

The Lebialem Highlands Montane Birds' Conservation Project, Cameroon

Final Report



Conserving wildlife and protecting fragile environments



Roger Skeen with students at birds training course

Prepared by

**Louis Nkemi, Roger Skeen and Denis Ndeloh
The Environment and Rural Development Foundation
South West Cameroon**

**For
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Executive Summary

A 12-month montane conservation education project on Lebialem Highlands, Cameroon funded by the Rufford Foundation was initiated in January 2004. This project extended into 2005 with supplemental funding from the African Bird Club c/o BirdLife International and Fauna and Flora International. The project sought to initiate the restoration of the depleted bird populations, and protect their threatened ecosystems. The specific project objectives included i) to train and build capacity of youths and community leaders towards the conservation of montane birds and management of their ecosystems ii) to increase community awareness and commitment on the conservation of the montane birds iii) to promote and build community-based institutions iv) To further the understanding of the montane birds of Lebialem highlands through research v) to develop conservation education packages for the area.

The project activities conducted during the period included i) conducting baseline surveys and household surveys to understand local people's attitudes towards birds conservation ii) training of youths and community leaders iii) development of community leadership, iv) information dissemination and v) community support building through introduction of conservation incentives.

The main outcomes of the project included designation of 12 key sites for the permanent protection and conservation of the montane birds and their ecosystems ii) 3000 students and 1000 youths were reached through this project iii) 5000 adults (men and women) were also reached through this programme iv) 355 birds species were recorded out of which 14 were IUCN listed species, 26 restricted range species and over 50 montane endemics v) a student poster contest was organized and prizes awarded, this led the students to become more than ever before interested in birds' conservation issues vi) a student calendar was produced, a manual of some endemic and IUCN listed birds found in the highlands produced vii) numerous education and sensitization events were organized viii) a new subpopulation of gorillas discovered in Bechati-Fossimondi forest ix) two community-based associations were formed respectively for the conservation of birds and for forest restoration x) there was general increased awareness among the local people on the need to conserve birds and protect their ecosystems. The President of the local community-based birds' conservation association was offered a binoculars for bird watching and monitoring xi) 6 new school conservation clubs were formed

The major recommendations resulting from this project include i) the upscaling of the project to create the Lebialem Highlands Forest Landscape Restoration and Conservation Programme ii) strengthening the institutional and technical capacity of the created community-based forest management institutions iii) developing a financial sustainability scheme for these institutions iv) facilitating the community livelihood scheme v) strengthening the conservation education component vi) conducting more birds' surveys in other identified areas vii) creation of community forests in designated key sites for the conservation of the montane endemics and viii) development of a community-based eco-tourism programme based on birds' and wildlife watching as well as the aesthetic value of their natural environments..

Acknowledgements

We extend our gratitude to Rufford Foundation, the African Bird Club, and Fauna and Flora International, who provided the financial assistance that, permitted this work to be carried out.

Special thanks go to Mr Roger Skeen whose expertise and availability permitted him to lead the implementation of the birds' survey component of this project.

Many people assisted us in one way or the other during this field work. We want to extend our heartfelt appreciation to all the Fons, Chiefs, traditional council members, elites and youth leaders. In all the communities we worked with their help, hospitality and significant contributions during the surveys.

The local people trained in field ornithology by ERuDeF were very instrumental to the success of this project in their respective villages. We appreciate their interest in bird conservation as well as their collaboration and hospitality. More especially, we extend sincere thanks to all the local guides and porters whose assistance were truly indispensable.

We are also very grateful to Mrs Skeen who assisted with an additional pair of binoculars. This kind gesture of hers was very instrumental to the out come of this work.

The African Bird songs recorded on CD disk brought by Mr Jaap Van de Waarde enabled us to identify some shiny species. We thank him for this support.

We are grateful to James Nwese for assistance in data analysis.

1.0 Introduction

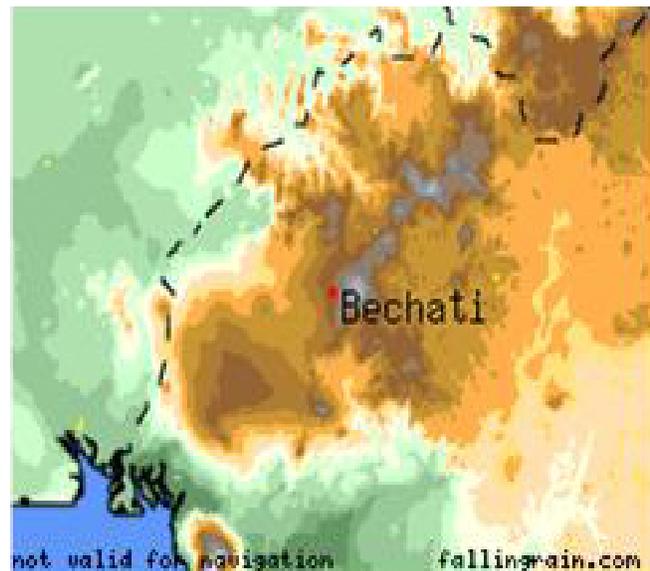
1.1 Background

This 12-month project sought to initiate the restoration of the depleted bird populations, and protect their ecosystems. The project activities included training of youths, development of community leadership, research, information dissemination and support building. The desired outcomes included increased population of the birds, sustained improvement in local knowledge, attitudes and behaviour and greater support for, and involvement in, the management process of the birds. The activities began in January 2004 with the holding of a planning meeting in Kumba. During the meeting, the activities were planned and prioritized. The activities ran throughout 2004 and into 2005 given that the project received additional financial support from the African Bird Club and the Fauna and Flora International.

1.2 Description of the Western Cameroon region

The Cameroon-Nigeria cross-border forests are extra-ordinary diverse with a high degree of endemism (Davis et al, 1994). This area is heavily influenced by drainage patterns and topographical features. This forest is home to the last populations of Cross River gorilla in Cameroon (*Gorilla gorilla deihli*) (Sunderland-Groves et al, 2003). It has been observed that the cross-border area is floristically diversified when compared to other forests in the Guineo-Congolian region (Terry et al, 2003). This project area ranges from 180m to 2900m above sea level, thus conferring a high degree of vegetation and mammalian diversity and as well as the ecosystems and endemism (Nkembi, 2004). The region is shown in Figure 1 below.

Figure 1: Map of western Cameroon region showing the mountains chain and Bechati in Lebialem region



The wider biodiversity of this forest area including vegetation remained unstudied except for the Takamanda Forest Reserve (Nkembi, 2004), although it was speculated that because of the transition from lowland forest to montane savanna, the area would be particularly diverse for all biological taxa (Gartlan, 1989).

Rainfall varies from 1500-10000mm per annum giving rise to a variety of vegetational floristic regions (White, 1983). This area contains 84 % of known African primates, 68 % of known African passerine birds and 66 % of known African butterflies (Groombridge and Jenkins, 2000). This area has been classified by WWF as a biodiversity hotspot and one of the Global 200.

Floristically, this area forms part of the Hygrophyllous Coastal Evergreen rainforest which occurs along the Gulf of Guinea. The vegetation sub-unit is associated with high rainfall levels (White, 1983) and is part of the Cross Sanaga-Bioko Coastal Eco-region, an area of 52000 sq km (Osion et al, 2001; WWF US, 2001). The ecoregion is considered an important centre of plant diversity because of its probable isolation during the Pleistocene (Davis et al, 1994).

The dry season runs from November to April and the rainy season from May to October. The annual rainfall averages 3000- 4000mm. The annual temperature is 27 degrees Celsius.

1.3 Description of the Lebialem Highlands

The Lebialem Highlands is located on the mountainous northeastern part of South West Province. It is bordered to the East by West Province, South and South West by the Banyang – Mbo Wildlife Sanctuary (BMWS) and North by Momo Division in the North West Province. The area ranges from 180m to about 2510m a.s.l. It is situated between latitudes 5°11” and 5° 45” and longitudes 9° 50” and 10° 00”. Lebialem covers a land area of 1323 km² with an annual average rainfall of 2000-3000mm that usually comes in torrential down pours. This region is shown in Figure 2 as Bangwa.

Figure 2: Map of Lebialem Highlands in the South West Province of Cameroon



Lebialem Highlands have a number of mountain ranges notably the mantal range (2303m) and Magha Hill (2510m) in the Northern most part, Nyi Fongonkem (1700m), Nyitebong (1560m), etc. The area runs from a low – lying area of 180m in the Mamfe basin to the height of 2510m on the Western side of mount Bamboutous in Western Cameroon. Lebialem Highlands region is one of the most accidental landscapes with very fragile ecosystems, within the

western highlands of Cameroon characterised by several isolated peaks and steep valleys. Currently the area being targeted has no legal management status. There are three major forest blocks to consider here namely: i) Bechati-Fossimondi-Besali forest block ii) Mak-Betchou forest block and iii) Nkingwa Hills and four major montane forest blocks namely i) Fomenji/Magha ii) Fossimondi-Besali iii) Attulleh/Nyitebong iv) Mbindia-Quibeko-Lechotaw Triangle and v) Ngoh-Betchou forests.

