seasons allows for a more robust understanding of: True species distribution, Seasonal habitat use, Variability in detectability and Long-term population trends.

Without this seasonal balance, population assessments risk being biased by short-term environmental constraints rather than reflecting ecological reality. The importance of accounting for seasonality in primate surveys is well documented in primate ecology and wildlife monitoring. Seasonal effects on detectability and encounter rates have been reported across tropical forest systems, emphasizing that single-season surveys can lead to incomplete or misleading conclusions about species presence and abundance (Buckland et al., 2010; Plumptre & Cox, 2006; Peres, 1999). Rainfall, fog, and dense vegetation growth during wet seasons are consistently identified as key factors reducing survey efficiency in tropical forests (Struhsaker, 1997). Given these constraints, the current rainy season survey should be interpreted as a baseline presence assessment under suboptimal conditions, rather than a definitive measure of population size or distribution. Planned dry season surveys will be essential to complement these findings and to provide a more accurate, seasonally integrated assessment of the red-eared monkey population within CRNP.

Acknowledgements
I am sincerely grateful to the Cross River National Park management and staff for their institutional support and permission to conduct this research. I especially acknowledge the dedication and invaluable assistance of the park rangers, whose field expertise, guidance, and commitment to conservation were critical to the successful implementation of surveys and community activities. I also extend my appreciation to the community leaders and members of Okoroba, Nsan, Anape, and surrounding communities for their cooperation, hospitality, and willingness to engage in conservation dialogue. I am thankful to my colleagues and field team members for their professionalism, hard work, and support throughout the project, as well as to collaborating partners whose contributions strengthened the quality of this work. Finally, I gratefully acknowledge the Rufford Foundation for their financial support and continued commitment to biodiversity conservation.

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Appendices


Protect the Nigerian Vulnerable
Red-eared Monkey


Rehydration Saves Lives
Protect yourself from
Diarrhoea and Cholera


Protect the Nigerian Vulnerable
Red-eared Monkey


Protect the Nigerian Vulnerable
Red-eared Monkey
SUPPORT
WIND BREAK
SHELTER BELT
COLLABORATE
TO PROTECT