QUARTERLY REPORT 1

Activity 1: Ethnozoological surveys on the Liberian mongoose

Title of Application**: Recent history, Ecology and Conservation of the Liberian mongoose *Liberiictis kuhni* (Hayman, 1958): A vulnerable species**

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Introduction

Human population has grown very rapidly over the last two centuries **(Environment & Population, 2011**). This population growth is one of the causes of the increased exploitation of natural resources through a number of human activities, including agriculture, urbanization and mining (**Domenach & Picouet, 2002**). Human activities have radically altered natural environments and biodiversity over the last 200 years (**Pebley, 1998**). Indeed, high population pressure can lead to land impoverishment, depletion of resources, loss of biodiversity and erosion of arable soils (**Leménager *et al.*, 2014**). These human activities are causing a rapid decline in plant and animal species (**Péréboom, 2006**). They also lead to the isolation and degradation of habitats. Intensive farming, hunting and the exploitation of plant and animal species are among the causes of the disappearance of biodiversity (**Amba *et al.*, 2021**). This situation becomes undeniably important in areas close to protected areas. Protected areas also attract many more people in search of survival opportunities (**Fauret *et al.*, 2018**). Today, the scarcity of land resources at the peripheries of Ivorian protected areas exposes them to anthropogenic activities that jeopardize biodiversity of protected areas (**Fauret *et al.*, 2018**).

The Liberian mongoose *Liberiictis kuhni* (Hayman, 1958) is a small carnivore belonging to the Herpestidae family. It is the only species in the genus *Liberiictis* and is endemic to West Africa, where it is found only in eastern Liberia and western Côte d'Ivoire (**Vogt *et al.*, 2012**). It is listed as a vulnerable species on the IUCN Red List of Threatened Species **(Taylor *et al.*, 2016; IUCN, 2024**)

Very little is known about this mammal. The few studies carried out on the species focus on where it occurs, its range and the factors influencing its distribution. They do not address the ethnozoological aspect, which is also a very important pillar to be taken into account for the conservation of this species (**Padonou *et al.*, 2017**). This species occupies a special place in the culture of most of the populations that know it (**Awo *et al.*, 2020**). Given the various threats to the species, endogenous knowledge of its way of life and its cultural and mythical values could provide solutions for its preservation.

The NGO Action pour la Conservation de la Biodiversité en Côte d'Ivoire (ACB-Cote d'Ivoire) submitted a project entitled "Recent history, ecology and conservation of the Liberian mongoose (*Liberiictis kuhni*): A vulnerable species" to the Rufford Foundation for funding.

The project has been approved for funding by the donor. This funding covers a period of twelve months from the date of receipt of funds on 02 April 2024 to 1 April 2025.

This study involved taking stock of the knowledge and perceptions of the Liberian mongoose among the populations of five villages bordering the Taï National Park (TNP).

I. Terms of reference

The brief is to take stock of what is known about the Liberian mongoose. The inventory consists of administering a questionnaire in the form of a summary ethnozoological survey to the populations of Paulé-Oula, Gouléako 1, Taï, Dahobly and Ponan in order to replicate the exercise at the end of the project. This survey will make it possible to establish a baseline level of the populations' knowledge of the biology, ecology and conservation of the Liberian mongoose. In this way, an assessment of the state of knowledge will be carried out among populations that have previously been surveyed and sensitized.

II. Methodology

2.1. Questionnaire

A questionnaire was drawn up as part of the study to gather individual data and compile statistics. The questionnaire was divided into four main sections: identification of the respondent, knowledge of the species, perception of the animal and relationship with the animal.

2.2. Ethnozoological surveys

The assessment of ethnozoological knowledge of *Liberiictis kuhni* began with an exploratory survey in March 2022, precisely from 10 to 13 March 2022, during an awareness-raising mission for the conservation of threatened species. During these pre-surveys, contact was made with local people from different professions: farmers, hunters, tourist agents, eco-guards, pupils, etc (**Bigendako *et al.*, 1995**).

