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**INTEGRATED CONSERVATION AND DEVELOPMENT PROJECT
AT THE PERIPHERY OF THE DJA BIOSPHERE RESERVE
(CAMEROON):
GREAT APE CONSERVATION
FOR SUSTAINABLE HUNTING AND INCREASED LIVELIHOOD.**



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LIST OF ABBREVIATIONS.

DBR:	Dja Biosphere Reserve
PGS:	Project Grands Singes
CWMC:	Community Wildlife Management Committee
ICDP:	Integrated Conservation and Development Project
ERK:	Encountered Rate per Kilometre
ECOFAC:	Ecosysteme Forestier d’Afrique Central
MoU:	Memorandum of Understanding
LWC:	Limbe Wildlife Center
MCP:	Mount Cameroon Project.
MINFOF:	Ministère des Forets et de la Faune
CHZ:	Community Hunting Zones.
Km:	Kilometre
NGO:	None Governmental Organisation
FipCam:	Fabrique Camerounaise de Parquet
UTO:	Operational Technical Unit
FMU:	Forest Management Unit
MWMA:	Mokoko Wildlife Management Association
GPS:	Global Positioning System

Abstract

The pressure on the mammal fauna in and around the Dja Biosphere Reserve (DBR) due to hunting and other human disturbances is well documented. Initial surveys conducted by Projet Grands Singes (PGS) in the three villages; Malen V, Doumopierre and Mimpala, at the northern periphery of the Dja Biosphere Reserve revealed the presence of important populations of great apes being used by the villagers. Upon request by the local communities, a project aimed at protecting great apes, controlled hunting and support for local development was set up in 2002. A Rufford Small Grant and a Rufford Continuation Grant supported this project, which was based on scientific research. A local management committee has been set up and is recognized by the government. With the help of the Booster Grant, we planned to make the management committee which is responsible for the different aspects of this conservation and development project, fully operational.

A combination of methods including brainstorming, group discussion and “strength weakness potentiality and obstacle analysis” were used. These were applied during workshops, meetings, surveys and practical sessions in the field.

PGS local collaborators and the Community Wildlife Management Committee (CWMC) contributed enormously to attain the objectives.

The presentation of activities of PGS (2004-2006) in the three new villages demonstrated that the CWMC of the first three villages have advanced in forest resource management.

The Community Wildlife Management Committee was trained on large mammal surveys and monitoring and their participation together with PGS local collaborators in surveys, data collection and analysis helped to dispel myths on the technology and methodology used.

Participative surveys equally indicated the presence of high density and diverse large mammal populations but increased poaching activities mostly by external hunters resulted to decreases in the densities of some species. A comparison of the 2004 and 2006 Encountered Rate per Kilometre (ERK) of the different species enabled the villagers to evaluate data they collected in different years in the same area. Indicators of the increases and decreases in specie density in the different areas tested were confirmed by personal observation on the field. Local communities also appreciated the nature of the threats. Activities to mitigate these threats were identified.

A major threat was increased poaching partly as a result of the suspension of the activities of the “Ecosysteme Forestier d’Afrique Centrale” (ECOFAC) in the villages.

Despite the remoteness of the area, the recent importation of Chinese motorbikes (which are cheap and easily affordable) to Cameroon rendered the area relatively accessible for both poachers and bush meat traders.

Two major alternative activities to bush meat hunting and trading are cocoa farming for men and crop farming for women. The promotion of these two activities will likely have a positive impact on the livelihood of the local people. Women are organised and are engaged in other income generating activities.

During this study, the acquisition procedure for the set up of a hunting management plan was identified. The CWMC remained a corner stone in the process of the implementation of a participatory management plan for hunting at the periphery of the DBR. Empowered of the CWMC by the local authorities in charge of wildlife is needed. Thanks to the 2006 Whitley award, the CWMC will still be supported in the context of:

- Helping them to develop partnership with other associations, projects, logging exploiters and authorities in charge of forestry and wildlife.
- Setting up concerted anti-poaching activities at the periphery of the DBR.
- Legalising of the hunting management plan according to the Cameroon law by September 2007.
- Promoting the appropriate alternatives activities to hunting.

INTRODUCTION

The pressure on the mammal fauna in and around the DBR due to hunting and other human disturbances is well documented. The local people themselves are aware of this phenomenon, but with increasing human population, their former ability to maintain a sustainable level of resource use is being compromised. It is imperative that they receive guidance and training in order to develop the capacity to better manage and protect these natural resources. This has become even more critical with the current “bush meat” crisis and consequent unsustainable hunting levels.

Key elements for this work are local capacity building and participatory management. After initial surveys and negotiation with the local people in 2001, data have been collected on great ape socio-ecology, hunting mechanisms and pressure, prey species densities and distribution, and on local socio-economics. A local management committee has been set up and is recognized by the government. Data collection and set up of the local management committee was partly supported by a Rufford Small Grant and a Rufford Continuation Grant. With the help of the Booster Grant we plan to support the management committee for development and execution of the different aspects of this conservation and development project. The activities can be categorised under six headings:

1. Comprehensive presentation and discussion by the CWMC of the results and outcomes of the study 2002-2004 in the neighboring villages that showed official interest to join the Integrated Conservation and Development Project (ICDP),
2. Training local large mammal survey teams,
3. Faunal surveys and monitoring of hunting activities,
4. Elaboration of a hunting management plan by the CWMC and legalisation of this plan by the Cameroonian authorities,
5. Monitoring of agricultural activities and
6. Analysis of the functioning of the CWMC in the first three villages and the potential to set up controlled hunting in the second group of three villages.

