

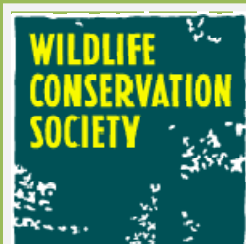
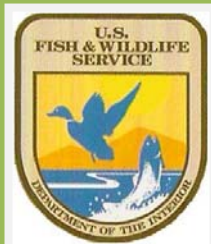
# **Annual Report of Cross River Gorilla Ecological Monitoring at the Kagwene Gorilla Sanctuary, Cameroon**

**Progress Report for July 2011 – June 2012**



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## **Executive Summary**

Data analyzed and presented in this report were collected from July 2011 to June 2012 using the Cybertracker. During this reporting period WCS staff concentrated on gorilla ecological monitoring while the MINFOF staff carried out anti-poaching patrols. A total distance of 714.6 km was covered in 258 gorilla trail days and 676.4 observation hours. Data were recorded at 226 fresh night nest sites, comprising 1,488 individual nests of Cross River gorilla. An infant gorilla foot print and an infant gorilla nest were recorded in the minor and major groups confirming the presence of infants in both groups. Gorillas were found to range mostly in the northwest and centre of the Sanctuary, their typical home range in recent previous years. Analysis of fresh and recent feeding evidence on trails produced 2,639 records of feeding events. The most commonly eaten plant parts were pith (66.3%), leaves (16.9%), and fruits (11.2%). These plant parts eaten by the gorillas indicated a peak for fruits in January to February and leaves in May. MINFOF Eco-guards carried out 93 days of anti-poaching patrols from July 2011 to June 2012 covering more than 320.3km and more than 265.5 hours of observation within the Kagwene Gorilla Sanctuary. This gives a mean of 32.03 km each month. Assessment of patrol coverage using the grid-based overview system indicated that 87 of 94 grid cells (92.55%) in KGS were patrolled by the Eco-guards. The Conservator also made much effort to enforce the wildlife laws within the KGS during this reporting period.

The second annual wildlife survey in the KGS using the guided recce method with survey lines generated systematically on a topographical map of the Sanctuary was completed during the reporting period. The results indicated that most wildlife species within the sanctuary were gradually increasing as compared to the first survey.

The spatial distribution of the large mammals indicated an overall higher concentration in the northwest section of the sanctuary which had least human activities compared to the south, southwest and southeast sections. This coincided with the preferred gorillas range. Farming under the forest canopy and grazing of livestock in the grassland areas of the sanctuary are issues currently being addressed in the process of developing a management strategy for the sanctuary.

The initial camera trapping activities established during this reporting period have proven extremely successful and encouraging, revealing some of the best images of Cross River gorillas to date. These images have not only indicated important information about the gorilla population, but have also led to increased international publicity and awareness about the rarity of the Cross River gorilla.

Apart from ecological monitoring and anti-poaching carried out during this reporting period, we also continued the community livelihood activities of the beekeeping programme initiated in 2009.

## **INTRODUCTION**

Field research began in the Kagwene Mountains in 2003. At this time work was primarily focused on understanding the behavioural ecology of the gorillas and the recording of human activities. Between 2004 and 2005 an intensive gorilla monitoring period was organized and considerable data were collected related to home, seasonal, and daily ranges, in addition to nesting and feeding behavior. From early 2006 a greater emphasis was also placed on patrolling and removing snares. Beginning in 2009, the appointment of two MINFOF Eco-guards to the sanctuary permitted a greater focus on anti-poaching and enforcement actions to be implemented to compliment WCS's continued daily gorilla monitoring.

This report presents the results of monitoring and protection activities within the Kagwene Gorilla Sanctuary (KGS) from July 2011 to June 2012. In order to evaluate the effectiveness of WCS intervention measures within the sanctuary three monitoring measures were carried out: 1) Tracking to Cross River gorilla nest sites – to monitor the use of the sanctuary by the gorillas and assess social and ecological parameters of the gorillas; 2) Anti-poaching (MINFOF) patrols – to monitor human pressure and reduce its impact, and 3) Wildlife survey – to give an estimate of large mammal populations and human activities within the sanctuary. Data were also collected on “Other type of work” – to collect more information on wildlife species within the sanctuary after ending gorilla tracking at a fresh nest site. During each of these monitoring activities data were collected according to an adaptation of the recce walk technique (Kühl et al. 2008; White & Edwards 2000). The full methods are described in the “Proposed Kagwene Gorilla Sanctuary Monitoring Protocol Manual updated February 2010 version”.