1.4 Legal and National Policy Framework of the project

Project number 12 in the Cameroon's Forestry Action Programme relates to the protection and management of the afro-montane forests of Cameroon. This project no. 12 is considered to be very relevant to the Lebialem Highlands context. These highlands represent the last remnants of primary rainforest and montane vegetation across the western slopes of the Bamboutous Mountain and Bamilike Plateau. The objectives of Project no. 12 include i) to assess the vegetational and fauna potentials of afro-montane forests and ii) to protect the biodiversity of the afro-montane areas of Cameroon in order to safeguard the endangered and endemic species.

The National Biodiversity Strategy and Action Plan of 1998 with reference to the montane ecosystems has as objectives i) to ensure the sustainable management and exploitation of montane biodiversity ii) to build, develop and strengthen capacity at all levels to manage and protect montane forests ecosystems biodiversity and its component parts iii) promote traditional knowledge of montane biodiversity and its component parts and their socio-economic importance and values.

From the foregoing, this project helps to reinforce both the national priority and articulates on the WWF Libreville 2000 priority setting meeting which recognized the Cameroon- Nigeria cross-border area as a region of priority and one that needed to be focused on with the aim of understanding where priorities lie at the specific sites.

1.5 Contribution of project to biodiversity conservation and habitat protection

Through the designation of permanent land-use areas such as the proposed community forests, wildlife reserves and ecological reserves throughout the highlands range, this project will be helping to arrest the problem of habitat destruction and forest fragmentation. These are sites that are home to endangered and threatened species of birds, mammals, great apes, reptiles and amphibians. The proposed designation of the Lebialem Highlands as a candidate for a protected area known as the Technical Operational Unit (TOU) further adds credence to the contribution of the project to biodiversity conservation. The project has also been able to come out with a major list of biodiversity species, the first of its kind in this area and a great contribution to further understanding the biodiversity of Cameroon's montane areas.

1.6 Project Team

1. Project team leader : Louis Nkembi
2. Project Botanist: Terence Atem
3. Project Zoologist: David Lekeaka
4. Project Education Coordinator: Mike Fonjia
5. Environment Education Officer: Denis Ndeloh

6. Freelance ornithologist: Roger Quinton Skeen

7. Associated Institutions: Ministry of Environment and Forestry, WCS/Cross River Gorilla Research Project-Cameroon and Watershed Task Group (local NGO).

1.7 The Goal of the Project

The purpose of this project was to seek the restoration of the depleted birds' populations and to protect their ecosystems.

1.8 The Objectives of the Project

The specific objectives include the following:

- i. To train youths and develop community leadership and commitment towards the conservation of montane birds and protection of their ecosystems.
- ii. To further dissemination of information on montane birds and support building of community-based institutions
- iii. To further the understanding of the montane birds of Lebialeme highlands through research and education
- iv. To provide conservation incentives to the local communities through initiation of livelihood development activities.
- v. To develop an innovative approach for the implementation of environmental education.

2.0 Methodology

2.1 The Description of the Surveyed Sites

2.1.1 Fossimondi Forest

Fossimondi is located in the Northwestern part of Lebialeme Division and lies south west of the Bamboutous Mountains. It lies within the Cameroon volcanic line with a characteristic fragile landscape characterized by frequent occurrence of landslides. It is found along the leeward side of the Bamboutous Mountains with a high annual rainfall (>2000mm).

The entire Fossimondi area is characterized by hilly outcrops up to 2400m, and savanna grassland beyond. Few patches of primary montane forest are dotted within the topographical range of 1600m-1950m. The dominant vegetation is savanna grassland and a large secondary forest found to the south. Portions of the secondary forest and farm fallows extends southwards, merging with the primary forest from Besali and Bechati. This area forms a water catchment zone supporting important biodiversity and constitutes the Bechati-Fossimondi-Besali forest block.

Bush fires constitute a major threat to the survival of the remnants of montane forests which make the last stronghold of biological diversity. The montane forest here is home to many endemic plants and birds like the Bannerman's Turaco, Banded-Wattle eye, Bangwa Forest Warbler and the Bannerman's Weaver.

2.1.2 Bechati -- Besali Forest.

The Bechati-Besali forest lies southwest of Menji town and to the west of the Tinto – Menji road axis. It also lies adjacent to the Northwestern part of the upper Banyang logging concession (UFA 0012) presently under exploitation. This forest merges with the Fossimondi forest located to the north. This area represents the south western half of the last intact forest block representing the montane, submontane and lowland forest formations in the Western Bamboutous Mt area.

The lower elevation forest is being invaded by the local people and many oil palm and cocoa plantations have been established. An intact primary forest still exists in the higher altitudes where no suitable timber tree species are found or where the delicate nature of the terrain made exploitation impossible. The smaller streams from the highland areas of Fossimondi, Mmouckbie, and the southern part of the Bamboutous Mountains flow downwards and gradually coalesce as they approach the lowland forming large rivers which eventually flow to join the Cross River at a later stage. These rivers in Bechati and Besali act like a reservoir for fish and other aquatic resources that constitute a major source of protein for the local people.

2.1.3 Mak – Betchou Forest

Mak-Betechou forest area is located at the extreme south of Lebialem Division and lies northeast of Kupe-Muanenguba Division. It is also bordered to the southwest by Upper Banyang in Manyu Division. A large network of streams and rivers exist in this site and constitutes a significant source of water bodies that coalesce to join the Manyu River at a subsequent stage. The Betchou River forms the southwestern border between Lebialem and Kupe-Manenguba. River Betenten separates the Division from Manyu while another large River Mak bisects part of this forest known as Mbin-Mak and flows south westward to join River Manyu. The Mak-Betchou forest is found in Fontem Subdivision and is surrounded by various villages from the Fondoms of Lebang, Essoh-Attah and Njogwi. The forest area rises upto 1400m above sea level. The terrain is gently undulating in the lowlands but rises sharply in the northern and eastern parts of the forest.

This forest block estimated at more than 20 000 ha remains the last the largest intact lowland rainforest in the Lebialem Highlands region. The low population density estimated between 8-15 persons/km² within and around this forest is certainly responsible for the slow deforestation in this area. Another contributing factor is lack of access roads into the area. Despite the enclave nature of this area, the people especially villages adjacent to the forest are becoming more involved in farming and fishing.

2.1.4 Mbindia and Nyitebong Hills Forest

The Mbindia hill is locally known as “Nyi-Fongonkem”, while its sister hill is called “Nyitebong”. The Mbindia Hill has an altitude of 1700m. The neighbouring Nyitebong Hill has an altitude of 1600m. Both Mbindia and Nyitebong Hills lie northeast of Menji town in Lebialem division and southeast of Ngundeng in Menoua Division. It lies along an escarpment that resembles a semi-circular Caldera which stretches along the north and north-eastern border of Lebialem highlands region and commences from Batibo in the Bamenda highlands passing through the Bamboutous Mountain, Bamilike plateau and merging with the Kupe-Muanenguba Mountains in the east. These Hills found within the

semi-circular caldera fall along the Cameroon volcanic line have a long history of landslides' disasters. These two conspicuous Hills are made up of a large mass of rock colonized by submontane and montane vegetation. A substantial portion of the primary forest on both hills still remains intact due to the inaccessibility of the hills and the attitudes of the adjacent local population towards conservation. The Nyi-Fongonkem has an outstanding long history of cultural and eco-touristic importance in Lebialem Highlands region. Nyi-Fongonkem, with a sacred site and its associated sacred forest serves as a place for offering traditional rites and rituals. This forest has a high ethnobotanical importance and it is frequently visited by herbalists in the region.

2.1.5 Atullah Escarpment Forest:

Atullah escarpment forest lies northeast of Menji town and south of Ngundeng along the border with Menoua division in the West province. Found in Lebialem Division, it lies on the southeastern fringe of the Bamileke plateau. Atullah is bordered to the south by Mbeoh, to the east by Mbindia, and north by Ngundeng in the West province. It shares the norther border with the Western Province from the Lewoh fondom.

The dominant vegetation is grassland but several blocks of primary and secondary forests exist in the area. Apart from the primary forest found at the entrance to the Chief's palace, all other blocks of primary forest are found on very hilly, steep and inaccessible slopes. The primary forest here is a typical montane forest rich in non-timber forest products and remains the major water catchment being developed for the potable water supply for the entire Lewoh Fondom and adjacent villages. This forest is a sacred forest used for cultural and traditional activities in the village. The bulk of the grassland savanna extends northwards and merges with the savanna grassland of the Bamileke plateau in Menoua division.

2.1.6 Quibeko plateau forest

This plateau is located to the North east of Mbindia Hills. The submontane forest rises upto 1780m high. Much of the plateau has been deforested for farming. The plateau moves eastwards to join with the Santchou Cliff in the West Province and the Nkingwa hills and west wards to join with the Attullah escarpment. It holds a good number of globally threatened birds' species.

2.1.7 Nkingwa Hills

They rise upto 1840m. They form the last portion of the Lebialem Highlands. They descend southwards to join the Mbo plain. These hills are home to numerous afro-montane endemics and great apes as well as other endangered biodiversity species such as the leopards.

2.1.8 Lower Foto Forest

This forest is located to the south of the Bechati-Fossimondi-Besali forest. It is bordered to the south by a logging concession. It is home to the Red-headed Picathartes. It rises upto a height of 800m.