The surveys lasted from 06 to 27 May 2024, with the first day devoted to training volunteers on how to carry out the surveys in order to assist the interviewer. In each village, a volunteer was proposed by the village chief. During the surveys, people were questioned using the questionnaire developed with Kobocollect and supported by a photograph of the Liberian mongoose to give the respondent the opportunity to express himself and to remove any nuances. In the absence of a sampling frame, we used the itinerary method to carry out the survey in village households. Each person surveyed was subjected to a structured interview. The data collected concerned the uses and categories of use of the species, its vernacular name in the

local language and its meaning in the local language, its abundance and conservation (**Byg & Balslev, 2001)**, the uses to which it was put (food, pharmacopoeia, trade) and the threats and conservation strategies for the species at local level (**Lawin *et al.*, 2019**). The method used to determine the sample size was the "quota" method, with a cross-quota between villages to ensure that the information was consistent. A quota of 90 people was therefore set per village (**Mouzoun, 2018**). For the ethnozoological surveys, the villages were chosen on a reasoned basis, with the proximity of the village to the park as the fundamental criterion. The villages surveyed were Ponan, Dahobly, Taï, Gouléako and Paulé-Oula.

The survey was conducted among people from different social categories (village chiefs, notables, hunters, farmers and young people). The age of the respondents was subdivided into five categories: 18-24 years; 25-35 years; 36-49 years; 50-64 years; 65 years and over. When the age is less than or equal to 30 years, this characterizes young people, from 31 to 50 years characterizes adults and 51 years and over characterizes seniors. The interview was identical for all social categories. It was conducted in French and in the local languages of Oubi, Guéré, Baoulé, Mossi, Yacouba, Malinké, Kroumen, etc. To facilitate the smooth running of the interviews with the local population, the chiefdom of each village allowed a youth representative (a trained volunteer) to join the team of interviewers and accompany them. The personal information collected during this ethnozoological study related to the interviewee's first and last names, profession, locality (village), ethnic group, age group and, if possible, marital status. The interviews were participatory and individual (**Yaokokoré-Béibro *et al.*, 2010; Koué Bi *et al.*, 2015**).

2.3. Choice of villages and survey sample

Surveyed villages were chosen on the basis of their proximity to the park and the presence of socio-cultural groups.

In the absence of a sampling frame, we used the itinerary method to carry out the survey in village households. With regard to the communities, we met during the surveys. Four criteria were used as a basis for judging who should be included in the sample: age, sex, locality and knowledge of the animal.

On the basis of all these methodological considerations, we interviewed a total sample of 450 individuals, distributed as follows:

2.3.1. Age

Table I shows that 88.67% of respondents were aged over 24. In socio-economic terms, this age group corresponds to the most active category of the population, i.e. those with decision-making power in terms of natural resource management. It can be said that this sample is representative of the population of the localities surveyed in terms of their relationship with natural resources.

Table I: Breakdown of the sample by age

Age range	Localities					General total	Proportion
	Dahobly	Gouléako 1	Paulé-Oula	Ponan	Taï		
18-24 years old	8	16	8	8	11	51	11.33%
25-35 years old	24	26	8	12	23	93	20.67%
36-49 years old	39	28	41	36	28	172	38.22%
50-64 years old	17	18	32	32	20	119	26.45%
65 years old and over	2	2	1	2	8	15	3.33%
General total	**90**	**90**	**90**	**90**	**90**	**450**	**100%**

2.3.2. Gender of respondents by locality

Table II shows that 74.22% of respondents were male and 25.78% were female. The 25.78% of women is justified by the fact that women are very reticent during surveys and very often refuse to answer the questionnaire.

Table II: Breakdown of the sample by gender

Sexes	Localities					General total	Proportion
	Dahobly	Gouléako 1	Paulé-Oula	Ponan	Taï		
Female	36	30	19	16	15	116	25.78%
Male	54	60	71	74	75	334	74.22%
General total	**90**	**90**	**90**	**90**	**90**	**450**	**100%**

2.3.3. Main activities

Table III shows that the main activity of the people surveyed is agriculture, accounting for 72.67% of responses.

Table III: Breakdown of the sample by professional activity

Main activities	Localités					General total	Proportion
	Dahobly	Gouléako 1	Paulé-Oula	Ponan	Taï		

Farmer/Cultivator	74	54	72	59	68	327	72.67%
Student	0	0	2	0	0	2	0.44%
University student	0	0	1	0	0	1	0.22%
Contract worker	14	20	10	9	12	65	14.44%
Housewife	0	0	1	1		2	0.44%
Salaried worker	2	16	2	20	8	48	10.67
Maquis owner	0	0	2	1	2	5	1.11%
General total	**90**	**90**	**90**	**90**	**90**	**450**	**100%**

2.3.4. Educational attainment

Table IV shows that the literacy rate of those surveyed was 66%, compared with 34% illiteracy. It can be said that the sample surveyed has basic skills enabling them to read, understand and apply the texts and awareness-raising messages related to the project.