CHAPTER I

THE STUDY AREA

1.1 Geographical Location

The DBR is located in the South East of Cameroon, (figure 1). It was designated as a biosphere reserve in 1981, and was registered on the world brotherhood in 1987. To satisfy national goals, the reserve was classified as an Operational Technical Unit (UTO) of the first category (Decree No. 037/CAB/CM, 19 April 1994) with a surface of 526,000ha. At the national level, the reserve represents about 20 % of the total network of protected areas, and occupies a first place amongst the protected areas in Cameroon. The natural barrier of the Dja River borders the reserve. The DBR expands from 12°30 degrees to 13°40 degrees longitude east and from 2°50 degrees to 3°30 degrees latitude north. The study zone is situated at the northern periphery of the DBR, in the south-western part of the Forest Management Unit (FMU) 10 047. The study zone belongs to three villages (Malen V, Doumo-Pierre, and Mimpala). A Memorandum of Understanding (MoU) has been signed between the local communities and PGS. Within the study zone there are two sub-areas: one for research on the socio-ecology of great apes (this area covers approximately 60 km²) and the other around the three villages for sustainable hunting. Malen V, Doumo-Pierre and Mimpala are situated along the north-south road at distances of 0km, 2.5km and 6km respectively. The great ape research site is situated at about 10 km east of this road. Malen V is about 44km from the logging town Eboumetoum, and 60km from the town Messamena.

1.2 Abiotic environment

1.2.1 Relief and topography

Like the Reserve, the study area is characterised by a hilly relief. It is situated on a Precambrian plateau at an altitude which varies from 500 – 700 m (Letouzey, 1968; Gartlan, 1989; Sonke, 1998). The relief undulates into valleys that become steeper as they run towards the Dja River.

1.2.2 Hydrography

Rivers in the study area -Mpouo, Djo, Nkoun, Leuh, and Modalebim- are tributaries of the Dja River.

1.2.3 Geology and Pedology

The study area is situated on granite beds, intercalated with fine-grained quartz (Letouzey, 1985). As in most forest areas, the soil is poor in nutrients. The equatorial climatic conditions, coupled with exposure to vigorous heating of the earth by the sun, favour the leaching and migration of biogenic captions.

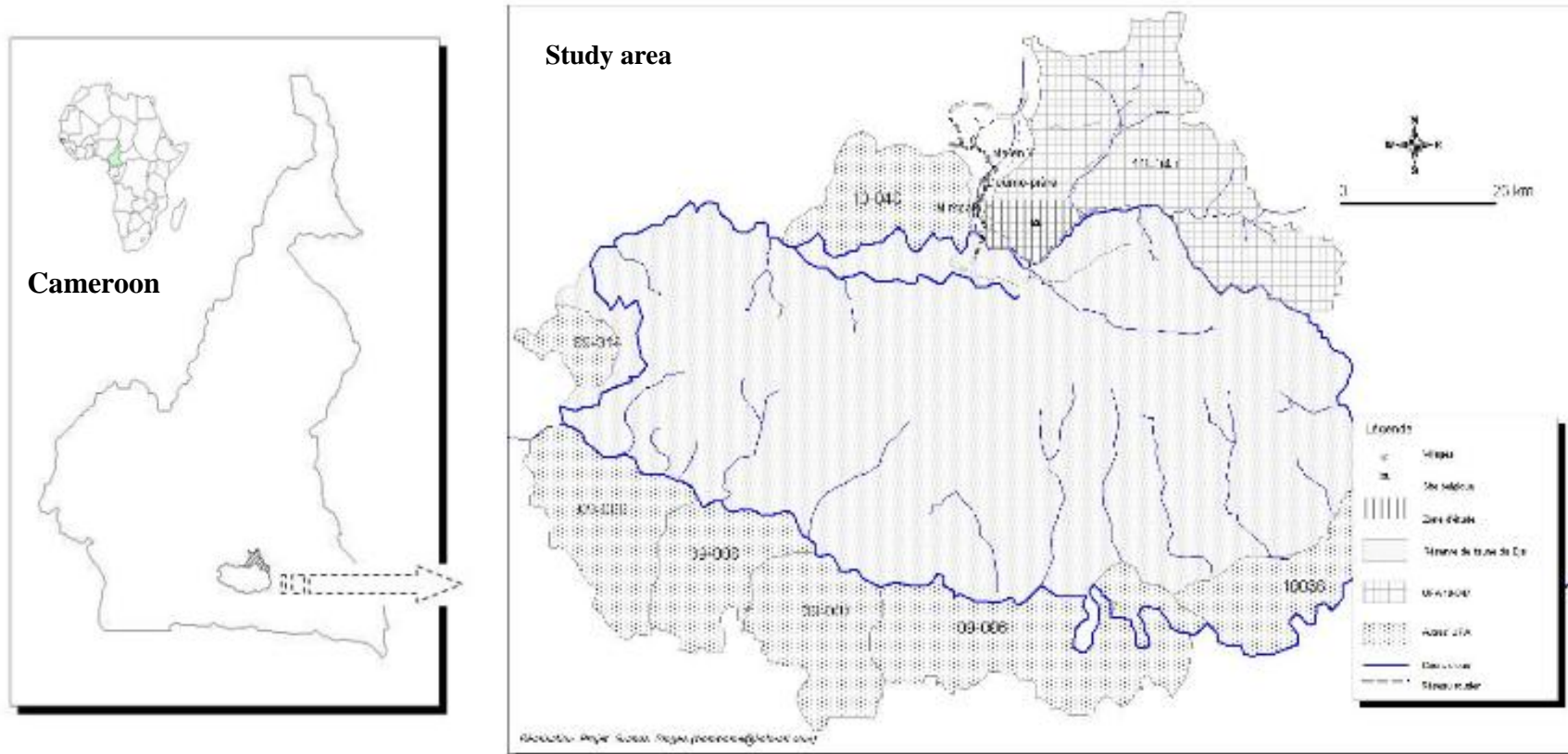


Figure 1: Cameroon and the study area

1.2.4 Climate

The equatorial climate is marked by four seasons, which differ in rainfall levels:

- * The long dry season, this last from mid-November to mid-March.
- * The short rainy reason, from mid-March to mid-June.
- * The short dry season, from mid-June to mid-August.
- * The long rainy season, from mid-August to mid-November.