2.1.9 Menji and Lebialem Falls

Menji and Lebialem Falls are located to the south of the Lebialem Division. The Lebialem Falls, 200m high still have a small remnant forest lodging several interesting birds' species.

2.1.10 Fomenji/Magha Forest

This montane forest found at an attitude of 2500 is home to one of the most important afro-montane avifauna population in on the Cameroon Mountain chain. The montane forest here measures about 400 ha.

2.2 Key Project Activities

The following key project activities were conducted during the project execution period.

- i. Detailed birds surveys
- ii. Training of youths, students and community leaders
- iii. Creation and extension of school clubs
- iv. Development of class room materials on birds (a manual of endangered birds, manual of all Lebialem birds, a poster of some montane birds prepared)
- v. Production of a calendar of students birds contest
- vi. Creation of forest management institutions
- vii. Montane birds students poster contest
- viii. Develop montane birds identification poster
- ix. Special events to improve local knowledge and encourage positive attitudes towards birds conservation e.g. international days, symposia, etc
- x. MINEF staff training and meetings

2.3 Field Methods

Surveys

The reconnaissance survey method (recce method) was used. We surveyed several sites across Lebialem Highlands. A total of seventeen sites were surveyed.

These reconnaissance surveys enabled us to obtain basic information on three taxa (mammals, plants and birds), necessary to determine the biological richness of the area.

Community meetings

Meetings were held in each of the key sites selected for surveys. The main approaches used included community meetings, interviews granted to key informants (hunters, farmers, elders, and herbalists) and forest surveys. Prior to surveys at each site, community meetings were organized involving members of the traditional councils and community representatives to inform and solicit their support. During each meeting, we explained our objectives to the community, planned for fieldwork and obtained valuable socio-economic information relating to the forest and the birds through discussions with the community members. In all sites, we held brief meetings with Forestry and Administrative officials to explain our objectives and obtain permits. Local community people were used as guides / research assistants during the surveys. Relevant elementary socio-economic information associated to the forest sites and biodiversity in this region was also obtained.

School education sessions

Formal lectures on environmental education were held in the secondary institutions throughout the Highlands.

Training workshops

A number of training workshops were held both for youths/students and for representatives of community-based forest management institutions through out the highlands. These also formed part of institutional and capacity building.

Students' contests

In order to increase the dissemination of information on montane birds, a contest was organized among the schools in the region. Students were asked to sketch birds they knew best and which were located nearest to them. 83 students entered the contest and 5 students (2 girls and 3 boys) won the contest. Five additional conciliatory prizes were added and all were given on 5th June 2004 during the World Environment Day. These ten students were then asked to use the information they have obtained to draw a calendar of montane birds for the Lebialem region. This was presented during the training workshop on montane birds conservation.

Organisation and participation in public events

The students were involved in the following public events namely the National Youth Day of 11th February 2004, World Tree Day of April 2004, World Environment Day of June 2004.

Capacity and institutional building

The project facilitated the formation of community-based networks of conservation leaders across the highlands. Furthermore, the project started building their capacity through organisation of training workshops and education and sensitization meetings.

Other methods

Regional networking

A number of meetings were initiated with regional partners such as Birdlife International/Bamenda Highlands Forest Project, Western Highlands Nature Conservation Network (Whinonet), Watershed Task group (WTG) and the Wildlife Conservation Society (WCS), an international conservation organisation working in the region in the domain of wildlife conservation.

3.0 The Project Results

3.1 Biological Surveys

3.1.1 Birds

In order to better understand the status of the montane birds' populations within the highlands region, ERuDeF solicited and obtained a British Freelance birdwatcher in January 2004. His role was to conduct a thorough survey of the key montane forest sites and to produce a checklist of the birds of these sites. These birds' information was very vital for us to use in montane education and training programmes which were to be implemented in the course of the year. In the second half of January 2004, a British birdwatcher, Roger Skeen, joined the team for an 18-month period. Roger and ERuDeF team member Denis Ndeloh, conducted birds surveys in the following sites across Lebiale Highlands: Menji, Mbin-Mak, Lechotaw, Njentse, Lebiale Falls, Ngoh, Nkingkwa Hills (Njongo, Fonki, Leboh, Fowung), Quibiko, Mbindia, Attullah, Nyitebong, Fossimondi, Fomenji, Magha, Bechati, Besali, Lower Foto (Ndoumbin). Over 355 birds were recorded including birds of prey, afro-montane and Guino-Congolian threatened and endemic species. Thirteen globally threatened species (IUCN, 2002) were recorded and one data deficient species also recorded. New range extensions were recorded in most of western Bamboutous Mountain area. Table 1 below shows the species number per site.

Table 1: The number of species recorded per site, afro-montane species and the number of threatened species (IUCN listed).

Sites	Species richness	Altitude (m)	Montane species	IUCN listed species
Fomenji	92	2300	92	5
Magha	57	2500	57	3
Fossimondi	86	2000	86	5
Besali	84	700	0	1
Bechati	100	500	0	0
Lower Foto	68	700	0	1
Mbindia	87	1600	65	5
Attullah	106	1890	90	2
Quibiko	76	1780	80	3
Mak-Betchou	219	1100	56	2
Lechotaw	79	1000	70	6
Ngoh	67	1500	89	1
Nkingkwa Hills	118	1790	70	4
Lebiale Falls	60	200	0	0
Total				

The survey took place from ending January 2004 to early 2005. During this period, 355 species were recorded of which – are restricted to the afro-montane areas. Twenty six of these afro-montane species are considered as restricted range species (BirdLife

International, 2003). These ones being of major conservation importance are shown in Table 2 below.

Table 2 shows the list of restricted range species of Lebiale Highlands

Serial No.	English Names	Scientific Names
1	Cameroon Olive Pigeon	<i>Colomba sjostedti</i>
2	Cameroon Montane Greenbul	<i>Andropadus montanus</i>
3	Western Mountain Greenbul	<i>Andropadus tephrolaemus</i>
4	Cameroon Olive Greenbul	<i>Phyllastrephus poenis</i>
5	Grey-headed Greenbul	<i>Phyllastrephus poliocephalus</i>
6	Mountain Robin Chat	<i>Cossypha isabellae</i>
7	Crossley's Ground Thrust	<i>Zoothera crossleyi</i>
8	Chubb's Cisticola	<i>Cisticola chubbi</i>
9	Green Longtail	<i>Urolais epichlora</i>
10	Grey Apalis	<i>Apalis cinerea</i>
11	White-tailed Warbler	<i>Poliolais lopezi</i>
12	Black-capped woodland warbler	<i>Phylloscopus herberti</i>
13	African Hill Babbler	<i>Pseudoalcippe abyssinica</i>
14	Cameroon Sunbird	<i>Cyanomitra oritis</i>
15	Green breasted Bush-Shrike	
16	Yellow-breasted Boubou	<i>Laniarius atroflavus</i>
17	Little Oliveback	<i>Nesocharis shelleyi</i>
18	Forest swallow	<i>Hirundo fuliginosa</i>
19	Red-headed Picathartes	<i>Picathartes oreas</i>
20	Rachel's Malimbe	<i>Malimbus racheliae</i>
21	Grey-throated Greenbul	<i>Andropadus tephrolaemus</i>
22	Bangwa Forest Warbler	<i>Bradypterus bangwaensis</i>
23	Brown-backed Cisticola	<i>Cisticola discolor</i>
24	White-throated Mountain Babbler	<i>Kupeornis gilberti</i>
25	Cameroon Blue headed Sunbird	<i>Cyanomitra oritis</i>
26	Bannerman's Weaver	<i>Ploceus bannermani</i>

The Afro-Montane Endemics on Lebialem Highlands

The afro-montane endemic species recorded during the birds' surveys of 2004 and 2005 are shown in Table 3 below.