Table IV: Breakdown of sample by level of education

Education level	**Localities**					**General total**	**Proportion**
	Dahobly	**Gouléako 1**	**Paulé-Oula**	**Ponan**	**Taï**		
Out of school	35	42	27	30	19	153	34.00%
Primary	36	28	34	29	23	150	33.33%
Secondary	16	18	26	29	42	131	29.11%
Higher	3	2	3	2	6	16	3.56%
General total	**90**	**90**	**90**	**90**	**90**	**450**	**100%**

III. Results

3.1. General knowledge of the Liberian mongoose

3.1.1. Knowledge of the Liberian mongoose by the populations surveyed

To assess knowledge of the Liberian mongoose, people were asked if they had ever seen the animal. Respondents were asked if they had ever been in contact with the animal (regardless of how the contact was made). The results show that the animal is little known to the local population, as shown in Figure 1.

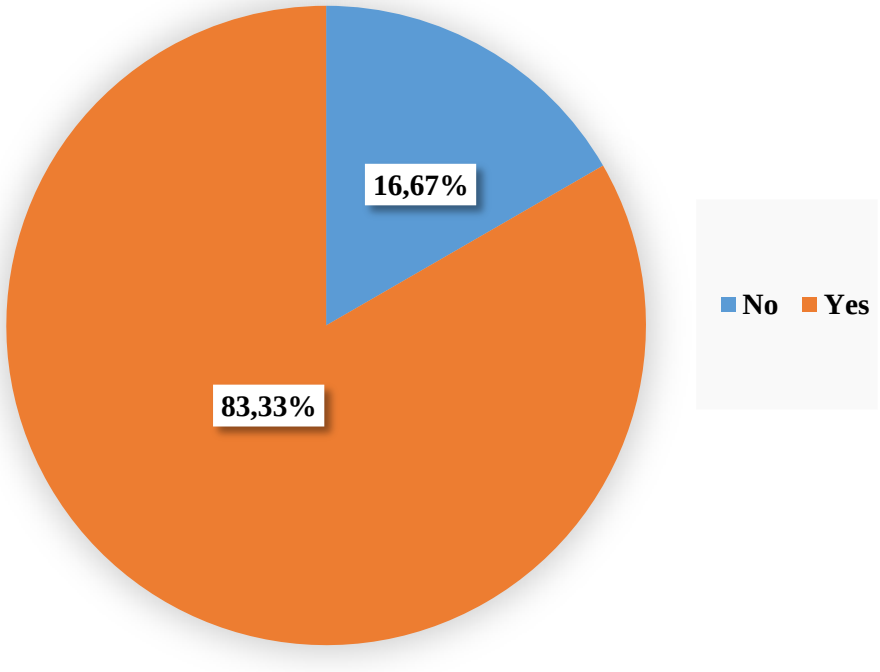

Figure 1 : Knowledge of the Liberian mongoose by the populations surveyed

According to this figure, 16.67% of respondents claimed not to have seen the Liberian mongoose, while 83.33% acknowledged having seen the animal. Furthermore, according to the respondent's main activity, the majority (72.67%) of people who had seen the animal were farmers.

In the light of these statistics, it can be said that the Liberian mongoose is well known to local populations and that this knowledge is linked to the exploitation of its habitat.

3.1.2. Different names

The local name for the Liberian mongoose and the meaning of the name varies according to ethnic group. This is summarised in Table I below:

Ethnic group	Ethnic name
Ahizi	Tchrè
Bambara	Kôbala
Baoulé	Bôzuê, Wôzuê
Bété	Souhla, Soukla
Guéré	Séhan
Malinké	Ninkéli, Nourani, pinzère, Winzinni
Mossi	Fiafia, Pihifo, Oussolo, Winzinni

Kroumen	Sala
Oubi	Sala
Sénoufo	Firou, Kêzanni , Winzinni
Tagbana	Tchonhon
Yacouba	Diôhoun, Guê, Mlon

3.1.3. Recognition capability

Several characteristic traits are attributed by respondents to the Liberian mongoose to differentiate it from other small carnivorous vertebrates. There are five (05) of these distinctive traits. They are recognition by calls (42.13%), the animal's physical appearance (39.20%), traces of its burrows (14.67%), by its smell (3.73%) and food remains (0.27%) (**Figure 2**).