The aim of the monitoring program is to assess whether WCS activities within the KGS are improving the conservation prospects for all wildlife species and the understanding related to the behavioural ecology of the Cross River gorilla (CRG) (though this is not an empirical focus). The objectives are:

- To monitor the presence, distribution, and ecology of the CRG;
- To monitor the presence, distribution and pressure of human activities within the KGS; and
- To monitor the presence and distribution of other wildlife within the KGS.

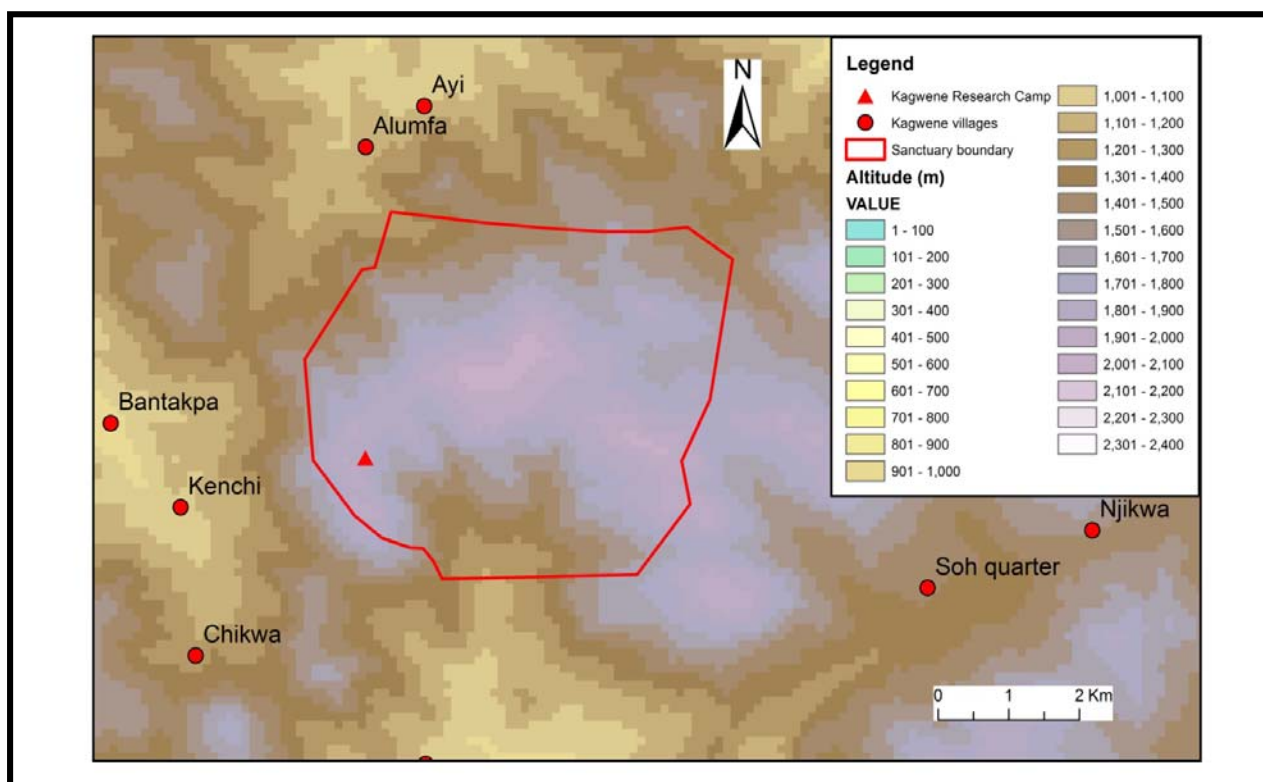
This document presents the analyses of these results along with detailed information of management related factors.

