FINAL REPORT TO PRIMATE SOCIETY OF GREAT BRITAIN

PROJECT: CONSERVATION OF ENDANGERED PRIMATE SPECIES OF LOKOLI FOREST, BENIN REPUBLIC

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INTRODUCTION

The Dahomey Gap (i.e. Benin & Togo) is an area of low rainfall with distinct seasonality and with low floral and faunal diversity. This unique ecoregion is a mosaic of semi-deciduous forests, swamp forests, gallery forests, woodland, and savanna. Eight diurnal primate species currently exist in this region: the mona monkey (*Cercopithecus mona*), red-bellied guenon (*Cercopithecus erythrogaster erythrogaster*), olive colobus (*Procolobus verus*), the white-thighed colobus (*Colobus vellerosus*), tantalus monkey (*Chlorocebus aethiops tantalus*), eastern spot-nosed monkey (*Cercopithecus petaurista petaurista*), and the patas monkey (*Erythrocebus patas*) and olive baboon (*Papio anubis*) that mostly occur in woodland and savanna.

Within the Dahomey Gap, one of the remaining habitats where the three rare primates: the red-bellied guenon, the olive colobus and the white-thighed colobus (*Colobus vellerosus*) coexist is the Lokoli forest in southern Benin. Therefore, determining the accurate population density and size of each primate species that lives in the Lokoli Forest is a national and international concern. The data obtained by these surveys could help us evaluate whether these unique primate populations are stable, declining, or increasing. Based upon the result of our study in Lokoli forest and data gathered from other forest fragments in the Dahomey Gap, we can make sound recommendations to the local forest management committee, local authorities, and national and international conservation organizations and these data could be used as a decisive piece of information for the IUCN to elevate the species' status in the Red List. The objectives of this project are:

1) to collect population data on the anthropoid species, especially that of the red-bellied guenon and the white-thighed colobus;
2) to conduct education and outreach activities toward local communities and school children about ecological and economic value of primate conservation;
3) to elaborate an action plan for the conservation of the Lokoli forest's wildlife.

SUMMARY

This project aims to obtain up-to-date data on the threatened anthropoid populations, compare the data with previous surveys, and to develop tools and strategy for a sustainable conservation program. Surveys conducted in the dry season confirm that the red-bellied monkey (*Cercopithecus e. erythrogqster*), mona monkey (*Cercopithecus mona*) and Thomas's Bushbaby (*Galagoides thomasi)* are still present in forest. The encounter rates for the red-bellied monkey and the mona monkey are respectively 0.02 group/km and 0.26 group/km. The olive colobus (*Procolobus verus*) and withe-thighed colobus (*Colobus vellerosus*) were not encountered during the study. Logging activities and poaching reached alarming proportion and large parts of the forest have been cleared for farms. Discussions about sustainable use of the Lokoli forest were initiated with the local management committee of the forest (COSAHLAN). The current high level of hunting and rapid farm encroachment that threatens non-human primate species and other wildlife was stressed during the discussions. We also fostered understanding of and affection toward nature and wildlife in school children through two education sessions.

RESULTS and CONSERVATION MANAGEMENT

I. Study area

The Lokoli swamp forest is a community forest located in the Commune of Zogbodomey in Benin at 7°03' north latitude and 2°15' east longitude. The area of Lokoli swamp forest is about 500 hectares and it is located 8 km from the National Inter State Road 2 (Fig. 1). Three villages (Lokoli, Koussoukpa and Dèmè) surround the forest and the population is estimated at 4000 people with a density of 98 habitants per km². The principal activities are fishing, agriculture, the exploitation of non-timber forest products (e.g. extraction of palm wine from *Raphia hookeri*, the manufacture of mats, etc.), breeding of domesticated animals and small businessses. The network of streams which runs through the forest is part of the Hlan River, which has its source at Cana (located 5 km from Bohicon Town Hall in the Zou Department) and flows into the Ouémé River. The vegetation is rainforest with some degraded zones. Some of the tree species found in the forest are: *Mitragyna stipulosa*, *Antocleista vogelii*, *Alstonia congensis*, *Nauclea diderechii*, *Spondianthus precii*, *Pterocarpus santalinoides*, *Milicia excelsa*, *Ceiba pentandra*, *Raphia hookeri*. The forest is permanently flooded and surrounded by fields (maize, cassava, pepper and peanut). The climate is of Guinean type, with two rainy seasons interrupted by a short, but usually indistinct, dry season in July and a longer one from November to April.