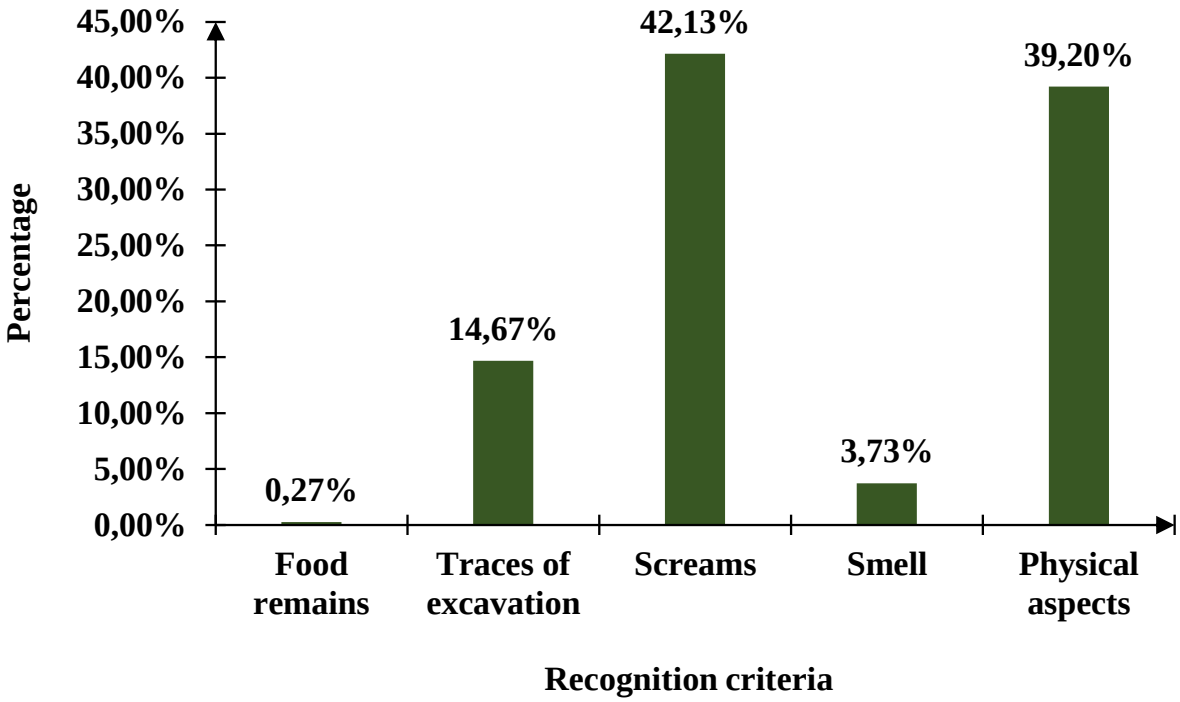

Figure 2: Recognition traits of the Liberian mongoose

3.1.4. Living environment (preferred habitat) of the Liberian mongoose according to surveys

According to the respondents, mongooses live in groups. It is rare to see it alone and a group of mongooses comprises an average of seven (07) individuals. The living environment of the Liberian mongoose is diverse, as shown in the graph below (**Figure 3**).