Table 3: List of afro-montane endemics recorded during the surveys

Status	Species	Sites recorded
	Cameroon Olive Pigeon (<i>Columba sjosledti</i>)	Mbindia, Attullah, Fomenji,
	Western Mountain Greenbul (<i>Andropadus tephrolaemus</i>)	Fomenji, Lechotaw, Betchou, Quibeko, Mbindia, Magha
	Lemon Dove (<i>Columba larvata</i>)	Bechati, Betchou
	Bar-tailed Trogon (<i>Apaloderma vittatam</i>)	Quibeko, Mbindia, Nkingkwa Hills
	Western Green Tinkerbird (<i>Pogoniulus coryphaeus</i>)	Lechotaw, Quibeko, Fomenji, Fossimondi
	Elliot's woodpecker (<i>Dendriopicos elliotii</i>)	Fomenji, Fossimondi
	Grey Cuckoo Shrike (<i>Coracina caesia</i>)	Quibeko, Fomenji, Attullah
NT	Cameroon Montane Greenbul (<i>Andropadus montani</i>)	Betchou, Quibeko, Mbindia, Lechotaw, Fomenji, Fossimondi, Attullah
	Western Mountain Greenbul (<i>Andropadus tephrolaemus</i>)	Nkingkwa Hills
	Cameroon Olive Greenbul (<i>Phyllastrephus poensis</i>)	Lechotaw, Betchou, Quibeko, Mbindia, Magha, Fossimondi, Nkingkwa Hills
	Mountain Robin chat (<i>Cossypha isabelle</i>)	Quibeko, Fossimondi, Nkingkwa Hills
	African Yellow Warbler (<i>Chloropeta natalensis</i>)	Fomenji, Fossimondi
	Green Longtail (<i>Urolais epichlora</i>)	Fomenji, Betchou, Quibeko, Mbindia, Bechati, Fossimondi, Nkingkwa Hills
	Black-collared Apalis (<i>Apalis pulchra</i>)	Fomenji, Magha, Fossimondi
	Black-capped Woodland Warbler (<i>Phylloscopus herberti</i>)	Quibeko, Mbindia, Fomenji, Nkingkwa Hills
	Black-Throated Apalis (<i>Apalis jacksoni</i>)	Lechotaw, Quibeko, Mbindia, Fomenji, Fossimondi
	Grey Apalis (<i>Apalis cinerea</i>)	Betchou, Quibeko, Mbindia, Fomenji, Magha, Fossimondi, Nkingkwa Hills
	Blue-Bellied Crested Flycatcher (<i>Trochocerus niten</i>)	Mbindia, Lechotaw, Nkingkwa hills
	White-Bellied Crested Flycatcher (<i>Elminia albiventris</i>)	Lechotaw, Quibeko, Mbindia, Fossimondi, Nkingkwa Hills
	Grey-Chested Illadopsis (<i>Kakamega poliothorax</i>)	Nkingkwa Hills
	White-Bellied Tit (<i>Parus albiventris</i>)	Quibeko, Mbindia, Fomenji, Fossimondi
	Cameroon Sunbird (<i>Cyanomitra oritis</i>)	Lechotaw, Quibeko, Mbindia, Fomenji, Nkingkwa Hills
	Pink-footed Puff back (<i>Dryoseopus angolensis</i>)	Betchou,
	Mountain Sooty Boubou (<i>Laniarius poensis</i>)	Betchou, Quibeko, Mbindia, Fossimondi, Nkingkwa Hills
	Yellow-Breasted Boubou (<i>Laniarius atroflavus</i>)	Lechotaw, Quibeko, Mbindia, Fomenji, Magha, Fossimondi, Nkingkwa Hills
	Waller's Chestnut-winged Starling (<i>Onychognathus walleri</i>)	
	Baglafaecht Weaver (<i>Ploceus baglafaecht</i>)	Mak, Lechotaw, Betchou, Quibeko, Mbindia, Fomenji, Magha, Fossimondi, Nkingkwa Hills
	Black-billed Weaver (<i>Ploceus melanogaster</i>)	Betchou, Quibeko, Mbindia, Fossimondi
	Brown-capped Weaver (<i>Ploceus insignis</i>)	Betchou, Quibeko, Mbindia, Fomenji, Fossimondi, Nkingkwa Hills
	Yellow-bishop (<i>Euplectes capensis</i>)	Magha, Fomenji, Fossimondi

	Northern Double-collared Sunbird (<i>Cinnyris reichenowi</i>)	Lechotaw, Quibeko, Mbindia, Lower Foto, Nkingkwa Hills
	Little Olive Back (<i>Nesocharis shelleyi</i>)	Fomenji, Fossimondi, Quibeko, Attullah, Mbindia
	Red-Faced Crimsonwing (<i>Cryptospiza reichenovii</i>)	Fomenji, Fossimondi
	Chubb's Cisticola (<i>Cisticola chubbi</i>)	Lower Foto, Fomenji, Magha, Fossimondi, Nkingkwa Hills
	Oriole Finch (<i>Linurgus olivaceus</i>)	Lechotaw, Betchou, Quibeko, Mbindia, Fomenji, Magha, Nkingkwa Hills
	Grey-throated Greenbul (<i>Andropadus tephrolaemus</i>)	Mbindia
	Cameroon Blue-headed Sunbird (<i>Cyanomitra oritis</i>)	Attulleh, Fossimondi
	Thick-billed Seedeater (<i>Serinus burtoni</i>)	Quibeko, Mbindia, Fomenji,
	Evergreen Forest Warbler	Mbindia
	Tullberg's Woodpecker (<i>Campethera tullbergi</i>)	Mbindia,
NT	Crossley's Ground Thrust	Mbindia
NT	White-tailed Warbler	Mbindia, Quibeko, Nkingkwa Hills, Attullah
	African Dusky Flycatcher (<i>Muscicapa adusta</i>)	Lechotaw, Betchou, Quibeko, Mbindia, Lower Fo
		Fomenji, Magha, Fossimondi, Nkingkwa Hills
	African Hill Babbler (<i>Pseudoalcippe abyssinica</i>)	Betchou, Mbindia, Fomenji, Magha , Fossimondi
Vu	Green-breasted Bush-Shrike (<i>Malaconotus gladiator</i>)	Attullah
	White-tailed Mountain Babbler	Quibeko
EN		
VU	Bannerman's Weaver (<i>Ploceus bannermani</i>)	Lechotaw, Mbindia, Betchou, Fomenji, Magha, Fossimondi, Nkingkwa Hills
EN	Banded Wattle-eye	Fomenji, Fossimondi, Magha
EN	Bannerman's Turaco	Fomenji, Magha, Fossimondi
DD	Monterio Bush-shrike	Betchou,
NT	Bangwa Forest Warbler	Betchou, Mbindia, Fomenji, Fossimondi, Magha
NT	White-naped Pigeon	Quibeko,
NT	Grey-headed Greenbul	Betchou, Nkingkwa Hills
	Waller's Starling (<i>Onychognathus walleri</i>)	Fomenji, Fossimondi, Nkingkwa Hills
	Bocage's Akalat (<i>Sheppardis bocagei</i>)	Fomenji

VU: Vulnerable; NT: Near Threatened; EN: Critically Endangered; DD: Data Deficient

The Globally Threatened Birds of Lebialem Highlands

The following globally threatened birds species as listed by IUCN are shown in Table 4 were recorded across the Lebialem Highlands.

Table 4: List of IUCN listed species recorded in the area.

Status	Species	Location
NT	Hartlaub's Duck (<i>Pteronetta hartlaubii</i>).	Mak-Betchou
NT	White-naped Pigeon (<i>Columba albinucha</i>) :	Quibeko
EN, Endemic	Bannerman's Turaco (<i>Tuaraco bannermani</i>)	Fomenji, Fossimondi
NT. Endemic	Cameroon Montane Greenbul (<i>Andropadus montanus</i>)	Fomenji, Mbindia, Quibeko, Lechotaw
NT Endemic	Grey-headed Greenbul (<i>Phyllastrephus poliocephalus</i>)	Attulleh
NT	Crossley's Ground Thrush (<i>Zoothera crossleyi</i>)	Fongenkem Hill (Mbindia)
NT Endemic	Bangwa Forest Warber (<i>Bradypterus (Lopyi) bangwaensis</i>):	Fomenji,
EN, Endemic.	Banded Wattle- eye (<i>Platysteira laticincta</i>)	Fossimondi
VU Endemic	Red-headed Picathartes (<i>Picathartes oreas</i>):	Lower Foto, Besali
VU Endemic	Green, Breasted Bush-shrike (<i>Malaconotus gladiator</i>)	Attullah
VU, Endemic.	Bannerman's Weaver (<i>Ploceus bannermani</i>):	Fossimondi
EN	White-throated Mountain Babbler (<i>Kupeornis gilberti</i>)	Quibiko
NT	White tailed Warbler (<i>Poliolais lopezi</i>)	Attullah
DD	Monterio Bush-shrike	Ngoh

VU: Vulnerable; NT: Near Threatened; EN: Critically Endangered; DD: Data Deficient

The status of some of the IUCN Listed Birds Species Recorded across Lebialem Highlands.

Red-headed Picathartes

Two were seen briefly during the survey, three new nests and eight old nests observed in Lower Foto. The birds were described in Besali but the local guides were unavailable to take the survey team to the sites. Their habitat in lower Foto is greatly threatened from community encroachment and hunting of the birds.

Cameroon Montane Greenbul

This species was observed in small numbers in Fomenji. One of the forests is still very protected but the other site is severely threatened.

Bangwa Forest warbler

Twelve were observed in Fomenji singing. *Bradypterus bangwaensis* was heard twice in Njentse-Essoh-Attah (Ngoh). Their forest habitat was also threatened by local deforestation in Mbindia.

Bannerman's Turaco

A good population was observed in Fomenji/Magha. While a small number was recorded in Fossimondi. Their existence is severely threatened in Fossimondi.

Banded wattle-eye

This species was observed only in Fossimondi. The forest status was highly threatened.

Hartlaub's Duck (*Pteronetta hartlaubii*).

This species was recorded in the Mak-Betchou forest. The forest habitat is relatively less threatened.

White-naped Pigeon (*Columba albinucha*) :

This was only observed in Quibeko. The forest habitat was also severely threatened, though the local chief had reserved a small forest patch.

Grey-headed Greenbul (*Phyllastrephus poliocephalus*)

The threatened Grey-headed Greenbul (*Phyllastrephus poliocephalus*) was seen once during the entire surveys. This lone record in Njentse site during the surveys is an indication of how rare this species could be.

Crossley's Ground Thrush (*Zoothera crossleyi*)

This was observed on the Nyi-Fongokem Hills (Mbindia) in small numbers on the highly degraded hill forest. The neighbouring Nyitebong Hill is still relatively in tact.