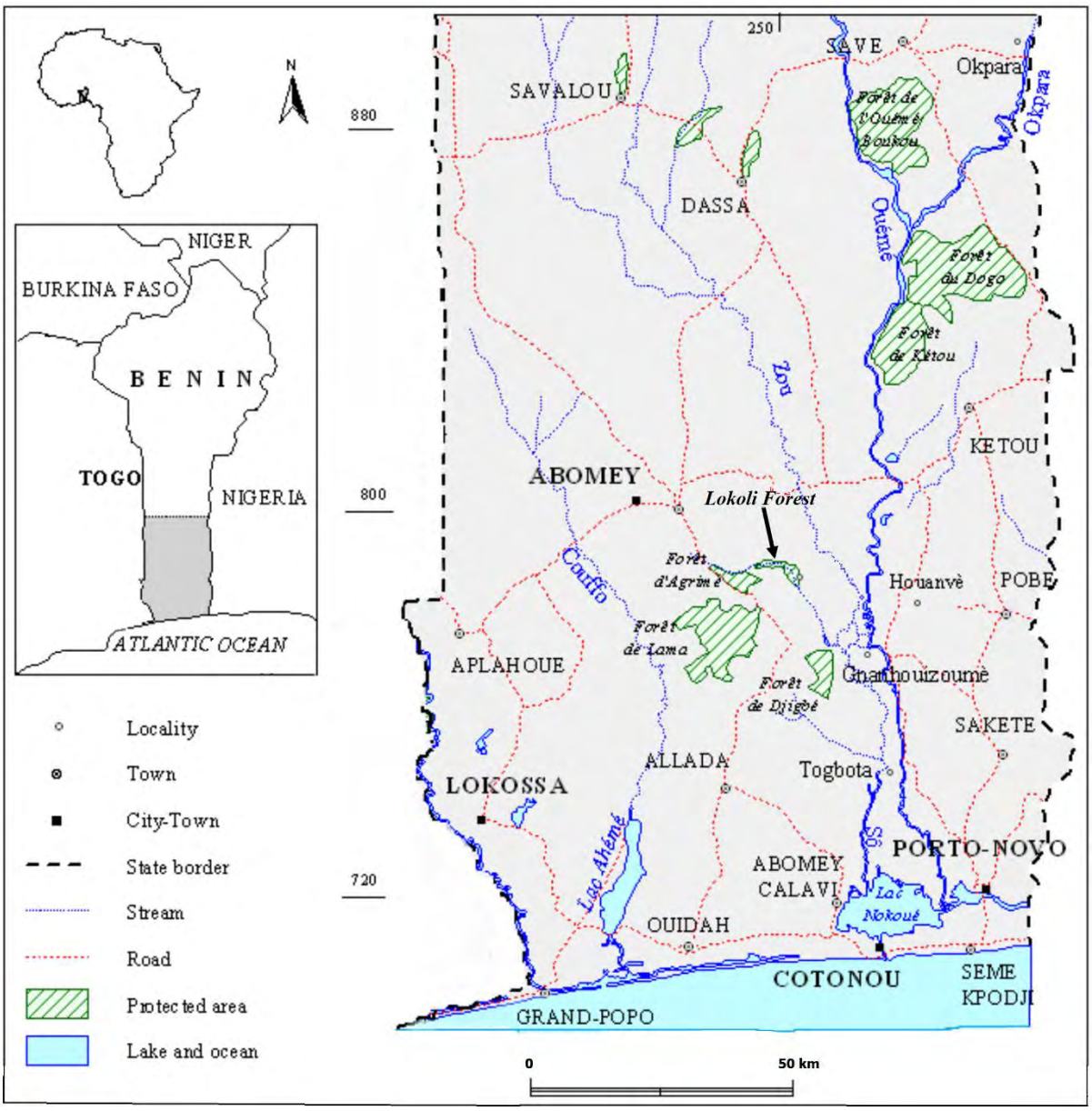

Figure 1. Study area

II. Management of Lokoli swamp forest

1. Forest Management Committee (COSAHLAN)

The local management committee of Lokoli forest (COSAHLAN) was established in 2008. For an effective and equitable management of the forest, six individuals have been delegated per village from the three villages that surround the forest: Dèmè, Lokoli and Koussoukpa. So, the committee is composed of eighteen members. Within the six members appointed by each

village, two individuals received training to serve as field guides for ecotourists. The role of the committee is to protect the forest and work with stakeholders to sustain its conservation.

2. COSAHLAN's partners

Several governmental and non-governmental organizations collaborated with the local committee for projects related to biodiversity conservation, alternatives incomes activities in the villages, sanitation, education, drinking water and health. Among non-governmental organization, we can list NATURE TROPICALE, CEBEDES. Government organizations include DGFRN and GAGES. But since 2014, no conservation activities have occurred and the committee also ceased its activities.

III. ANTHROPOIDS AND PROSIMIANS SPECIES OF LOKOLI SWAMP FOREST

The primate species encountered during the survey is presented in table 1.

Table 1. Primate species encountered during walking and canoe surveys.

Species	Local name	Heard[1]	Seen[1]	Reported[2]	Extirped[2]
Cercopithecus e. erythrogaster	Zin Kakin		x	x	
Cercopithecus mona	Zin Wi	x	x	x	
Chlorocebus aethiops tantalus	Zin Ayiwè			x	