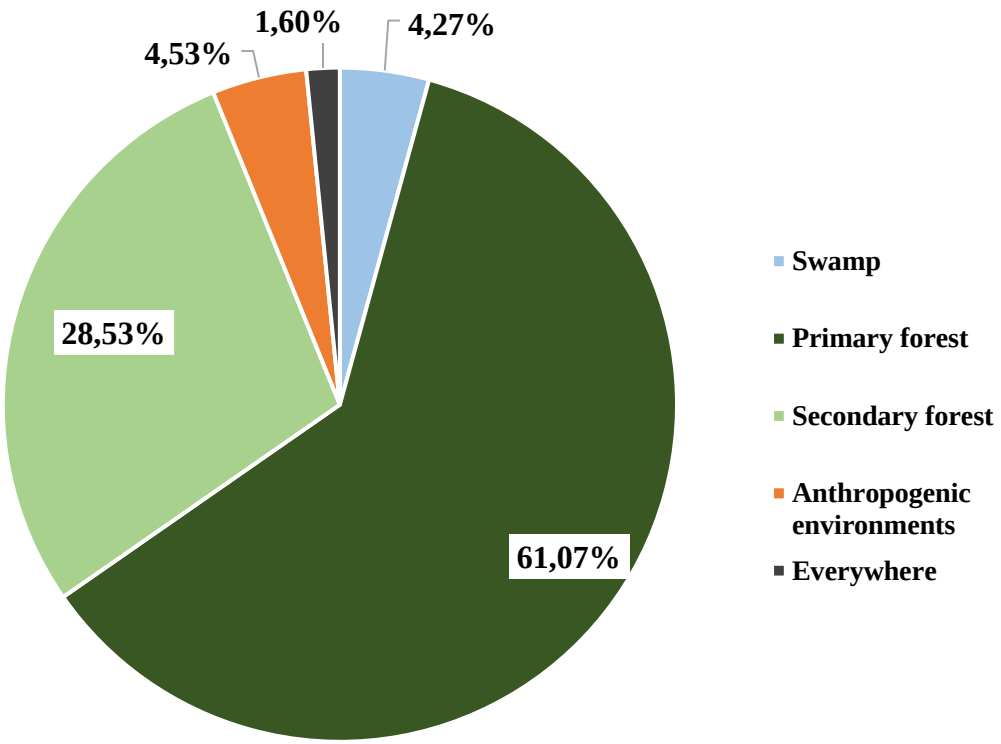

Figure 3: Preferred habitat according to surveys

3.2. Different uses

Figure 4 presents the frequencies of citation of the uses of the Liberian mongoose among the people interviewed in the peripheral localities of the NTP. It emerges that people use the Liberian mongoose more for food, with 85.94% of quotations. Then 9.27% of people interviewed said they didn't know what it was used for. Tourist uses are less represented with 5.43% of quotes. According to 3.51% of respondents, the Liberian mongoose is a totem, and pharmacopoeia uses account for 0.96%. Nevertheless, these uses are also well represented among certain ethnic groups surveyed. The communities in the peripheral localities of the TNP have a good diversity of uses or exploitation of Liberian mongoose populations.