## Sanctuary Background

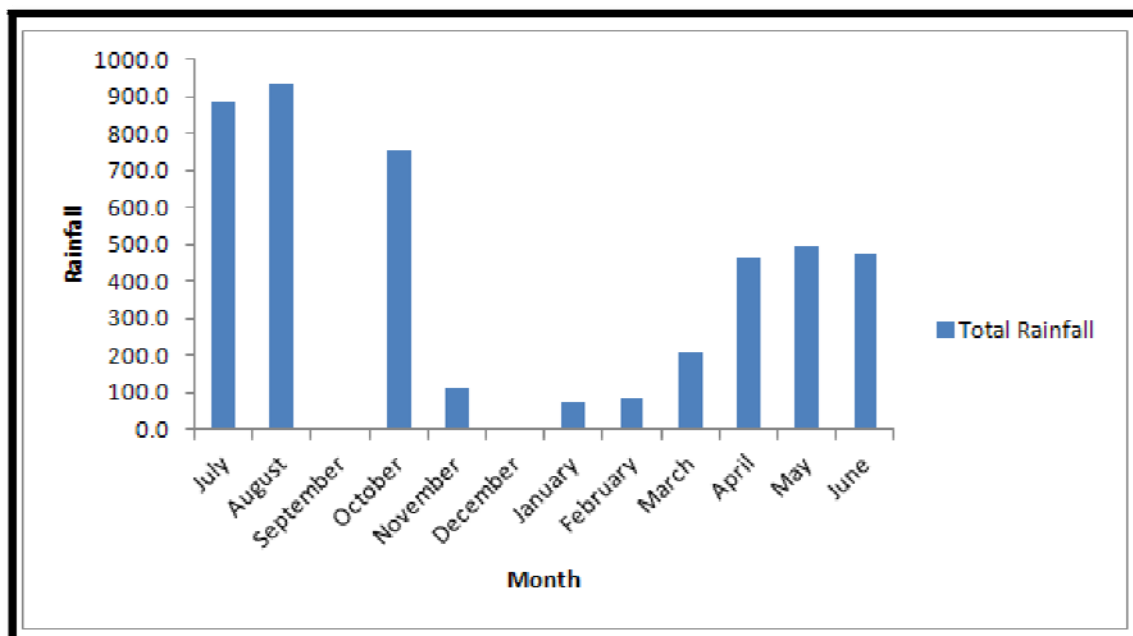
The Kagwene Gorilla Sanctuary was created on 3<sup>rd</sup> April 2008. It covers a 19.4 km<sup>2</sup> area consisting mainly of montane forest and grassland (Figure 1). Altitude ranges from 1,000 - 2,037 m.a.s.l.

We recorded rainfall (mm) and temperature (<sup>0</sup>C) at 0730h everyday at the Kagwene research camp using a rain gauge situated in open grassland to measure rainfall and a min-max thermometer positioned in a shady part of the camp to record the lowest and highest temperatures (Figure 2 & Figure 4).

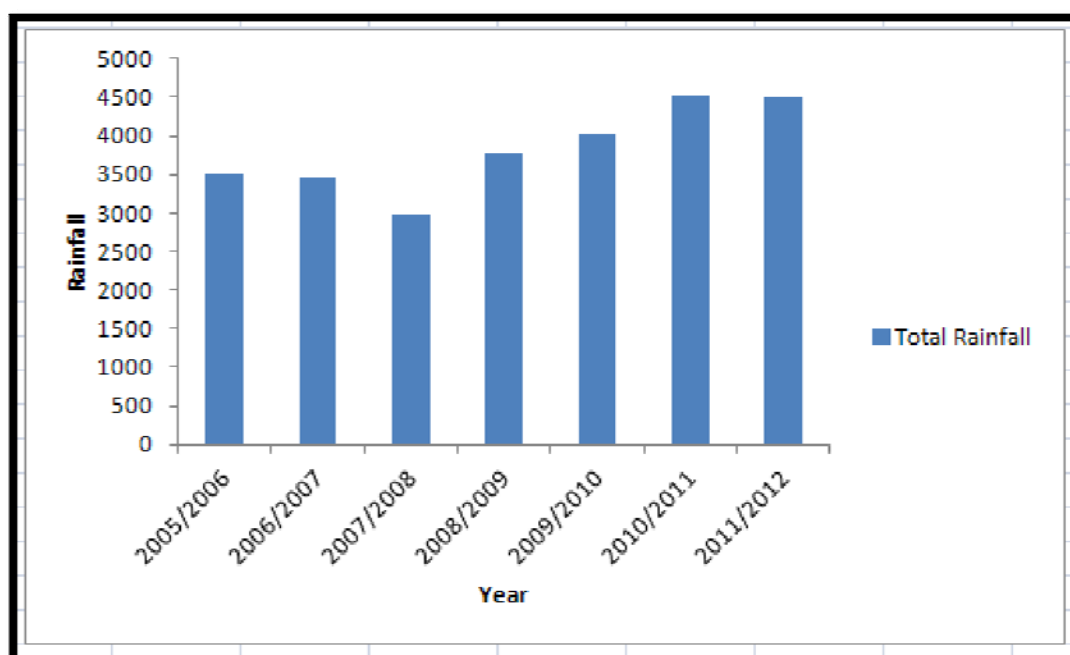
The climate is characterized by a short dry season (November to March) and a long wet season (April to October) each year. There was more rainfall in Kagwene Gorilla Sanctuary during the reporting period compared to the past five years respectively (Figure 3). Due to a faulty thermometer data on temperature was not collected in September and October 2011, similarly rainfall data was not able to be collected in September 2011.