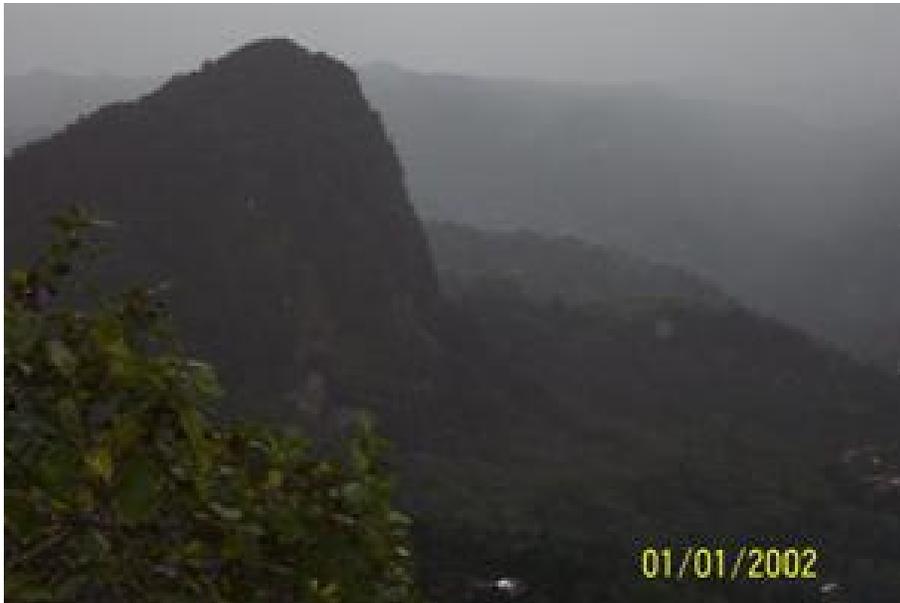


Figure 1: Nyi-Fongokem Hill



Figure 2: Nyitebong Hill Range

Green, Breasted Bush-shrike (*Malaconotus gladiator*)

This was observed in small numbers in Quibeko and Attulleh. As noted earlier, the forest habitats were highly threatened due to farm encroachment

White tailed Warbler (*Poliolais lopezi*)

This species was also observed in small numbers in a threatened forest habitats.

White-throated Mountain Babbler (*Kupeornis gilberti*)

This was observed in the Quibeko area in very small numbers. As earlier observed the forest is no longer intact in spite of the local chief reserving a small area of forest.

Bannerman's Weaver (*Ploceus bannermani*):

This species was observed in Fossimondi and Fomenji. The forest in Fomenji is still relatively intact while that in Fossimondi is already threatened.

Monterio Bush shrike

The Monterio's Bush-shrike was seen twice very briefly and poorly in Njentse-Essoh-Attah. The forest here is still less threatened.

3.1.2 Mammals

The following species of mammals shown in Table 5 were recorded during this survey. The key species include gorillas recorded in the Bechati-Fossimondi-Besali forest block, chimpanzees in the Bechati-Fossimondi-Besali, Mak-Betchou and Nkingkwa Hills forest blocks, drills and leopards in the two latter blocks. The most interesting and keystone species discovered in the course of this project execution are the gorillas in the Bechati

forest, the leopards in the Nkingkwa Hills forest and the chimpanzees found in three forest blocks.

Table 5: Primates and other mammal species recorded in Bechati-Fossimondi-Besali, Mak-Betchou and Nkingkwa Hills forests, Lebialem Highlands

Scientific name	Common name	Bechati-Fossimondi-Besali	Mak-Betchou	Nkingkwa Hills
<i>Loxodonta africana</i>	elephant	-	I, T	I
<i>Gorilla gorilla deihli</i>	gorilla	N, I, F, T, D, H	I	I
<i>Pan troglodytes vellerosus</i>	Chimpanzee	N, I, F, T	N, I, S,	N, I
<i>Cercopithecus nictitans</i>	Putty-nosed monkey	S, V, I	S, V, I	V, I
<i>C erythrotis</i>	Red-ear monkey	S, V, I	S, V, I	S, V, I
<i>C mona</i>	Mona monkey	V, I	V, I	S, I
<i>C preussi</i>	Preuss's guenon	I	I	I
<i>Cephalophus monticola</i>	Bule duiker	D, T, I	I	I
<i>C dorsalis</i>	Bay duiker	D, T, I	S, D, T, I	I
<i>C silvicultor</i>	Yellow backed duiker	-	I	I
<i>C ogilbyi</i>	Red duiker	S, D, T, I	S, D, T, I	D, T, I
<i>Anomalurups beecrofti</i>	Beecroft's flying squirrel	S, I	I	I
<i>Perodicticus potto</i>	Bosman's potto	I	I	-
<i>Hyemoschus aquaticus</i>	Water chevrotain	-	S, I	I
<i>Antherurus africana</i>	Brush-tailed porcupine	S, D, T, I,	D, T, I	I
<i>Phatagions tricuspis</i>	Tree pangolin	S, I	I	I
<i>Thryonomys swinderanus</i>	Cane rat	D, T, F, I	D, T, I	F, I
<i>Protoxenus stangeri</i>	Giant forest squirrel	S, F, I	S, I	S, I
<i>Procarica sp</i>	Rock hyrax	S, D, T, F, I	-	I, S
<i>Galago alleni</i>	Allen's galago	I	I	I
<i>Syncerus caffer</i>	Buffalo	-	I	-
<i>Genetta</i>	Common genet	S, I	-	-

<i>genetta</i>				
<i>Acinonyx jubatus</i>	Leopard	I	I	S, I
<i>Potamocheirus porcus</i>	Bush pig	D, T, I	D, T, F, I	I

S = seen; V = vocalisation; T = Tracks ; D = Dung piles;
F = Feeding signs I = Information from local hunters, H = Hairs

Alongside the birds' surveys, we were concurrently implementing mammals and plants rapid surveys in the same sites. The most significant finding from the mammals' surveys was the recording of the gorillas in the Bechati-Fossimondi-Besali forest and leopards in the Nkingwa hills. Leopards were once considered extinct in the nearby Banyang-Mbo Wildlife Sanctuary. Leopards are a nationally protected species in Cameroon. This recording will once more enable us to design a concerted action plan for this species which will eventually lead to its re-introduction into the wildlife Sanctuary.

3.1.3. Plants

The following species of plants (Table 6) which were listed as being endangered and red-listed candidates were recorded in Fossimondi forest block. This forest block still seems to be the most biologically rich block across the entire highlands given its gradation from 180m to 2510m above sea level. This is actually the western part of Mount Bamboutous.

Table 6: List of red data plant species recorded in the Fossimondi forest area

Status	Species	Remarks
Vu	<i>Impatiens sakerana</i> (Balsaminaceae).	Red-listed Candidate
NT	<i>Lobelia columnaris</i> (Campanulaceae) (Listed:)	
Vu	<i>Pseudogrostistachys africana</i> var, <i>africana</i> (Euphorbiaceae) (:)	Red-listed Candidate
NT	<i>Oncoba ovalis</i> (Flacourtiaceae)	Red-listed candidate
Vu	<i>Allanblackia gabonensis</i> (Guttiferae)	Red-listed Candidate
Vu	<i>Anthocleista scandens</i> (Loganiaceae)	Red-listed Candidate
NT	<i>Syzygium staudtii</i> (Myrtaceae)	Red-listed Candidate
NT	<i>Aerangis graveireithii</i> (Orchidaieae)	Red-listed Candidate
NT	<i>Ancistrorhynchus serratus</i> (Orchidaceae)	Red-listed Candidate
EN	<i>Bulbophyllum nigricum</i> (Orctridaceae)	Red-listed Candidate
EN	<i>Diaphananthe bueae</i> (Orchidaceae)	Red-listed
Vu	<i>Polystachya bicalcerata</i> (Orchidaceae)	Red-listed Candidate
NT	<i>Pittosporum virdiflorum</i> "manrii" (Pittosporaceae)	Red-listed Candidate
NT	<i>Heterosamara cabrae</i> (Polygelaceae)	Red-listed Candidate
Vu	<i>Schefflera mannii</i> (Araliaceae)	Red-listed Candidate
EN	<i>Chasselia liakornensis</i> (Rubiaceae)	Red-listed Candidate
NT	<i>Prunus africana</i> (Rosaceae)	Red-listed Candidate

Source: List of Red Data species (IUCN, 2003) and Red Data candidates (Cheek et al, in prep., and Harvey et al., in prep.)

3.2 Comparing Results obtained from study sites for Prioritization

Prioritization of sites was based on the number of globally threatened species, the number of afro-montane endemics and restricted range species as well as the presence of other biologically important species (e.g. plants and mammals) and biome restrictedness.

Setting priorities for conservation enables multiple species to be conserved simultaneously but a major constraint for these sites is that, most biodiversity remains unknown. We however endeavoured to prioritize sites based on existing data and on-going surveys for Lebiam highlands region.