Climatologically, data collected in the study area showed that the average annual temperature is 23.5°C, with an annual rainfall of over 1,500mm.

1.3 Biotic environment

1.3.1 Flora

Sonke (1998) recognises three different forest types: terra firme forest (around 75%), swamp forests (around 20%), and forests on a rocky substratum (around 5%). From a physiognomic point of view, Sonke further recognises amongst these heterogeneous forests certain types: rattan forest, raffia forest, and typical heterogeneous forest.

Lejoly (1998) provides the following description of the floral characteristics of the region:

Meliaceae, Caesalpinieae, and Mimosaceae dominate very old terra firma Secondary forests. Several characteristic features include areas where *Raphia rigalis* and rattans dominate, and very heterogeneous areas where no particular species are dominant.

Secondary forests are dominated primarily by *Musanga cercopoides*, *Trema orientalis*, *Triplochiton scleroxylon*, *Ricinodendron heudelotii*, *Terminalia superba*, *Zanthoxylum* spp., *Caloncoba* spp. and *Macaranga* spp.

The species most prominent in alluvial forests include *Chlamydocola* spp., *Chlamydantha* spp., *Lasiodiscus manii*, *Mytragyna stipulosa*, *Nauclea pobeguinii*, *Pseudospondias microcarpa*, *Raphia monbuttorum*, and *Raphia hookeri*.

Single-species forests of *Gilbertiodendron dewevrei* are found in the floor of relatively large valleys. These forests are characterised by rapid regeneration.

Species characteristic of saxicole forests are: *Aelanthus* spp., *Afrotrilepis pilosa*, *Bacoba* spp., *Causena anisata*, *Dissotis decumbens*, *Lycopodiella* spp., *Mallotus oppsitifolius*, *Marantochloa* spp., *Markhamia tomentosa*, *Janseviere trifasciata*, *Selaginella myosorus*, and *Utricularia* spp.

Pteridophytes, Cyperaceae, and Poaceae dominate swampy forests.

Also found here, especially in the west of the reserve, are small areas of *Coula edulis*. From the ecological point of view, Letouzey (1985) reported that 82.9 % of the woody species found in this area are zoochorous.

1.3.2 Fauna

Studies conducted in and around the DBR indicate that the area may hold as many as 109 mammal species (from 10 orders, in 34 families), 360 bird species, and 62 species of fish (ECOFAC, 2003).

The mammal species found in this area that are of particular interest to conservation are:

- * Western Lowland Gorilla (*Gorilla gorilla gorilla*)
- * Central Chimpanzee (*Pan troglodytes troglodytes*)
- * Forest Elephant (*Loxodonta africana cyclotis*)
- * Forest Buffalo (*Syncerus caffer nanus*)
- * Leopard (*Panthera pardus*)
- * Giant Pangolin (*Manis gigantea*)
- * Aardvark (*Orycteropus afer*)

CHAPTER II

COMPREHENSIVE PRESENTATION AND DISCUSSION BY THE CWMC OF THE RESULTS AND OUTCOMES OF THE STUDY 2002-2004 IN THE NEIGHBORING VILLAGES THAT SHOWED OFFICIAL INTEREST TO INTEGRATE THE ICDP;

2.1 Introduction

The exercise was aimed at explaining to the local communities of the three new villages, what was experienced by those of the first three villages and also what took place in their mist. This was to enable the later to understand their shortcomings and also to take better decisions for their future. They criticized and learned from their mistakes. Many taboos were broken when the presentation was done by one of them. The following aspects were presented in the new (neighbouring) villages (Ntibonkeh, Eschou and Madjuh 1) that showed official interest to integrate the ICDP:

- Evaluation of the need for a participatory management
- Presentation and preparation of PGS start-up team
- Preparation of the partnership
- Socio-economic studies
- Off take estimation
- Mammal survey
- Training on survey and leadership
- Visit trip to Mokoko.

2.2 Evaluation of the need for participatory management

The CWMC during the presentation (figure 2), made it clear that it was necessary to first evaluate the need for a participatory management for the local people of the first three villages. They summarised the results as follows:

- They share the same language and the same culture
- Malen V and Doumo-Pierre are from the Bampom ethnic group while Mimpala is from the Bazindja: These offered possibilities for marriages and establishment of strong links between the three villages.
- The traditional structure is very weak and not respected giving ways to conflicts of generation between young and old people.
- Young people are prone to drinking excessive amount of alcohol and it is not easy to reach agreement on community goals.
- There is no real leadership in the community.
- Access to resources is not regulated and depends on the capacity of each person to get to resources.

The inhabitants of the new villages realised that their social life was equally weak and emphasised that they also need assistance to organise themselves to improve division of their natural resources amongst their community.

2.3 PGS start-up team

The need for selection and training of the starting team was recalled by the CWMC in the neighbouring villages. Based on our experience, the training of this start-up team was very important. Our initial team of animators received the training, but subsequent teams never received any training and thus were not functioning well as the first team. The local people made this remark. The villagers initially wanted the animators to be changed every year, but we realized that it was not possible to give adequate training to new teams on a yearly base.



Figure 2: CWMC after the presentation in the three new villages

2.4 Preparation of the partnership

2.4.1 Memorandum of Understanding (MoU) and Election of the CWMC

The CWMC explained that for an effective participatory management, all the stakeholders have to agree on the same objectives. The MoU (Figure 3) specifies the participation of all the parties under the supervision of the Ministry of Forestry and Wildlife. It appeared that the establishment of a MoU and the election of members of the CWMC provided an opportunity for an in-depth discussion with the local population and acted as an indicator of the community's willingness to participate in the whole process.