Procolobus verus	Zin Noukoué-noukoué			x	
Cercopithecus torquatus	Zin Kpako				x
Perodicticus potto juju	Tchingbo			x	
Galagoides thomasi	Démontchi	x	x	x	

[1]Primate species heard or seen by the author.

[2]Primate species reported by hunters to be still present.

Primate density could not be estimated (Whitesides et al., 1988) for this study since a sample size of at least 40 encounters is needed to generate a reliable population estimate (Brockelman and Ali, 1987; Krebs, 1999). The encounter rate (sighting and hearing) for non-human primates species is presented in table 2. The night active primate species encountered is Thomas's bushbaby (*Galagoides thomasi*).

Table 2. Encounter rate for the red-bellied monkey and the mona monkey

Lokoli Swamp forest	**Survey effort (km)**	**Encounter rate (groups/km)**	**Group size**	
			Seen	**Estimated[1]**
Red-bellied monkey (*Cercopithecus e. erythrogaster*)	50.6	0.02	3	5
Mona monkey (*Cercopithecus mona*)		0.26	3.3±1.8	6.3±3.4

[1] number of individuals seen plus number of individuals not clearly seen in the same group

The red-bellied monkey encounter at Lokoli is the the lowest in comparison with other sites in Benin (0.08-0.2); and the population size of both the red-bellied monkey and the mona monkey decrease with regard of encounter rate (0.03 and 0.5 respectively (Campbell, 2005)). The decrease in encounter rate reflects a high and stable hunting pressure in the Lokoli forest which has depleted wildlife populations and has constrained the remaining individuals to adopt a cryptic lifestyle.