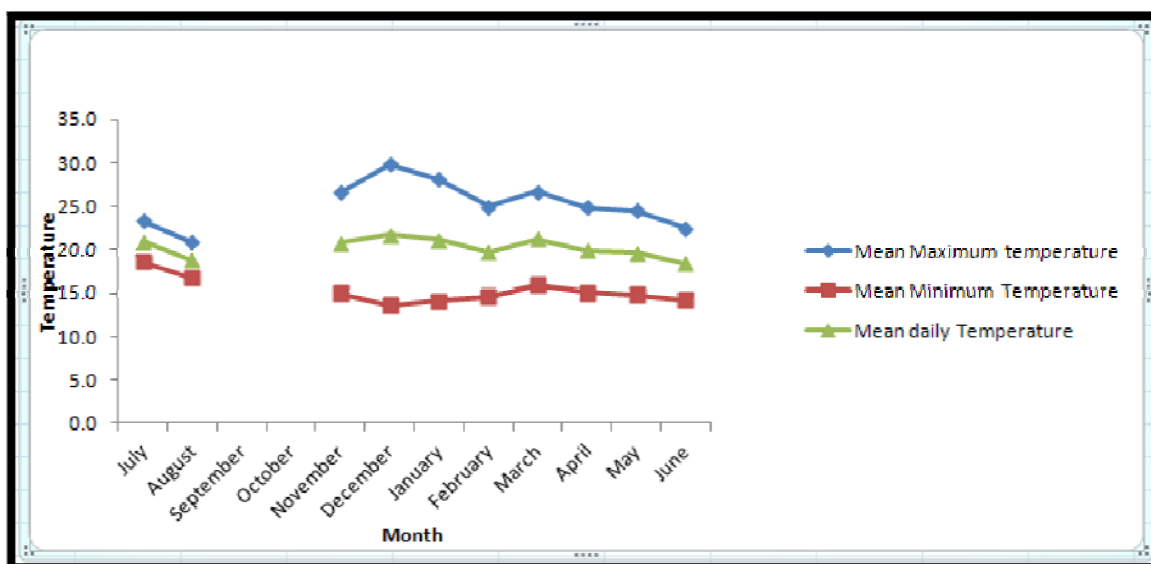
**Figure 1:** Topography of the Kagwene Gorilla Sanctuary June 2012.



**Figure 2:** Rainfall in the Kagwene Gorilla Sanctuary, July 2011 to June 2012.



**Figure 3:** Annual rainfall in Kagwene Gorilla Sanctuary from July 2005 to June 2012.



**Figure 4:** Temperature records taken at the Kagwene Research Camp from July 2011 to June 2012. (Data was not collected in September and October due to the malfunctioning of the thermometer.)

## CROSS RIVER GORILLA MONITORING

### METHODS

#### *Study site*

Gorilla trails were located each morning either from observations of a fresh trail seen the previous day, from reports made by the MINFOF anti-poaching team, or by making use of the extensive local knowledge of WCS trackers. Between July 2011 and June 2012, tracking to Cross River gorilla nest sites was alternated between the two known Cross River gorilla groups (Major group and Minor group) present in the Sanctuary.

#### *Study groups*

A brief history of the social organisation of the Cross River gorilla group in the KGS prior to the reporting period (July 2010 to June 2011) is presented here to facilitate the reader's understanding of the current situation. At the end of 2005, a mean group size of 12.4 gorillas was reported within the Kagwene Gorilla Sanctuary [Sunderland-Groves, 2009 #159]. In July 2006, trail observations indicated evidence that an aggressive incident (probably a dominance contest) occurred after which we began to observe two nesting groups; one group of six and another group of eight individuals suggesting a split in the previous single group. It was suspected that the older silverback from the one large group was ousted in July 2006 and two younger silverbacks each began to range separately with following females. In March 2007 a villager from Ayi reported the sighting of a lone silverback near his 'farm' (supposed within the boundary of the proposed Sanctuary). In subsequent years we continued to receive reports from villagers in Ayi about the sighting of a lone gorilla nest (occasionally two) in their forest area closed to the Sanctuary. In May 2008 the first signs of further group fission were observed when following the Major group trails. In May 2010, we conducted a survey in the reported area to investigate these observations and recorded several old different single nest sites, confirming the presence of the suspected ousted silver back. Currently there are two

groups ranging within the Kagwene Gorilla Sanctuary (the Major and Minor groups). During this reporting period group fission and a lone gorilla nest were encountered and these results are presented below.