2.5 Socio-economic studies

The CWMC presented the results of the studies conducted in the households of the first three villages. The activities and expenditures of the local people recorded were summarized as follows:

1. The population remained fairly constant from 2002-2003
2. Men were mostly active in the forests (hunting) and women in the plantations (agriculture).
3. Hunting was mostly carried out in the rainy season.
4. Fishing was the main forest activity in the dry season.
5. Both hunting and fishing occurred throughout the year.
6. A large proportion of household income (44%) was spent on locally produced alcohol.
7. It was important to establish a local shop to enable villagers buy other goods than alcohol.

Local people in the neighbouring villages realized that their activities, forest utilization as well as their attitude toward alcohol were similar to those of the villagers of the first three villages.



Figure 3: Signature of the Memorandum of Understanding

2.6 Off take

For the implementation of a sustainable hunting system, bush meat off take was necessary for quotas setting. The result presented by the CWMC revealed the following:

1. Most hunting (93%) was carried out using snares and snare hunting was mostly for subsistence purposes.

2. Snares are illegal in Cameroon but were widely used and the Cameroonian authorities in charge of wildlife acknowledged it.
3. It was impossible to enforce a ban on their use.
4. Thus how can snare hunting be controlled?
5. A snare hunting management plan (restrictions on number of snares per hunter, respecting reproductive seasons, restricting sitting of snares) was necessary.
6. It was necessary to follow-up to see if the plan actually worked.

2.7 Mammal survey

The CWMC explained in the neighbouring villages that mammal survey was necessary to:

1. Provide useful information which enables managers (the local community) to identify “hunting hotspots” used by external hunters.
2. Provide crude information on relative abundances of game species.
3. Provide information necessary for the set up of quotas

2.8 Training on survey and leadership

Training on simple research techniques was important to empower local people. This helped them to monitor their wildlife and also to be able to manage it better with the purpose of establishing a hunting management plan.

2.9 Visit trip to Mokoko

Two representatives of each village and members of the CWMC visited the Limbe Wildlife Center (LWC) and the Mokoko Wildlife Management Association (MWMA) formerly supported by the Mount Cameroon Project (MCP). The goal of the visit was to allow direct exchange of ideas and experiences.

The CWMC explained in the neighboring villages that one important thing they realized was that, implementing a participatory management plan for sustainable hunting was possible. They equally realized that, it could be done by local people based on the support of PGS and under the supervision of MINFOF, as was the case in Mokoko supported by MCP. They supported the idea that a single gorilla or chimpanzee in the Zoo can produce more money in many years than when killed, eaten or sold. They presented the approach of PGS as a way to help them gained more benefit from the natural resources of their forest.

CHAPTER III

TRAINING LOCAL LARGE MAMMAL SURVEY TEAMS.

3.1 Introduction

The 1994 forestry law in Cameroon enables local people to actively participate in wildlife management through the establishment of Community Hunting Zones (CHZ). For this to be effective, the local people are required to submit a hunting management plan to the government. Unfortunately, most local people lack the skills to develop and implement such a plan. Thus, local people from villages on the northern periphery of the DBR approached PGS to assist them in the establishment of a sustainable hunting management plan.

As a step towards the development of a hunting management plan, the villagers requested training in the following:

- The use of navigation equipment in the forest.
- Data collection to monitor wildlife.
- Surveillance of the forest to prevent/reduce poaching by outsiders.

The aim was to record ERK for certain mammal species and human activities in the hunting area and to compare with ERKs collected in 2004. This would allow an evaluation of the impact of village hunting on wildlife over a two-year period, while at the same time giving the members of the CWMC training in a simple wildlife monitoring technique. These operations are useful in the set up of their hunting management plan.

3.2 How to:

3.2.1 Use navigation equipment in the Forest

The training on the use of navigation equipments in the forest was carried out by a combination of methods (including brainstorming, group discussion and “strength weakness potentiality and obstacle analysis”), through workshops, meetings and practical sessions in the field. During the workshops, the villagers received training in the following:

- The manipulation of navigation equipments used in the forest, i.e. compass and Global Positioning System (GPS), (figure 4)
- The use of maps for orientation in the forest (map reading, calculation of distance between two points and their identification in the field).
- Opening up and collecting data on transects.
- Surveillance in the forest.

Question and answer sessions were used to identify what the villagers required for the establishment of a participative hunting management plan. During practical sessions, the trainees applied the theory by utilising the navigation equipment to open transects and collect data on mammal populations in the forest.

3.2.2 Collect data for wildlife monitoring

Line transect methodology was used to collect data on wildlife populations in the forest. The area was divided into three blocks; block B at Diassa, block E at Palestine and block M at Mimpala (figure 5). Each block contained 5 transects of about 4 km each making a total of 20 km of transect in block B, 19.15 km in block E and 20km in block M, (figure 5). A team of 4 surveyors; one PGS student and three villagers who were trained by PGS, moved quietly along transects at a speed of approximately 1km per hour. One villager with a compass walked in front of the group to record direct observations of monkeys, their numbers, their sighting distances and angles from the transect. The second villager with a meter tape searched for chimpanzee and gorilla nests and measured the distances of these nests from the transect, the diameter (at breast height) of the trees in which the nests were found, estimated the heights of the trees as well as those of the nests, recorded the vegetation of the area, visibility within the forest at the observation point and the age category of the nests. The third villager searched for footprints, animal dung and signs of human activities along transects. The fourth person walking behind recorded the data onto data sheets. The surveys were conducted from about 7am to 11:30am and species names were recorded in Badjoué (the local language).