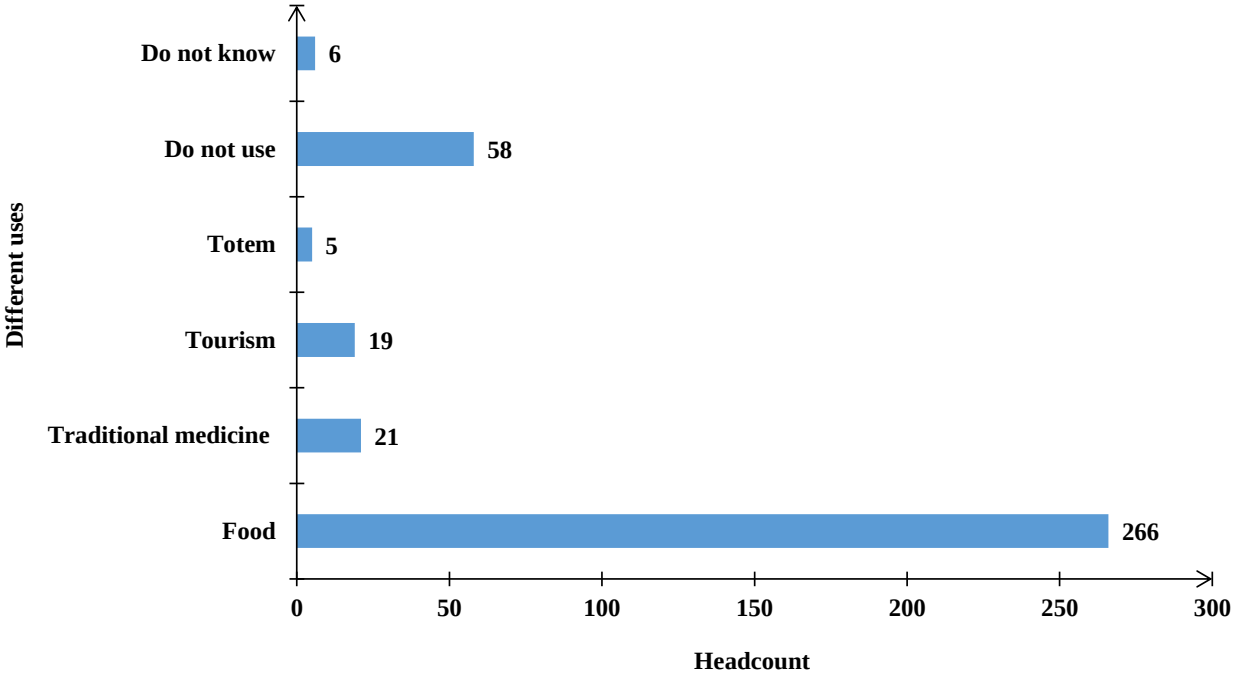

Figure 4: Number of mentions of different uses according to the sample surveyed

3.3. Perception of the presence of the Liberian mongoose

With regard to the importance of the Liberian mongoose in the Taï area, the statistics in this graph show that only 9.87% of respondents who knew of it claimed to have seen it very recently in the area (**Figure 5**). According to them, mongooses reproduce rapidly and the presence of the Taï National Park helps to increase their population. In addition, as local people have been made aware of the need to conserve the species, hunting of the animals has decreased in the region.

Most of the people interviewed said that the Liberian mongoose population was declining in the area. According to them, there are several reasons for this. The first was the destruction of its habitat by intense agricultural activity in the area. The second reason given was poaching. According to the respondents, hunters and farmers who set traps or use plant protection products threaten these animals. The mongooses are thus poisoned with chemicals. Finally, the last factor highlighted is population growth. This population growth leads to developments that reduce the living space of these animals.

These different situations mentioned lead to a reduction in the abundance of the Liberian mongoose, which also leads to a reduction in its presence in the area. The 9.87% of respondents who knew of the Liberian mongoose said that they had only observed it in the Taï.

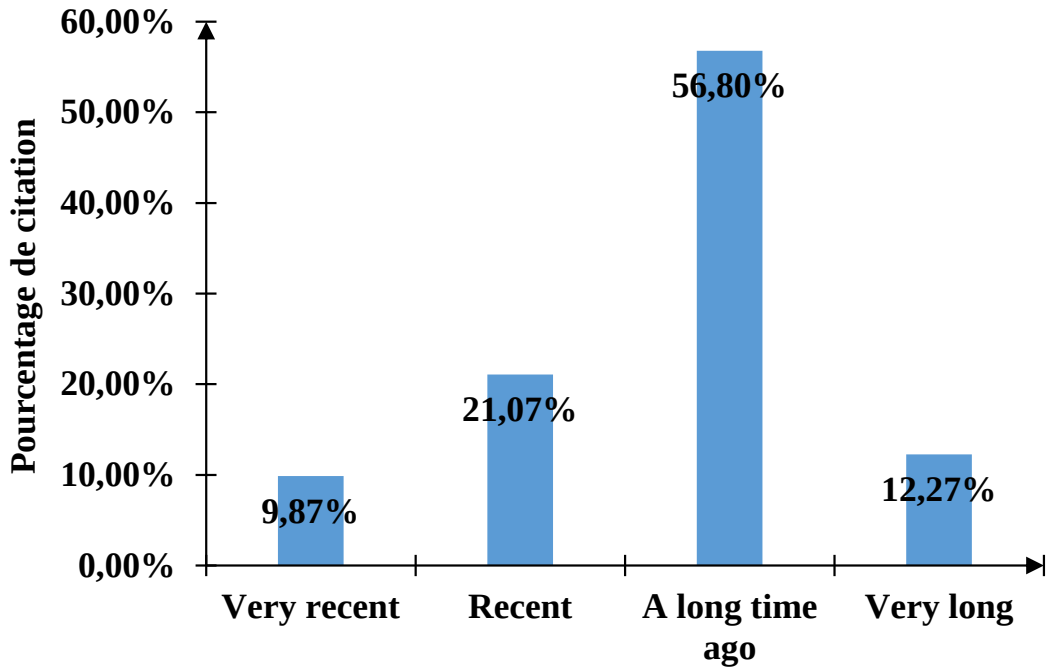

Figure 5: People's perception of the presence of the Liberian mongoose

3.4. Capture means

Analysis of the survey data showed that cable traps were the most widely used means of capture, with 92.53% of responses (**Figure 6**)