### **Data collection**

#### *Gorilla Monitoring*

Data were collected only from trails less than three days old. Rugged, hand-held computers equipped with CyberTracker software were used for data collection following the KGS monitoring Protocol of 2007 updated in April 2009 (Warren et al 2009). Data were collected for large mammal signs, gorilla feeding, and nest sites less than three days old. In particular, a keen look-out for evidence of infant and/or juvenile gorillas (small gorilla footprints, small dung in nests, or small nests) was maintained.

#### *Annual Wildlife Survey*

An annual wildlife survey was conducted using the guided recce method. The guided recce lines were placed systematically over the topographical map of Kagwene Gorilla Sanctuary (Figure 17). Two wildlife surveys were carried out during this reporting period (one in the dry season and another in the wet season).

#### *Anti-poaching Patrols*

The entire sanctuary was patrolled with particular focus on specific areas in some months where certain human activities were known to be occurring. The MINFOF Eco-guards started monthly anti-poaching patrol activities in the sanctuary only from March 2012 and continued to the end of this reporting period. Patrols made use of the main forest paths in the sanctuary and branching to follow hunting trails when observed. The patrol team avoided opening up new trails.

### **Return from Cross River gorilla nest (RCRG) “Other” type of work**

Apart from tracking gorillas and collecting data on gorilla feeding evidence and other gorilla activities on an identified trail to a nest site to collect nest site data, the monitoring team collected data on the signs of other wildlife species and human activities. This was continued once the nest site was arrived at and the monitoring team was taking the shortest possible track back to the camp. We called this as “Return from Cross River gorilla” (RCRG) or simply “Other” type of work. This supplemented data collected during regular wildlife surveys and anti-poaching patrols.

#### *Human Data collection*

Fresh and recent human sign, as well as all large mammal sign was noted during patrols. If snares were encountered they were recorded and then removed. Data were collected using a CyberTracker equipped hand held computer.

#### *Climate*

From July 2011 to June 2012 KGS had a long wet season (April to October) and a short dry season (November to March), with a total of 4494.8 mm of rainfall. Rainfall data was not recorded in September 2011 due to some misunderstanding by the KGS camp staff. Rainfall was recorded in all months except September and December 2011. However, heavy rains were recorded in between July 2011 and October 2012 with a peak in August 2011. The months of December, January, and February had little or no rain. Mean monthly temperatures ranged between 18.4°C and 21.8°C, with the greatest daily fluctuation in temperature recorded in November and December.

## Results and discussion

### 1. Gorilla Monitoring

Two hundred and fifty eight days of gorilla trail monitoring took place. The analysis showed that a total of 714.6 km of gorilla trails were walked, with an average of 59.55 km each month (range 14 – 147.7 km) and more than 676.4 hours of observation were made (Table 1). The majority of gorilla ranging was in the northwest and centre of the sanctuary, but on the following days, 10<sup>th</sup> of October 2011, 17<sup>th</sup> and 19<sup>th</sup> of May 2012, whilst tracking the Major group the trail was observed to range outside the boundary of the sanctuary (Figure 5) where the gorillas nested. Detailed feeding data showed that on these occasions they fed on pith of *Aframomum* sp, *Anchomanes difformis*, *Nephtytis poissoni*, *Palisota manii*, *Landolphia congolensis* and on black ants. However in the previous reporting years gorillas have been nesting in this same area where they fed on particular fruits near the village of Alumfa (Ikfuinge R, 2011).

**Table 1:** Parameters of tracking Cross River gorilla trails in Kagwene Gorilla Sanctuary, July 2011 to June 2012.

Month	Gorilla tracking			Other			Combined effort	
	# of days	# of hours	Distance (Km)	# of days	# of hours	Distance (Km)	# of hours	Distance (Km)
July	23	61.2	63.1	21	56.7	60.0	117.9	123.1
August	24	61.4	76.4	20	60.1	73.8	121.5	150.2
September	20	34.6	38.6	8	19.1	22.9	53.7	61.5
October	25	25.3	29.9	19	22.7	27.1	48	57
November	12	17.7	14	12	14.1	21	31.8	35
December	14	22.3	21.2	19	44.7	42.2	67	63.4
January	26	46.2	36	21	33.6	39.3	79.8	75.3
February	26	133.9	147.7	19	60	71.3	193.9	219.0
March	27	107.1	82.4	19	72.5	63.1	179.6	145.5
April	20	56.5	69.6	14	37.3	46.2	93.8	115.8
May	17	51.8	56	13	36.9	38.2	88.7	94.2
June	24	58.4	79.7	14	37.5	51.5	95.9	131.2
<b>Totals</b>	<b>258</b>	<b>676.4</b>	<b>714.6</b>	<b>199</b>	<b>495.6</b>	<b>556.6</b>	<b>1171.6</b>	<b>1271.2</b>