Figure 4: Training on the use of navigation equipments in the forest

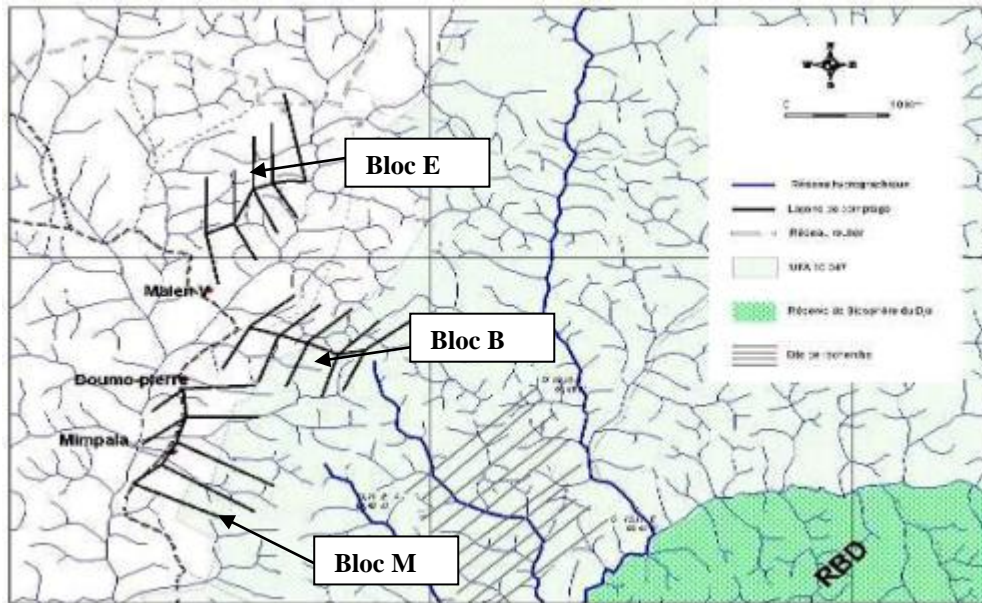


Figure 5: Study site and the line transect.

3.2.3 Do the surveillance of the forest.

Twenty local people were divided into two groups: The monitoring and the vigilance groups, all from the CWMC.

In this section, two key elements were taken into consideration:

- The identification of monitoring routes; This consisted of selecting zones of interest for monitoring, such as areas which are heavily hunted, areas where important and rare animal species were known to exist and different types of forest areas.
- The identification of the animals to be monitored. This included animals that were easily identified and observed, animals whose population could potentially be increased as a result of effective wildlife management and animals, which were important for conservation and local culture.

3.3 Output

One seminar and four workshops including practical sessions in the field organised by PGS under the supervision of the local representative of the Cameroonian authority in charge of wildlife were used for the training.

Sixty kilometres of line transects were cut and direct and indirect observations were made.

3.4 Observation

By receiving theory and practical sessions, the members of the CWMC were able to collect data from transects and through simple analysis, ERK of animals and human activities were estimated. In addition to this, the following observations were made:

1. The villagers were surprised to learn that so much information was contained on a map
2. Most of them were using the compass and GPS for their first time and acquainted themselves with the multiple roles and functions of the equipment.
3. They learned that it was possible to navigate in the forest with the GPS and compass.
4. Myths surrounding the use of such equipment were dispelled once they were able to experience their use for themselves.
5. They realised that they could make use of these devices to estimate the number of animals and the impact of human activities in their forest.
6. They learnt how to use the compass and GPS to open up transects in the forest.
7. They asked for training in other fields and techniques, indicating that they were keen and willing to learn more. They were proud to recount to neighbouring villages the knowledge they acquired and also felt a sense of pride at the wildlife resources they had identified in their forest.
8. They appreciated the training because they realised that they were able to obtain knowledge of scientific methods, enabling them to learn more about their forest.

CHAPTER IV

FAUNAL SURVEYS AND MONITORING OF HUNTING ACTIVITIES

4.1 Introduction

This was the first application of the survey and monitoring team after the training. The aim was to calculate the ERK for certain mammal species and human activities in the hunting area and compare these to ERKs collected in 2004. This would allow an evaluation of the impact of village hunting on wildlife over a two-year period, while at the same time giving the members of the CWMC training in a simple wildlife monitoring technique. This information is useful in the set up of their hunting management plan.

A total of 59.15 km of transect (survey effort) was covered in the three blocks (B, E and M) and 24 mammal species were identified from both direct and indirect observations as shown in table 1 below.

Table 1; Study sites and number of species.

Blocks	B	E	M	Total
Survey effort (km)	20	19.15	20	59.15
Total number of species	24	19	18	24

4.2 Animal abundance: Encounter Rate per Kilometre (ERK)

ERK is the number of species encountered per kilometre covered along transect and is calculated by dividing the total number of indicators by the survey effort (number of km covered) on a transect. ERK provides a crude method to allow assessment of trends in abundance of game species and human activities that can be used easily by the CWMC. It cannot provide accurate data on abundances of game species but can act as a useful tool for local conservation authorities to prioritise their actions in different regions.

ERKs were calculated for the following species: chimpanzee (*Pan t. troglodytes*), gorilla (*Gorilla g. gorilla*), elephant (*Loxodonta africana*), blue duiker (*Cephalophus monticola*), red duikers (*Cephalophus callipygus*, *C. dorsalis*, *C. nigrifrons*), yellow backed duiker (*C. sylvicultor*), sitatunga (*Tragelaphus spekei*) and red river hog (*Potamochoerus porcus*).

We compared the results of the 2004 survey with the 2006 survey carried out by the CWMC and the following observations were made:

4.2.1 Great apes

4.2.1.1 Chimpanzees

There was an overall decrease in the ERK of chimpanzees from 2.86 in 2004 to 1.66 in 2006. Decreases were recorded in blocks B and E, but an increase was recorded in block M as shown in table 2.

Table 2; ERK of chimpanzees (*Pan Troglodytes*).