Based on these criteria, Fossimondi, Fomenji and Magha constitute the most important sites for biodiversity conservation with the presence of 2 endangered birds' species (Bannerman's Turaco and Banded Wattle-eye), over 70 afro-montane endemics, a number of globally threatened birds' species and the presence of the critically endangered Cross River gorilla and endangered eastern Nigeria/western Cameroon chimpanzee in Fossimondi area. Furthermore, the Fossimondi also has interestingly rich and unique plant taxa following the plant inventories conducted by the team from the Royal Botanic Gardens, Kew. In addition, its extension to form a contiguous forest with the lowland rainforest in Lower Foto, Besali and Bechati, further confers additional rich lowland avifauna population to this site of the Lebiam Highlands. The presence of gorillas and chimpanzees (*P t vellerosus*) in this particular forest habitat has conferred a unique significance to this Fossimondi forest area.

The other key sites are the Mak-Betchou, Quibeko, Lechotaw, Nkingwa Hills and Mbindia (Fongonkem Hills). Attulleh, Lower Foto and Nyitebong Hills range also hold a number of globally threatened birds' species. The Nkingwa Hills forest in addition to lodging 4 globally threatened birds' species is also home to leopards and the endangered chimpanzees (*P t vellerosus*).

The sites surveyed constituted the most important areas for birds and biodiversity conservation across the Lebiam Highlands. Our work is still inexhaustive and hence more surveys are still needed in such areas as Tanu and Banteng to complete the avifauna inventory of these highlands. The highlands hold over 50 afro-montane species, 25 restricted range species, 3 endangered species, 1 data deficient and several near threatened and vulnerable species.

The Red-headed Picathartes was recorded only in the Lower Foto (Mdoumbin) forest on a very rocky outcrop. This species was being hunted. It was also reported to be present in Besali and surrounding areas.

In terms of threats, all the montane forests surveyed in Fomenji/Magha, Fossimondi, Attullah, Mbindia, Nyitebong, Quibeko, Lechotaw, Ngoh and Nkingwa Hills are seriously threatened by agricultural encroachment and habitat destruction.



Figure 3: The degraded Lechotaw forest landscape

The forest of Fomenji/Magha recorded the highest number of afro-montane species, followed by Fossimondi. Mbindia recorded over 35 afro-montane species while the highest number of Guinea-Congo forest biome species was recorded (84 species) in Mak-Betchou forest. All of the restricted-range species recorded are endemic to the Cameroon Mountains and Cameroon-Gabon Endemic Birds Areas.

Attullah holds a high potential for the discovery of both afro-montane species and Sudano-Guinean Savanna biome species based on its strategic location along the Leleng-Foto escarpment and Bamileke Plateau.

Eight (Red-headed Picathartes, Bannerman's weaver, Bannerman's touraco, Green Touraco, Green-beasted bush shrike, Banded wattle-eye, Green parrot, White-throated Mountain Babbler) of the 25 totally protected birds of Cameroon have been recorded during this survey period. This once more indicates the potential richness of the Lebialem Highlands (see Table 10 for highlighted names).

The major thrusts of ERuDeF's birds conservation education programme was placed across the key sites identified namely the Fomenji/Magha, Fossimondi-Lower Foto forest complex, Attullah-Leleng Escarpment, Nyitebong and Nyi Fongonkem Hills, Quibeko, Lechotaw and Nkingwa Hills.

3.3 Community Attitudes towards Birds Conservation

Eighty percent of the households surveyed (n=100), generally did not have any interest in protecting birds and or their ecosystems. This was because they did not understand the conservation importance of these birds. About 5% of the surveyed sample did however say that birds were important culturally. This 5% was represented by the local chiefs and notables who use the feathers of Bannerman's Turaco in the caps. Due to this lack of general understanding of the importance of birds, birds' hunting is very common in the forest of Mak-Betchou and Lower Foto. In this later locality, hunting of Red-headed Picathartes was very common. More than 70 bird traps were recorded during the surveys in the Lechotaw site in Mak-Bechou forest. We were informed by key informants that hunting of patriches was very common. Hunting of birds was also common in the other sites surveyed. This activity was generally being led by the youths (75%) and adults (25%).



Figure 4: A hunted bird of prey found in the house of a community member at Lechotaw

3.4 Community Education and Sensitisation meetings

Fifty five meetings were held in all the villages visited during the project period (see Table 7 below). These meetings brought together 4390 people (adults). The meetings were aimed building community commitment and education of the local people on the raison d'etre of the protection of the montane ecosystem and conservation of montane birds. Villages visited included Fomenji, Magha, Fossimondi, Bechati, Besali, Lower Foto, Mbindia, Nyitebong, Attullah, Quibeko, Lechotaw, Njentse-Essoh-Attah, Ngoh, Njongo, Fonki, etc.



Figure 5: A Conservation education meeting at Attullah.

Table 7: The number of education and sensitization meetings conducted in project communities.

Villages	Number of meetings	Attendance/meeting	Total Attendance
Fomenji	6	120	720
Magha	6	80	480
Fossimondi	6	90	540
Attulleh	4	164	656
Nyitebong	2	80	160
Mbindia	2	56	112
Quibeko	3	45	180
Ngoh (Betchou)	3	60	180
Njongo (Nkingwa Hills area)	2	42	84
Lechotaw	5	90	450
Menji	6	50	300
Bechati	4	100	400
Besali	4	112	448
Lower Foto (Ndoumbin)	2	32	64
Total	55		4390

Forty four and 60 conservation education meetings were respectively held with youths and students through out the whole region. The youths came from the communities mentioned in Table 7 above. Meanwhile the students came from the following schools; Government Bilingual Highschool Fontem, Government Technical College Fontem, Government Secondary School (GSS) Ngoh-Essoh/Attah, GSS Anya-Lewoh, GSS Wabane, GSS Muock, Seat of Wisdom College Fontem and GSS Besali.



Figure 6: ERuDeF team with the GBHS Fontem Environmental Club after a training session

3.5 Networking

We forged through a regional conservation agenda (the western Cameroon Forest Program) by developing a networking forum with the following organizations working in Western Cameroon (South West, and North West Provinces); Watershed Task Group (WTG) based in Bamenda and Wildlife Conservation Society (WCS)/Cross River Gorilla Research Project based in Limbe as well as with the Fauna and Flora International, UK and Earthwatch Institute UK. In March 2004, we organized major a meeting between ERuDeF, WTG, WCS/CRGRP and an independent conservationist (John DeMarco, former Chief Technical Advisor and Programme Manager, BirdLife Internatinal/Bamenda Highlands Forest Project). During this meeting, the Western Cameroon conservation strategy was charted out and subsequently, ERuDeF was asked to develop this new strategy.

3.6 Conservation Education

Two teachers' coordinators' workshops for school Nature Clubs were organized in February and May 2004. During the February workshop, the birds' poster competition was launched involving all the secondary schools across the Lebiale Highlands. This competition involved identifying birds within their localities and drawing them. The prize award for this competition took place in 5 June 2004, the World Environment Day. The first five prizes plus a further five consolatory prizes were given out in total. The second teachers' coordinators workshop in May, was used to introduce the design of the first manual on the study of globally threatened birds of Lebiale Highlands. This manual was to be finalized and earmarked to be introduced into schools of this region in the 2005/2006 school year. The transfer of the teachers concerned slowed down the completion of the final output by the stipulated date.

Visits were made to all the 10 secondary schools targeted for the period and 50 environmental education sessions were organized plus two courses on birds' conservation for teachers of colleges. A total 2000 students were reached during the project period.



Figure 7: A conservation education session in Government Secondary School, M'mouck

The first network of school conservation clubs was initiated in May 2004 involving the following colleges: Government Bilingual High school Fontem, Youth Technical and Commercial College Fontem, Government Technical College Menji, Seat of Wisdom College Fontem, Government Secondary School (GSS) Azi, GSS Ngoh, GSS Anya, GSS Mmouck, GSS Besali and GSS Wabane.

3.7 Training

Three training workshops were organized for youths, students and community leaders in the months of February, May and September 2004. The 2 training workshops in February and May were aimed at training youths and creating awareness amongst them on the importance of conservation of montane birds and the techniques of managing the Lebialem Highlands ecosystem.

Two training workshops were organized for teachers' coordinators of schools' environmental clubs in February and May 2004. The aim of these workshops was to train teachers' clubs coordinators on the planning and management of birds' conservation education programmes. It was also aimed at training them on the production and use of birds' educational manuals.

While the September training course included laureates of the students contest, leaders of forest management committees, other community leaders selected by the respective communities, and selected youths. This course was focused on birds' education, ecology, survey techniques, monitoring and conservation of montane birds. Each of the courses lasted for 10 days.



Figure 8: Jaap and Rogers (Trainers) with some of birds course participants



Figure 9: Roger training community leaders in birds' identification techniques. One of the students (girl) laureate standing extreme left.

The staff of the Ministry of Environment and Forestry (MINEF) also participated in all the training workshops and surveys organized by ERuDeF. In this way, we further built their operational capacities and efficiency.

The major outputs of these trainings included i) enhanced capacity of youths and community leaders to identify and monitor the birds of the region ii) a number of resolutions were adopted aimed at strengthening law enforcement and birds' conservation in the region iii) as a result of the training, one bird watcher, Mrs Jean Skeen offered a pair of binoculars to one of the community leaders from Fomenji, while Roger Skeen offered another pair to ERuDeF for its birds' conservation programme. iv) the workshops conducted in Attulleh and Fossimondi led to the designation of forests for birds conservation by the respective communities.