Data were collected on “Other” work type for one hundred and ninety nine days. The analysis showed that a total of 556.6km and 495.6hrs were spent by the monitoring team in the field for this activity. When “Gorilla tracking and “Other” work types are combined, we clearly see that the monitoring team spent a total of 1271.2km and 1171.6hrs during this reporting period in the field for monitoring activities (Table 1). However this should have been above so if the team did not spend some time with the Working Dogs for Conservation collecting gorilla dung samples for genetic and disease analysis.

We recorded data at 226 fresh night nest sites, comprising 1,488 individual nests, of Cross River gorilla in the KGS (Table 3). The mean count of nests of weaned individuals was 6.6 per nest site with a range from 1-11. The majority of nest sites were recorded in the northwest

and centre regions of the KGS (Figure 5). Comparing with last year, there was a further extension of the gorillas' home range to the centre east and southwest of the sanctuary suggesting that the gorillas are now feeling secure within the sanctuary. The highest number of individual nest count (11) was recorded in December 2011 and February 2012. We did not record any solitary nest during this reporting period but a solitary black back was recorded by the camera traps we introduced during the reporting period.

Of the 226 fresh night nest sites that were recorded, 11.5% (n=26) were reused night nest sites, and of those 76.9 (n=20) were recorded in the wet season, and 23.1% (n=6) in the dry season. An analysis of dietary data from the sanctuary revealed that 19.2 % (n=5) night nests reused were influenced by fruit availability while the remainder of the nest sites were influenced by the availability of pith, bark, and leaves. Peak fruit availability in KGS normally falls between August and October and there were eight records of nest reuse during that period. Nest site reuse in KGS may be influenced by a number of different factors and not just fruit availability. Gorillas in KGS are confined to a restricted range and so use the same area and seasonal food sources. The total monthly night nest count ranged from 59 to 155 (Table 3). All night nest sites were assigned to a particular group indicating that the trackers were efficient in determining differences between the subgroups of Cross River gorillas in the sanctuary. Two groups (Major and Minor) range separately and the Major group showed signs of fission in seven out of the twelve months of this reporting period (Table 3). Our results are from fresh night nest sites only (1 to 3 days old), to avoid problems with accurate nest counts associated with nest site degradation.

### Aggressive behavior by Cross River gorillas

There were 21 aggressive behaviors (14 from the Major group, 6 from the Minor group and one from J1 group) by gorillas directed at the monitoring team from July 2011 to June 2012 (Table 2). Aggression encounters ranged from one in August to three in July and February with most aggressions recorded in July, February, and April. Aggressive behaviour in most cases was chest-beating, breaking of branches and/or barking by the silverback (Table 2) and occasionally charging at the monitoring team. Chest-beating in gorillas is part of aggressive behavior usually presented by a silverback to scare off other animals or against unrelated silverbacks. The monitoring team retreated in all encounters of aggressive signals to avoid confrontations with the gorillas. This aggressive behavior could be attributed to the presence of infants in the Major and Minor groups.

**Table 2:** Encounters with Cross River gorilla recorded during tracking from July 2011 to June 2012.

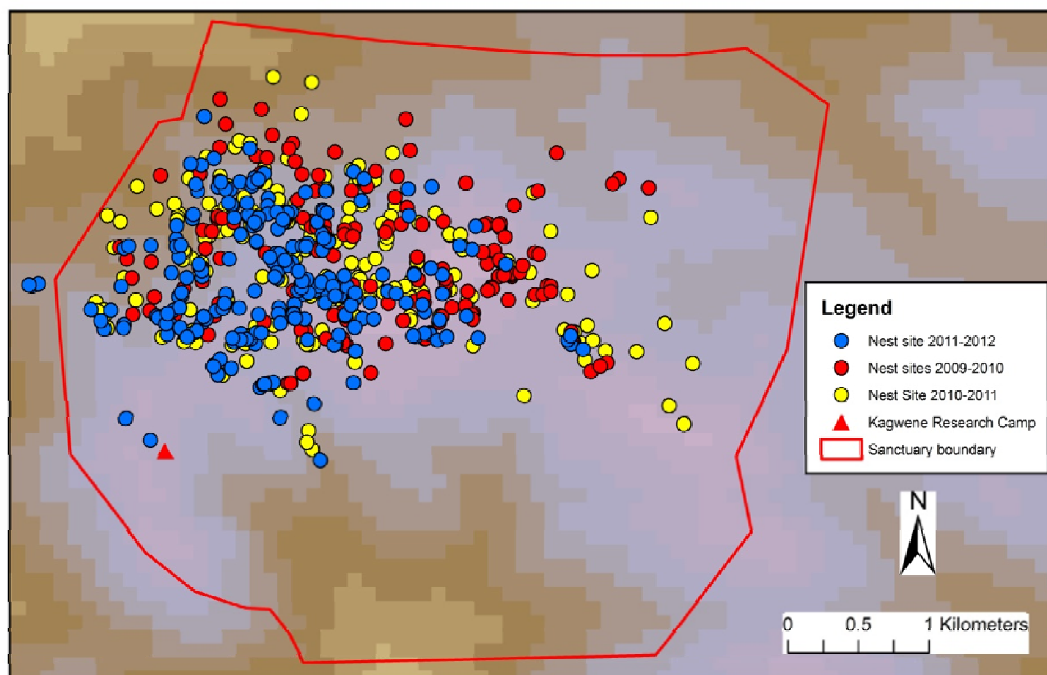
\* J=Major group, N=Minor group, J1=group consisting of 5 gorillas splitting from the Major group and J2= smaller group consisting of 3 gorillas splitting from the Major group.