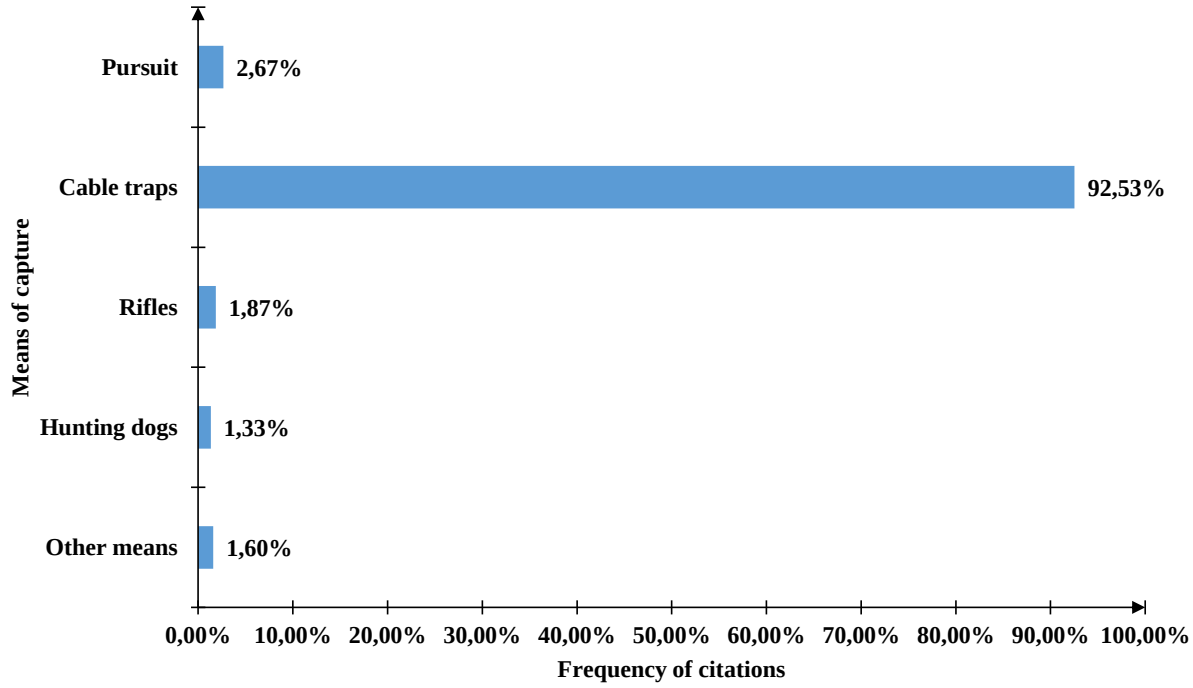

Figure 6: Capture means

3.5. Interviewee's perception of the causes of the species decline

This figure shows the perception of the people interviewed on the causes of the decline in the Liberian mongoose population. It emerges from the analysis of this figure that deforestation is the main cause of the decline of the Liberian mongoose with a proportion of 56.87% of quotations. It is followed by poaching, which accounts for 19.81% of citations. Hunting (6.71%), phytosanitary products (5.11%), urbanization (4.47%), soil degradation (4.15%) and agriculture (2.88%) were the causes least cited by interviewees. These trends are showed in **figure 7**.