3.8 Students Contests

A contest was launched in February to enable students in the various secondary schools across the Highlands to sketch birds of relevance in ecosystems nearest them. This was a 4-month contest that was concluded in June 5, 2004 with the award of prizes to the five best students. Eighty five students entered the contest. A total of 203 different birds were sketched. A jury was set up in May to select the first five best students. Prizes worth 70 GBP were awarded to these students. One of the laureates was a young girl. The prize award ceremony was presided over by the Senior Divisional Officer for Lebiale Division and assisted by the Divisional Delegate of Environment and Forestry. These five students were further retained to be part of a 10-day training workshop on birds' education, ecology and conservation that was organized in September 2004.



Figure 10: Samples of birds drawn by students in 2004 during the students' contest

3.9 Students' Calendar

Some of the birds resulting from the students' contest were then used to develop the students' birds' calendar for use both in the schools and communities. These results were also used to develop a small manual for the teaching of endangered birds in schools across Lebialem Highlands.



Figure 11: A sample of students' calendar

3.10 Development of conservation education materials (Manuals of endangered birds and all Lebialem Birds, Posters of montane birds & Calendars)

The birds' poster and manual developed were later being used for the teaching of conservation education in schools in the region. Furthermore, the then BirdLife International/Bamenda Highlands Forest Project also provided some posters for the teaching of conservation education and use during public events.



Figure 12: Students using posters during public events

3.11 Capacity and Institutional Building

During the period under review, three staff went on training. Terence Atem respectively attended a 2-week course on plants identification in April organized by Earthwatch Institute Cameroon Team III and an 8-day course on plants systematics, surveys and data management organized by the Smithsonian Institution/MAB Programme in July. David Lekeaka attended a 2-week course on biodiversity assessment in the Taita Hills, Kenya in May organized by the Earthwatch Institute. Mrs Nkempi attended a 2-week course on gender and communication organized by Pan African Institute for West Africa in June and funded by the Cameroon's Canadian High Commission Gender and Development Fund.

The local community groups were trained on group dynamics, institutional and legal aspects of group management. Two training courses respectively on prunus farming and wildlife domestication were organized for the local groups in March and June. There after, seed grants of £ 150 each were given to five local groups to assist them start up their activities. We have also assisted three other groups to be registered legally.



Figure 13: Training women in wildlife domestication: case of porcupine domestication

Six new school conservation clubs were created in Government secondary schools (GSS) Ngoh, Mmouck, Wabane, Besali, Seat of Wisdom and Lewoh. Through respective environmental education sessions and workshops, the capacity of these clubs was strengthened.

Five additional forest management committees were created in Fomenji, Magha, Bechati, Besali and Bamumbu villages on the western side of Mount Bamboutous.

The Lebialem Eco-tourism Association was formed on June 5th during a workshop organized to finalise the groundwork for the formation of this association. The Association is dedicated to improving nature conservation through nature tourism across Lebialem Highlands. The first major activity of this Association, was the documentation

of the major touristic sites and formation of village-based nature tourism committees across the highland area.

During the birds training course organized in September 2004, the Lebialem Birds Conservation Association was also formed. This was comprised entirely of community representatives and students. ERuDeF was nominated as the advisor.

3.12 Organisation and Participation in Public events

These events included 5 radio programmes, 2 Youth and National Days during which students marched with environmental posters. We organized events during the World Tree Day in April and the World Environment Day in June. These activities were aimed at improving local knowledge on birds and biodiversity and encouraging positive attitudes towards birds' conservation with the objective of building a public constituency.



Figure 14: Students of the Environment Club of GBGS Fontem participating in public manifestations (National Youth Day of 11 February 2004)

Finally, a symposium was organized on 5 June 2004 on the theme “Birds and Sustainable Development”. This was aimed at demonstrating how birds contribute to the improved wellbeing of the human kind. Some key community leaders, project staff and local administration were the participants.

4.0 Project Impact

The following are the most important impacts of the project.

- Six additional school conservation clubs were formed. Furthermore, a network of school conservation clubs was formed.
- The Lebialem Birds' Conservation Association was created to serve as an advocacy group. This is a community-based association being led and managed by

community leaders and youths. The Lebialem Eco-tourism Association was also formed to promote nature-based eco-tourism.

- Permanent sites have been designated for birds' conservation across Lebialem Highlands. Furthermore, community leaders approved the plan for the reforestation of the degraded landscape. In this respect, they formed the Lebialem Prunus and Economic Trees Farmers Common Initiative Group.

- The project led to the discovery of a new sub-population of gorillas and chimpanzees.

- The project has increased the biological understanding of the birds of the region, their threats and determination of the most appropriate conservation actions in key specific sites

- Furthermore, the project has shown that the Lebialem Highlands is one of the priority conservation sites on the Cameroon Mountain chain. The study of the other taxa will certainly increase the biological importance of this site.

- There was substantial increased in community awareness of the factors limiting and constraining successful birds' conservation and there was a concerted need to eliminate these factors. This is shown by their determination to stamp out threats. This led them to lobbying the Senior Divisional Officer for Lebialem to issue an order banning birds hunting and destruction of their habitats in the Division after their training course in September 2004.

- There was increased networking between ERuDeF and the other conservation organisations in the region namely the Watershed Task Group, Western Highlands Nature Conservation Network, Wildlife Conservation Society and recently the Fauna and Flora International. This led to the initiation of the Western Cameroon Forest Programme that will cover the South West and North West Provinces of Cameroon.

- This project finally led to the development of a new partnership with Bees Abroad, a UK charity. Bees Abroad is helping us to develop a pilot beekeeping project around the Bechati-Fossimondi-Besali forest.



Figure 15: Brian Durk of Bees Abroad, UK and Nelly of ERuDeF inspecting a beehive in Bechati.

Conservation Management Actions Initiated

The key actions identified at the time and initiated included;

- i. Key sites identification.
The major sites for montane birds' conservation were identified. These sites are now the major focus of birds' conservation activities across the highlands.
- ii. Community-based forest management institutions have been created at some of the sites notably Fomenji, Magha and Fossimondi to continue advocating for the protection and conservation of key sites in the area. These institutions will be created in all the key sites.
- iii. Lebialem Birds Conservation Association. This was formed after the birds training course. It was put into place to advocate for the conservation of the endangered birds and protection of key birds habitats in Lebialem Highlands. The community leader from Fomenji (Mr Nembo Thomas) was elected as the pioneer President.
- iv. The Lebialem Eco-tourism Association was also formed to promote birds' conservation through nature tourism. The key birds' sites correspond to major eco-tourism attractions across the Highlands.
- v. The creation of community forests in the key birds' sites was envisaged as the longer term measure of protecting these sites from community encroachment.

5.0 The Future Management of the Lebialem Highlands

5.1 Landscape Approach

The management of the Lebialem Highlands' landscape is being designed to be accomplished in synergy with the other surrounding protected areas which are serving as refugia for biological populations. These protected areas include the Santchou Game Reserve, the Banyang Mbo Wildlife Sanctuary and Mwane Forest Reserve. Within the Lebialem Highlands landscape itself, the following conservation units are being proposed namely two Wildlife Reserves, a Forest Reserve, an Ecological Reserve and a number of community forests. These will have to be managed in tandem with the surrounding protected areas. The results presented here demonstrate the biological richness of the Lebialem highlands range. Only two third of the area was covered by this study. The studies show the need to urgently put in place more conservation related measures to enhance the conservation of the biological resources. The highlands hold an extremely rich and diverse avifauna, several endemic species of plants, amphibians and reptiles. The Highlands constitute a very highly fragile ecology and McNelly (1990) describes such areas as ecologically sensitive areas (ESAs) that need special protection. This is the special reason why an ecological restoration programme is being proposed for parts of these highlands.

The management of this area presents a number of opportunities namely

- i) The existence of neighbouring protected areas. The Takamanda Forest Complex to the North West, Banyang-Mbo Wildlife Sanctuary to the South East, WIJMA Forest Exploitation Concession No. UFA00012 to the South and the devastated Bamboutous

Forest Reserve to the North. These protected areas serve as refuge sites for biologically important populations which could be used as sites for future restoration efforts.

ii) Committed local and national leadership. Community leaders and local representatives are totally convinced on the necessity of designing appropriate management and conservation interventions across the highlands range as demonstrated during the October 2003 workshop. The hierarchy of the Ministry of Environment and Forestry has equally shown appropriate commitment toward supporting the conservation actions being designed. Presently, there is a high collaborative effort between the Ministries of Territorial administration and Decentralisation (MINATD) and Environment and Forestry on the development of joint interventions to mitigate the effects of the serious landslides that occurred in one of the Highlands' very fragile area (Wabane) and that led to the death of 21 people in July 2003. This high level government commitment is in tandem with ERuDeF's efforts to design appropriate and broad-based community natural resources management approaches.

iii) The presence of great apes. The presence of chimpanzees and gorillas in some of the key forest sites is providing additional support from both national and international partners.

5.2 Technical Operational Unit (TOU) approach

Within the framework of the Ministry of Environment and Forestry, ERuDeF is proposing the creation of a technical operational unit as the most appropriate legal framework for the management of this area. The TOU will comprise of the number of conservation units cited above. ERuDeF and the Provincial Delegation of Environment and Forestry for the South West had begun discussions on the procedure of establishing this TOU.