Month	Encounter with CRG		Group		
	# of times	Type	J	J1	N
July	3	Chest-beating & barking	2		1
August	1	Barking	1		
September	1	Chest-beating & barking	1		
October	2	Chest-beating & barking	1	1	
November	2	Chest-beating & barking	1		1

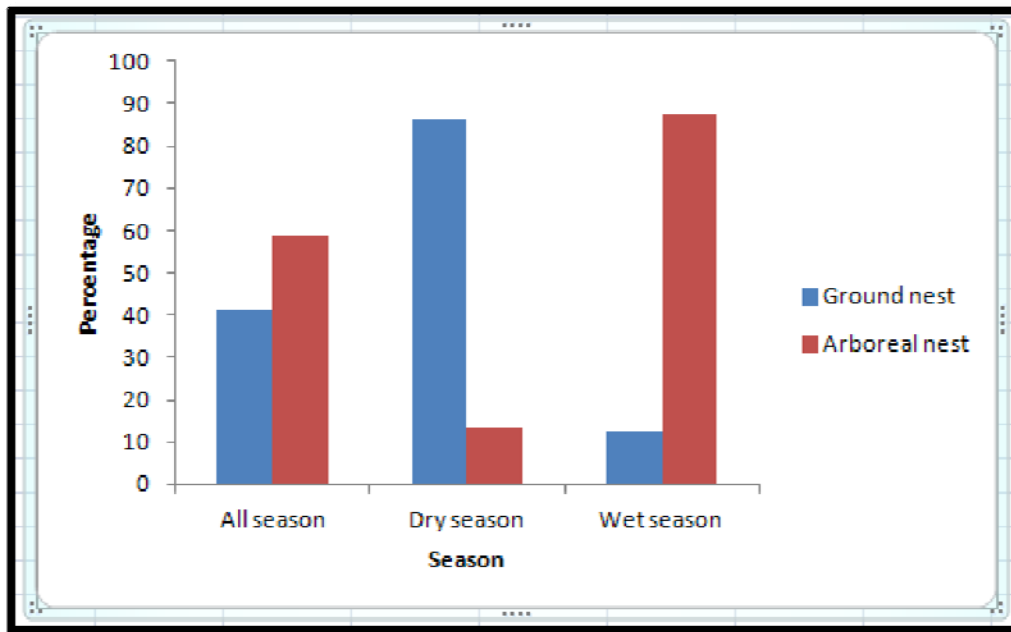
December	1	Barking			1
January	1	Chest beating	1		
February	3	Barking	2		1
March	2	Barking & chest beating	2		
April	3	Barking	1		2
May	-	-	-	-	-
June	2	Chest-beating & barking	2		
<b>Totals</b>	<b>21</b>		<b>14</b>	<b>1</b>	<b>6</b>