IV. THREATS FACING ANTHROPOIDS SPECIES: HABITAT FRAGMENTATION AND POACHINGS

High levels of human activity were recorded in the forest including hunting, farming, and logging. The Lokoli forest is under severe exploitation by the local community through forest clearing for new agricultural fields and timber collection. Interviewees reported that 50 ha of the forest had been sold to a foreigner with the help of the head of the district. Once the local population heard this information, they decided to clear much part of the forest for agriculture fields. As the timber trade is currently a common business in all part of the country, logging activities dramatically increased and much larger trees have been logged. Selective logged trees include *Afzelia africana*, *Alstonia congensis* and *Cola gigantea*. All primates, including the red-bellied monkey, are hunted. Although some hunters are member of the COSAHLAN, they never cease hunting activity in the forest. Photos 1 to 12 show anthropogenic disturbances recorded in the surveyed area.

Photo 1. Logged trees

Photo 2. Remaining Logged trees

Photo 3. Burnt part of the forest to install new agricultural field

Photo 4. Setting up of logged trees for charcoal production at the forest boundary

Photo 5. Clearing part of the forest by burning by local people

Photo 6. Traditional alcohol distillation in the forest

Photo 7. Newly established agricultural field, forest in the background

Photo 8. Skulls of olive colobus (*Procolobus verus*)

Photo 9. Skull of dwarf crocodile (*Osteolaemus tetraspis*)

Photo 10. Fur of Sitatunga (*Tragelaphus spekei*) trapped in the forest

Photo 11. Snake killed in a farm near the forest

Photo 12. Snares set at the boundary of agricultural area near the forest

V. CONSERVATION EDUCATION ACTIVITIES

Two education and sensitization panels have been organized with school children at Lokoli village and two panels organized with the members of the local conservation committee.

Photo 13. Talk about the value of forest and wildlife

Photo 14. Description of diurnal primate of Lokoli forest to the school children using a poster

Photo 15. Identification of the mona monkey using local name and photographs

Photo 16. Identification of the tantalus monkey using local name and photographs

VI. PUBLICATION OF THE PROJECT OUTCOMES

The data gathered during this project were used with data gathered in other forests in Benin, Togo and west Nigeria to reassess the conservation status of the red-bellied monkey. The information was presented on August, 25th during the XXVI Congress of the International Primatological Society (IPS) at Chicago. The abstract can be find following the link: https://www.asp.org/IPS/meetings/conferenceschedule.cfm?year=2016&abstractid=7638#7638 .

Photo 17. First slide of my talk

Photo 18. Oral presentation during the IPS Congress

Photo 19. Author and local field guides

Our work was also shared with the public through social media, because we believe that sharing with common folks what we know about primates, what makes them interesting, and

what we do in the forests to conserve them could change their perception towards the wildlife and may change their attitude.

https://www.facebook.com/oddb.ong
https://www.facebook.com/Cercopithecuserythrogastererythrogaster
https://www.facebook.com/Colobus-vellerosus-500509303378466
https://www.facebook.com/Noelenforetoddb

VII. CONCLUSION AND RECOMMANDATION

Overall, two of the five diurnal primate species reported for Lokoli swamp forest in 2002 were still present within the forest. the density of primates was low, with only a few encounters with primate groups. Moreover, other wildlife was also rarely seen during the study. High human pressure was detected, and agriculturists will also hunt these monkeys more and more in the future as a consequence of crop riding conflict due to continuous need in farmland. Altough the white-thighed colobus have not been encountered, hunters are convinced that some remant individuals could be seen during the rainy season. Community forest surveys prove their importance in fauna conservation and should be considered in natural resources management plans in Benin, mainly where protected areas or National Parks are lacking like the southern region of the country. With regard to the above considerations, we recommended that strong measures should be taken to protect the remaining Lokoli swamp forest and its widlife.

VIII. FINAL BUDGET

ITEMS:	COSTS (£)		
	Total	PSGB	ODDB
1. Communication: Internet, Fax, Phone	85		85
2. Local travel, assistantship			
Travel to research site	300		300
Per diem for 2 assistants	480	280	200
3. Conservation education activities			
Education and outreach materials	150		150
Implementation of education and outreach activities	100		100
Subtotal.....	250		250
4. Subsistence in the field			
Food for the team	570	220	350
Total	**1,685**	**500**	**1,185**