5.3 Lebialem Highlands as a Potential Important Bird Area (IBA)

Considering Lebialem Highlands in terms of birds conservation in the SW Province, available data (Table 8, below) shows that Lebialem Highlands have the second highest number of birds' species (355), coming after the Mt Cameroon region. Similarly, the Lebialem Highlands and Bakossi Mt have the same number of IUCN listed birds' species. The unique presence of two endemic birds' areas (Cameroon Mountains and Cameroon-Gabon) and with the presence of many range extensions confer this characteristic richness on Lebialem Highlands.

Site	Species richness	IUCN listed species	Biome A05	Biome A07	Restricted range species
Lebialem Highlands	355	14	100	52	26
Bakossi Mountains	334	14	158	40	21
Mount Cameroon	375	13	147	42	23
Mt Muanenguba	270	11	-	43	18
Mbulu Forest	228	8	79	28	18
Mount Kupe	320	-	-	37	16
Takamanda Forest Reserve	309	9	139	28	16
Rumpi Hills	213	9	96	28	14
UFA 11-002	174	4	88	11	5

Table 8: Regional importance of Lebialem Highlands for birds' conservation in SW Cameroon

Considering the following Important Birds Area (IBA) classification criteria;

Category A1: Globally threatened IUCN listed species: Endangered (EN), Vulnerable (Vu), Near threatened (NT), and Critically endangered (CR)

Category A2: Range-restrictedness

Category A3: Biome restrictedness: Biome A03 (Sahel), Biome A04 (Sudan and Guinea Savanna), Biome A05 (Guineo-Congo forest), and Biome A07 (Afro-tropical highlands).

Category A4: Large concentration of birds' species

From the above criteria, the Lebialem Highlands qualifies for category A1 with already 14 IUCN listed species, category A2 with over 20 range restricted species, category A3 with a large number of afro-montane species and endemics and category A4 with over 355 species of birds in the region falling in two endemic birds' areas namely the Cameroon Mountains and Cameroon-Gabon Endemic Birds' Areas. With the complete survey of the whole Lebialem region, it is evident that more species will be recorded thus increasing the potential competitiveness of these highlands over the other highlands areas on the Cameroon Mountain chain. From the foregoing, ERuDeF is recommending this area to be classified as an important bird area (IBA).

5.4 Challenges for Conservation

However, our work in this area presents a number of challenges namely;

i) Reconsolidation of the fragmented forest landscape. This will be done through active ecological restoration. The fragmented forests need to be consolidated through rehabilitation and regeneration through the use of indigenous trees.

ii) Legal status. Currently these highlands have no legal status. ERuDeF work is meant to document baseline information that will enable us to prepare appropriate legal documents and management interventions to be submitted to the Government of Cameroon for recognition. The highland area is therefore a potential candidate for a protected area considering its ecological fragility, presence of gorillas and chimpanzees and richness in birds' populations. Creating a TOU across the range constitute the current proposal being debated with the staff of the Ministry of Environment and Forestry.

iii) Landscape destruction. The highly ecological fragile nature of the highlands coupled to the high human pressure is putting a lot of weight on the carrying capacity of this environment. The negative impact of this is the constant and regular occurrences of landslides across the entire highland landscape. These landslides usually led to the destruction of biodiversity, forests, landscapes, the local economy and property. In July of 2003, a series of major landslides occurred across the Highlands that led to the killing of 21 people, destruction of property worth over US \$ 1 million and eroding away of a major biodiversity critical habitat. Landslides are one of the major contributing factors to the fast fragmentation of the highlands landscape. Appropriate and urgent management interventions are now needed to halt and reverse these negative trends. The current collaborative effort between MINATD and MINEF is in this direction.

6.0 Conclusions and Way Forward

6.1 Conclusions

The birds' surveys conducted from January 2004 to February 2005 revealed the conservation importance of Lebialem Highlands as an important site for birds' conservation. So far, over 355 bird species were recorded across Lebialem Highlands.

This work was the first ever research and conservation action in this part of Cameroon since the last three decades. The characteristic presence of the three biomes namely the Guino-Congolian, Afro-montane and Sudano-Sahel biomes justifies why this site should be classified as an important bird area (IBA) following the BirdLife International classification. Furthermore, the presence of endemics, globally threatened and rare birds species adds credence to the naming of this site as an IBA. The discovery of new sites for great apes especially the Cross River gorilla (*Gorilla gorilla dielhi*), makes this site a very important biodiversity rich area. This discovery further extends the range of this ape further than what was originally thought to be found only in the Takamanda forest complex. The concentration of rare and endemic plants species (with 26 species already

identified as candidates on the Red Data list) at the Fossimondi site alone, equally makes this area a critical site for conservation on the western Bamboutous Mountain.

Important remnants of montane and submontane vegetations are threatened by anthropogenic forces like bush fires, over grazing (e.g. in Fossimondi and Fomenjimagha), agricultural encroachment and habitat destruction e.g. through landslides and over-hunting in some sites.

The willingness of the local communities to contribute to the process and be actively involved in conservation activities and their own development, gives a lot of hope in the long term sustainability of this project and the conservation actions being designed. This work is raising high expectations among the entire local stakeholders and their enthusiastic support is being considered as essential to the success of this programme. Further Rufford Foundation support will enable us expand and concretize on these preliminary achievements.

ERuDeF conservation efforts will be refocused towards the following primary areas namely a) forest landscape restoration b) creation of community forests in each of the key sites for birds conservation c) creation of a conservation centre for the management of mountain ecosystems d) landscape management through nature tourism e) strengthening the technical and organizational capacity of community-based forest management institutions f) cross-cutting education and sustainable livelihood programme and g) development of birds bio-monitoring programme

6.2 Recommendations

More surveys should be carried out for birds and other taxa in the remaining areas of Lebialem highlands region not covered by this survey.

Due to the presence of many endemic / restricted-range species in these highlands we are suggesting the creation of an Important Bird Area (IBA) in these highlands.

The development of strong and viable community-based forest management institutions is a must step in forging ahead a viable community-based forest conservation programme. Forest management committees must be viable and equipped with the necessary capacity (both institutional and technical) to sustainably manage “their” forests. Participatory forest management remains the most comprehensive approach for forest and other natural resource management in the region to survive.

6.3 Way Forward

The creation of the Lebialem forest landscape restoration programme modeled on the ITTO/IUCN approach is the most appropriate and recommended way to restore the productivity of the Lebialem Highlands landscape. Discussions with ecologists, restoration ecologists, development specialists and conservationists all tend to show that

only a more concerted effort will lead to the restoration of the productive functions of this landscape.

This programme will have the following major components: forest birds conservation and bio-monitoring, highlands forest restoration (of fragmented and degraded habitats), great apes conservation, sustainable livelihoods, training and capacity building, development of a technical operational unit (consists of a series of legally gazetted forest areas) and creation of a conservation/education center for the training and education of the diverse local stakeholders.

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8.0 Some touristic sites



Figure 16: Government school Magha in front of Mt Magha



Figure 17: Fomenji touristic but degraded montane landscape. One of the most important refuge of montane birds in western Cameroon.

Annex 1: Totally protected birds of Cameroon

No	Scientific Names	English Names	Habitat (Areas Found)
1	Picathartes Oreas	Red-headed Picathartes	Forest
2	<i>Ciconia Nigra</i>	Black stork	Swampi region
3	<i>Sagittarius Serpentarius</i>	Secretary birds	Mountains
4	Platysteria laticincta	Banded wattle-eye	Mountain
5	Poicephalus Crassus	Green parrot	Savana / Forest
6	<i>Balaeniceps rex</i>	Shoe bill	Swampi region
7	<i>Ibis Ibis</i>	Yellow billed start	River banks
8	Touraco bannermani	Bannerman's touraco	Mountain forest
9	<i>Francolinus Camerunensis</i>	Mount Cameroon Trancolin	Mountain forest
10	<i>Struthio Camelus</i>	Ostrich	Desert/Savana
11	<i>Poicephalus guliedmi</i>	Brown-necked Parrot	Forest/Mot Region
12	Touraco Persea	Green Touraco	Forest
13	<i>Kupeomis gilberti</i>	While-throated Mountain Babbler	Mt. Forest
14	<i>Ephippiorhynchus Senegalensis</i>	Saddle-billed start	Swampi region
15	<i>Poicephalus senegalus</i>	Senegal parrot	Savana
16	<i>Psittacula Kramerii</i>	Rose-ringed parakeet	Arid region
17	<i>Poicephalus meyeri</i>	Meyer's parrot	Mt. Forest
18	Malaconotus Gladrator	Green-beasted bush shrike	Sub Forest Mt
19	<i>Malaconotus Kupeensis</i>	Mt Kupe Bush shrike	Mt forest
20	<i>Terathopius ecanndatus</i>	Bateleur	Savana
21	<i>Agapornis pullarzius</i>	Red-headed lovebird	Savana/forest
22	<i>Baleazeca Pavonina</i>	Black Growned crane	Sleep/plains land
23	<i>Pheonicopterus rubber zoseus</i>	Greater flamingo	Swampi region
24	Ploceus bannermani	Bannerman's weaver	Mt. Forest
25	<i>Ciconia ciconia</i>	While storf	Dry humid aeas.

Birds' species in bold are those found in Lebialem Highlands