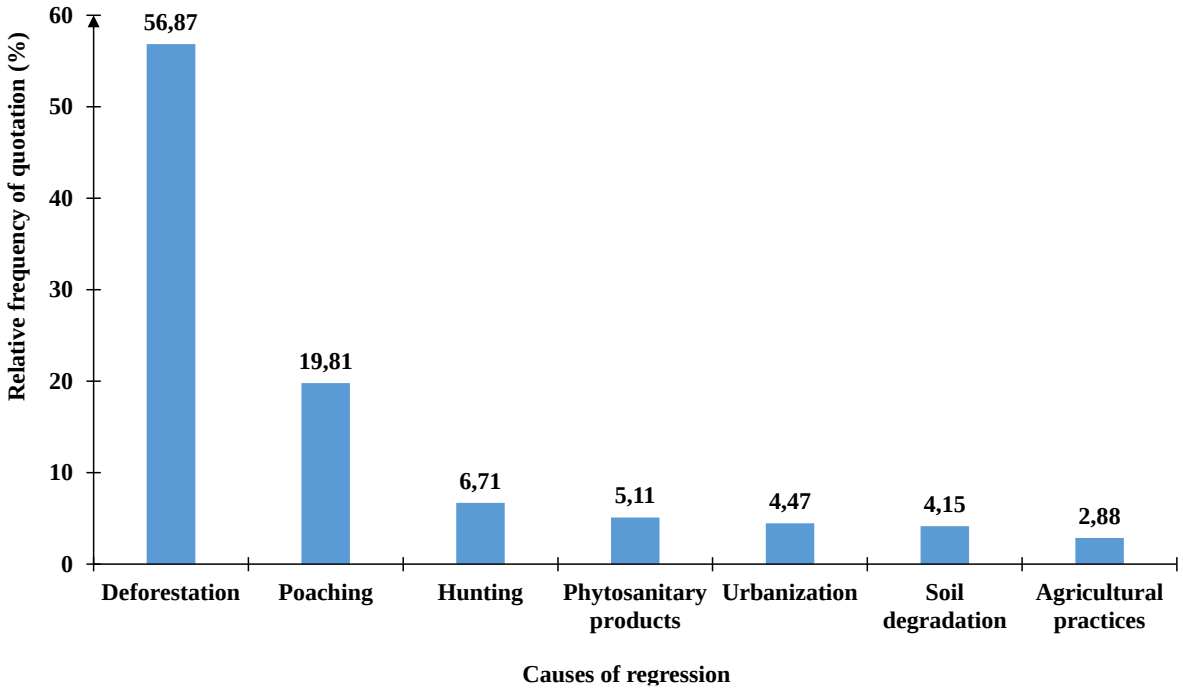

Figure 7 : Reasons for the decline of the Liberian mongoose according to the sample surveyed

3.6. Actions to be taken

Figure 8 shows that 96% of respondents said it was important to take action to protect and conserve the Liberian mongoose in the Taï area. They recommend the creation of conservation NGOs to perpetuate awareness actions in favour of threatened species. They also recommended banning hunting, and monitoring the Liberian mongoose population to TNP by conducting studies on the species to find out more about it.

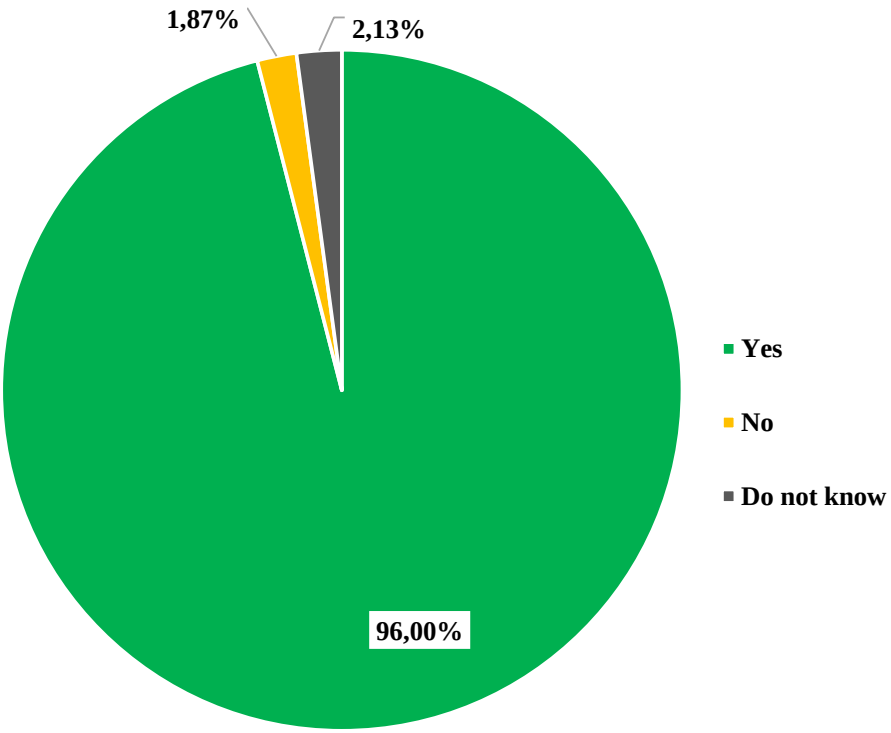

Figure 8: Actions to be taken for the conservation of the Liberian mongoose according to the sample

Conclusion

At the end of this study, a total of 450 peoples were interviewed. The objectives of the mission were achieved. 83.33% of the people questioned said they knew about the Liberian mongoose. 56.80% of these people said they had seen it a long time ago in their fields. It would therefore be very important to raise awareness of biodiversity conservation in general and of the conservation and protection of the Liberian mongoose in particular. Some images of ethnozoological surveys in the five sampled localities are attached to this report as attachments.

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