Species	Block E			Block B			Block M			Total		
	No. of nests 2006	ERK 2006	ERK 2004	No. of nests 2006	ERK 2006	ERK 2004	No. of nests 2006	ERK 2006	ERK 2004	No. of nests 2006	ERK 2006	ERK 2004
Pan troglodytes	12	0.63	3.10	44	2.20	4.80	43	2.15	0.70	99	1.66	2.86

4.2.1.2 Gorilla

The ERK of gorillas for 2004 and 2006 remained unchanged, but there were increases in the values in blocks M and E with a decrease in block B as shown in table 3 below.

Table 3: ERK of gorillas (*Gorilla gorilla gorilla*)

Species	Block E			Block B			Block M			Total		
	No. of nests 2006	ERK 2006	ERK 2004	No. of nests 2006	ERK 2006	ERK 2004	No. of nests 2006	ERK 2006	ERK 2004	No. of nests	ERK 2006	ERK 2004
Gorilla gorilla	1	0.05	0	0	0	0.25	5	0.25	0.05	6	0.10	0.10

4.2.1.3 Elephants

There was an overall increase in the ERK of elephants. Increases were recorded in blocks: M and E, whilst in block B there was no change as in table 4.

Table 4: ERK of elephants (*Loxodonta africana*)

Species	Block E			Block B			Block M			Total		
	No. of dung 2006	ERK 2006	ERK 2004	No. of dung 2006	ERK 2006	ERK 2004	No. of dung 2006	ERK 2006	ERK 2004	No. of dung 2006	ERK 2006	ERK 2004
<i>Loxodonta africana</i>	2	0.10	0	7	0.35	0.35	17	0.85	0.50	26	0.44	0.28

4.2.2 Ungulates

4.2.2.1 Blue duikers

There was an increase in the ERK of blue duiker. Increases were recorded in blocks M and B, with a decrease in block E (ERK of 0).

Table 5: ERK of blue duiker (*Cephalophus monticola*)

Species	Block E			Block B			Block M			Total		
	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces	ERK 2006	ERK 2004
<i>Cephalophus monticola</i>	0	0	0.35	9	0.45	0.25	31	1.55	0.15	40	0.68	0.25

4.2.2.2 Red duikers

An overall increase was recorded in the ERK of red duiker species, with the exception of *Cephalophus nigrifrons* for which an ERK of 0 was recorded. Increases were recorded in blocks M and B, with a decrease in block E as shown in table 6.

Table 6: ERK of red duiker species

Species	Block E			Block B			Block M			Total		
	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004
<i>C. callipygus</i>	0	0	0	3	0.15	0.05	1	0.05	0	4	0.07	0.02
<i>C. dorsalis</i>	0	0	0.10	2	0.10	0	3	0.15	0	5	0.08	0.03
<i>C. nigrifrons</i>	0	0	0.10	0	0	0	0	0	0	0	0	0.03
TOTAL	0	0	0.55	14	0.70	0.30	35	1.75	0.15	49	0.82	0.33

4.2.2.3 Other ungulates

There was a decrease in the ERK of other ungulates. This decrease was observed in all the three species as in table 7 below. There was an increase in block M, no change in block B and a decrease in block E.

Table 7: ERK of other ungulates (*Cephalophus sylvicultor*, *Tragelaphus spekei*, *Potamochoerus porcus*)

Species	Block E			Block B			Block M			Total		
	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004	No. of faeces 2006	ERK 2006	ERK 2004
<i>C. sylvicultor</i>	0	0	0.10	0	0	0	2	0.10	0	2	0.03	0.03
<i>Tragelaphus spekei</i>	0	0	0.05	0	0	0	0	0	0	0	0	0.01
<i>Potamochoerus porcus</i>	0	0	0.10	0	0	0	1	0.05	0	1	0.02	0.03
TOTAL	0	0	0.25	0	0	0	3	0.15	0	3	0.05	0.07

4.2.3 Small primates

Four species of monkey; *Cercocebus agilis*, *Cercopithecus cephus*, *Cercopithecus pogonias* and *Cercopithecus neglectus* were observed directly during the survey. The ERKs of these species were calculated and the results obtained are shown in table 8.

The sum of the ERK of all species indicated an overall increase in their numbers. Increases were recorded in all species except *Cercocebus agilis* which showed a decrease in ERK.

Table 8: ERK of Monkey species

Species	Block E			Block B			Block M			Total		
	No. observed 2006	ERK 2006	ERK 2004	No. observed 2006	ERK 2006	ERK 2004	No. observed 2006	ERK 2006	ERK 2004	No. observed 2006	ERK 2006	ERK 2004
<i>Cercopithecus cephus</i>	9	0.47	0.50	16	0.80	0.50	30	1.50	0.20	55	0.92	0.40
<i>Cercopithecus pogonias</i>	0	0	0.05	6	0.30	0.05	2	0.10	0.05	8	0.13	0.05
<i>Cercopithecus neglectus</i>	0	0	0.05	0	0	0	1	0.05	0	1	0.02	0.02
<i>Cercocebus agilis</i>	0	0	0.10	2	0.10	0.01	0	0	0	2	0.03	0.05
TOTAL	9	0.47	0.70	24	1.20	0.56	33	1.65	0.25	66	1.10	0.52

In general, block M was the richest in all species of animals surveyed, followed by block B and block E.

4.3 Surveillance of the forest.

Monitoring routes:

The hunting area was divided into four main zones:

- The village-hunting zone
- The forest-hunting zone
- The “no take” area
- The research area.

For each zone, 10km of routes was identified and for each area, 2km of transect was followed.

24 species of mammals from 6 orders were identified during the survey.

The survey of human activities was an essential part of the surveillance to obtain an idea of the level of disturbance. Human activities carried out along the transects in the three blocks were recorded during the survey. The ERK of these activities were calculated and the results obtained are as shown in table 9.

There was a slight reduction in human activities in all the three blocks. The main human activities observed were grouped as follows:

- 45 Trails used by villagers
- 26 Active traps
- 23 Trap materials
- 15 Transects of forest exploiters
- 12 Farms
- 11 Palm wine tapping spots.

Human activities in block E increased, while in blocks B and M, there were decreases as illustrated in table 9 below.

Table 9: ERK of human activities along transects.

Human Activities	Block E			Block B			Block M			TOTAL		
	No. Found 2006	ERK 2006	ERK 2004	No. Found 2006	ERK 2006	ERK 2004	No. Found 2006	ERK 2006	ERK 2004	No. Found 2006	ERK 2006	ERK 2004
Tree with bark removed	0	0	0,25	0	0	1	2	0,1	0,25	2	0,03	0,5
Gun Shell	3	0,2	0,15	0	0	0,1	1	0,05	0,05	4	0,07	0,1
Farm	11	0,6	0,25	1	0,05	0,2	0	0	0,4	12	0,2	0,28
Transect of community forest	1	0,05	0,6	0	0	0,5	0	0	0,05	1	0,02	0,38
Active trap	0	0	0,45	24	1,2	0,45	2	0,1	0,05	26	0,44	1,16
Hunting camp	4	0,2	0,3	1	0,05	0,05	0	0	1,5	5	0,08	0,14
Village trail	25	1,3	0,45	2	0,1	0,4	18	0,9	1,4	45	0,75	0,75
Palm wine tapping	2	0,1	0,25	2	0,1	0,25	7	0,35	0,45	11	0,19	0,31
Road of forest exploiters	2	0,1	0,55	0	0	0,3	1	0,05	0	3	0,05	0,28
Tree cut	0	0	0,25	0	0	0,2	4	0,2	0,25	4	0,07	0,23
Transect of forest exploiters	1	0,05	0	17	0,35	0,15	7	0,35	0	15	0,25	0,06
Trap materials	20	1	0	0	0	0	3	0,15	0,3	23	0,39	0,05
Old barrier of traps	0	0	0,1	0	0	0,15	1	0,05	0	1	0,02	0
Hunters trail	2	0,1	0	3	0,15	0	0	0	0	5	0,08	0
Old farm	0	0	0	0	0	0	1	0,05	0	1	0,02	0
Old trap	7	0,4	0	0	0	0	4	0,2	0	11	0,19	0
Piece of cloth	1	0,05	0	0	0	0	1	0,05	0	2	0,03	0
Barrier of fishermen	0	0	0	0	0	0	2	0,1	0	2	0,33	0
Cocoa farm	0	0	0	0	0	0	1	0,05	0	1	0,02	0
Materials used to tap raffia	0	0	0	0	0	0	1	0,05	0	1	0,02	0
Uprooted tree	1	0,05	0	0	0	0	0	0	0	1	0,02	0
Forest burned	1	0,05	0	0	0	0	0	0	0	1	0,02	0
Pit	0	0	0	0	0	0	6	0,3	0	6	0,1	0
Banana/Plantain farm	4	0,2	0	0	0	0	1	0,05	0	5	0,08	0
TOTAL	85	4,45	3,6	40	2	3,75	63	3,15	4,7	188	3,18	4,53

A comparison of the ERK of the 2004 and 2006 results enabled the villagers to manipulate data they collected in different years in the same area. They appreciated the increases and decrease in the different areas and confirmed with their personal observation on the field. They also appreciated the nature of the threats and solutions were easily found to limit or stop the threats.

CHAPTER V

ELABORATION OF A HUNTING MANAGEMENT PLAN BY THE CWMC AND LEGALISATION OF THIS PLAN BY THE CAMEROONIAN AUTHORITIES

The hunting management plan was discussed by the CWMC and the different aspects were taken into consideration. These included the following;

- Management objectives
- Zoning of the hunting area
- Quotas setting
- Rules and regulations for hunting
- Control systems
- Monitoring systems
- Micro projects for development
- Integration of the hunting management plan into the management plan of the DBR

The logical next step was to identify the acquisition procedure for the hunting management plan.

5.1 Acquisition procedure

The manual of procedure for the set up of community hunting zones elaborated by the authorities in charge of wildlife and flora recommend the following points:

- To organize constituent meetings and public awareness,
- To compile the Application file,
- To submit and process the application file

5.1.1 Public Awareness

Because the community has a right to be informed of the proposed process by MINFOF, since 2001 PGS through his local collaborators and the help of a legal adviser had set up a sensitisation and public awareness programme that was focused on key issues:

- Relevant key elements of the Wild life law/Decree
- Importance of conservation and sustainable utilisation of wildlife resources
- Existing Opportunities for CWMC
- Key elements and requirements for acquisition

5.1.2 Preparatory Meetings

Preparatory meetings took place under the supervision of PGS staff and the local representatives of the ministry of forestry and wildlife. The CWMC was formed and legalised. Internal rules and regulations were discussed and adopted.

5.1.3 Constituent Meeting

Participants and their roles at this meeting shall comprise the following:

- Local Administrative Authority

Within the mandate of Section 27 of the Decree, the local administrative authority is in charge of supervising the constituent meetings and for this purpose shall:

- * Convene the meeting through public notices
- * Preside over the meeting
- * Ensure the attendance or representation of all participants as defined above
- * Adjourn sessions to ensure compliance with the specified requirements

- Local Wildlife Service

- Shall provide technical assistance

- Shall ensure that the legalised entity through this process acquires accreditation, as a recognised organisation of the Ministry and for this purpose shall ensure that all requirements are produced by the entity.

- All relevant technical ministries.

Other actors (Ministry of agriculture, NGOs, Projects, etc) interested in providing assistance to the community or the entire process

- Public Notices

Public Notices for constituent meetings shall be issued by the local administrative authority and shall state the date, place, time and agenda

Notices shall be pasted at the Council office, the Office of the Prefect for the Sub-Division, Office of the local Wildlife Service and the Chief's Palace.

- Organisation of constituent Meeting

From the provisions of Section 27 (1) (2) of the Decree, the business (agenda) of the Constituent Meeting shall be focused on:

- * Determining the objectives of the legal entity
- * Defining the boundaries for community hunting zones requested
- * Adoption of a Constitution and Internal Regulation,
- * Adoption of the appointed Competent Manager
- * Ensuring a representation of all social groups

Minutes of the constituent meeting shall be recorded and signed by all the participants

5.1.4 Compiling the Application file

In compliance with Section 28 of the Decree, the required documents for an application file shall comprise:

- * A certified copy of the Minutes of Constituent Meeting
- * Constitution/Internal Regulations
- * Sketch plan of proposed hunting ground

- *A list of the objectives of the management plan
- *A C.V in proof of the competence of appointed Manager
- *Application letter, stamped and addressed to the Minister
- *Registration Certificate or a receipt thereof.

5.1.5 Submission and processing of application file

-Define role and responsibility of MINFOF external services.

Services involved include the divisional delegate and the provincial delegate in charge of wildlife. Their roles are to process the application file after verification.

-Define role and responsibility of MINFOF Central Services.

Services involved include the Director of Wildlife and the Community Wildlife Management Unit. Their roles are also to verify and approve for the signature by the minister in charge of wildlife.

CHAPTER VI

MONITORING OF AGRICULTURAL ACTIVITIES

The results of the socio-economic studies carried out in 2002/2003 revealed a division of agricultural activities into two groups based on sex. Men were engaged in cocoa farming and women in crop farming.

A comparison of the subsequent outputs of cocoa between 2002 and 2005 showed a drop of 66% in 2003, 73% in 2004 and 59% in 2005. The diagnostic of this situation by the CWMC highlight the following problems:

- Plantations were very old (created between 1940 and 1965)
- Lack of technical advisors
- Laziness
- Destruction of the production by rodents (squirrels)
- The drop of price of cocoa due to economic crises in Cameroon

The CWMC, in order to change the current trend in cocoa farming couple with the incentive campaign by the Cameroonian government to reactivate this activity in the country, decided to set up a regeneration programme of old plantation with new high yield specie of cocoa. Under the supervision of the CWMC and the local representatives of the ministry of agriculture, nurseries have been set up in the six villages (Malen V, Doumo-Pierre, Mimpala, Ntibonkeh, Eschou and Madjuh 1) involve in the PGS approach.

Women are organised in groups and their main activities are crop production (Figure 6), local micro-finance organisations and “njangi” (group contributions).

The food produced is mostly for local consumption due to the remoteness of the area.



Figure 6: Women group

CHAPTER VII

ANALYSIS OF THE FUNCTIONING OF THE MANAGEMENT COMMITTEE IN THE FIRST THREE VILLAGES AND POTENTIALS TO SET UP CONTROLLED HUNTING IN THE SECOND GROUP OF THREE VILLAGES.

The members of the CWMC met for the diagnostic, functioning and restructuring of the two years activities of CWMC. During The outcome of this general assembly held in Malen V is summarized as follow:

Positive points:

1. Legalisation of the CWMC by the Cameroonian authorities,
2. Local awareness of sustainable use of natural resources,
3. Organisation of workshops, seminars and training on the use of navigation equipments and mammal survey in the forest,
4. Discussion on the set up of the hunting management plan,
5. Discussion on anti-poaching activities,
6. Identification and follow up of micro projects for development.

Negative points:

1. Lack of creativity by members of the executive bureau of the CWMC who only waits for PGS to initiate
2. Incapacity of the executive bureau to create contacts with other partners such as FipCam
3. Lack of a team spirit among the executive bureau
4. Poor management of community account.

Functioning

The lack of team spirit renders the functioning of the CWMC heavy and slow.

Restructuring

Some modalities of the status should be amended. Team spirit should be developed in order to facilitate communication on the activities of the CWMC and allow all the members to participate.

CONCLUSION AND RECOMMENDATIONS

The CWMC remained a corner stone in the process of the implementation of a participatory management plan for hunting at the periphery of the DBR. From the presentation of their activities (2004/2006) in the neighboring villages that showed official interest to integrate the ICDP, the neighboring villagers realized that the CWMC was more advanced in forest resource management.

Through training of the CWMC on mammal survey, myths surrounding the use of navigation equipments by the villagers and the implementation of a hunting management plan in their forest were dispelled.

The survey showed that the study area is quite rich in mammal populations but poaching activities mostly by external hunters resulted to decreases in the populations of some species. Coupled to this, the transition phase of ECOFAC during which its activities were halted equally gave room to external hunters who went further with poaching activities in the area. Despite the remoteness of the area, the recent importation of Chinese motorbikes to Cameroon rendered it quite accessible. Poachers used these bikes to supply hunters with wire and cartridges and also to buy and transport bush meat. This expressed the need to set up a concerted anti-poaching activity at the periphery of the DBR.

With the help of the Booster grand, we were able to identify the acquisition procedure for the set up of a hunting management plan. The Whitley award will help us to legalise the plan according to the Cameroonian law by September 2007.

The success of this plan will somehow depend on the set up of appropriate alternatives activities to hunting. Cocoa farming for men and crop farming for women has been identified as the two major activities. The promotion of these two activities will likely have a positive impact on the livelihood of the local people. Women are organise and are engage in activities such as:

- Cleaning of cocoa plantations
- Cleaning of village roads
- “Njangi”
- Cultural activities
- Crops cultivation

Because of the bush meat crises and the need to fight against poverty, the CWMC requires a special organisation and structure for self-management. They equally need to be empowered by the local authorities in charge of wildlife. Thanks to the Whitley award, the CWMC will still be supported in the context of helping them to develop partnership with other associations, projects, logging exploiters and authorities in charge of forestry and wildlife.