### Nest Type Construction at Kagwene Gorilla Sanctuary

From July 2011 to June 2012, Cross River gorillas in Kagwene Gorilla Sanctuary constructed ground nests (41.40%,  $n = 616$ ) and arboreal nests (58.60%,  $n = 872$ ). There are seasonal differences in night nests construction by Cross River gorillas in KGS. Of all 583 night nests recorded in the dry season (November to March) 86.4% ( $n = 504$ ) were ground nest and 13.6% ( $n=79$ ) were arboreal (Figure 6) while in the wet season 12.4% ( $n=112$ ) were ground nest and 87.6% ( $n=793$ ) were arboreal nest. Cross River gorilla nest building in KGS is likely to be influenced most by rainfall, the gorillas preferring to be off the ground during the wetter months. The high percentage of arboreal nests throughout the year as a whole could possibly be linked to disturbance from cattle and humans, including perhaps even our monitoring staff, although this is yet to be proven. The gorillas during this reporting period used a smaller area (Figure 5) of the sanctuary as compared to the previous years. This might be due to the fact that the forest under growth in Kagwene which is made up of mostly *Acanthaceae* dried off during the dry season leaving the forest completely open and the gorillas were using areas of the forest that had undergrowth.



**Figure 5:** Night nest sites in KGS from July 2009 to June 2012.



**Figure 6:** Seasonal Cross River gorilla nest construction in KGS July 2011 to June 2012.

**Table 3:** Parameters of nest sites and monthly sub-groupings data collected in KGS, July 2011 to June 2012.

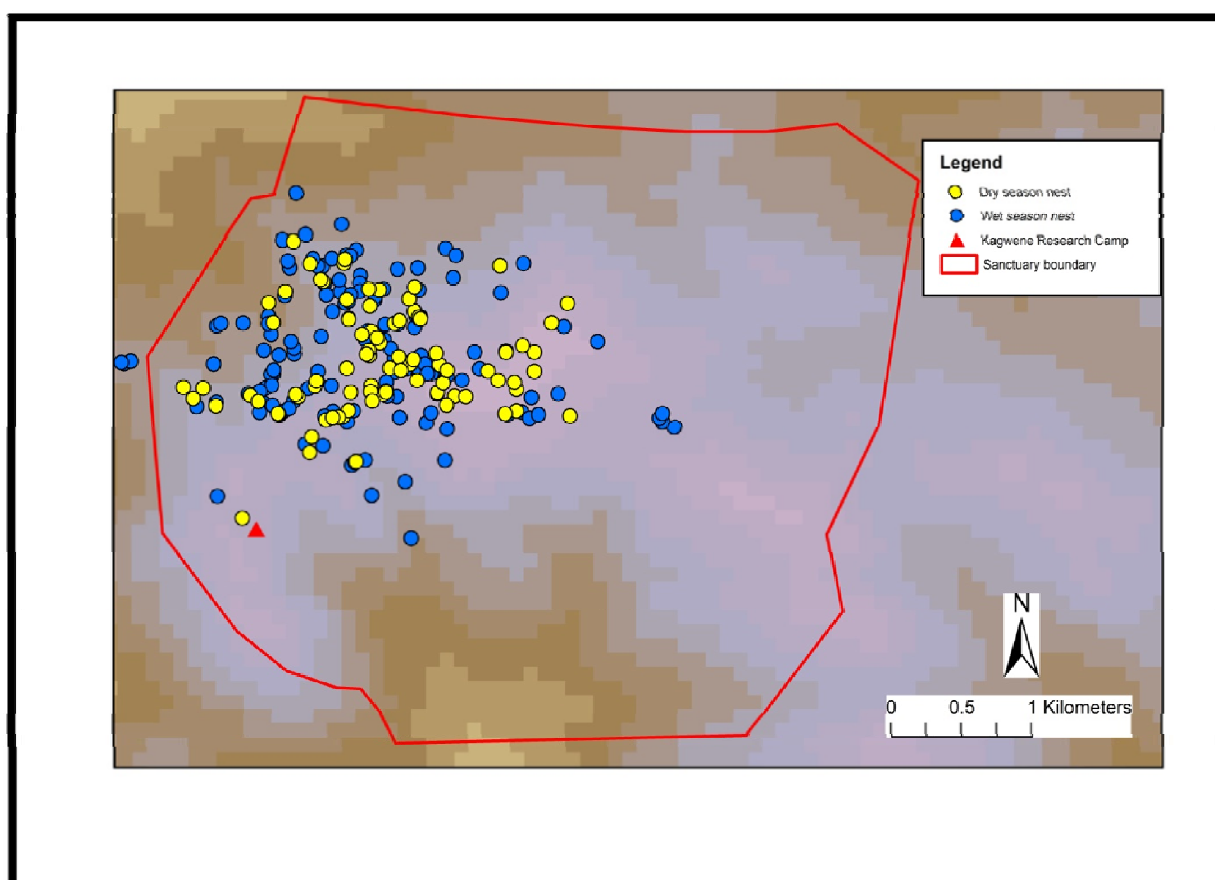
Month	# of days sampled	Total # of nest sites	Total # of nest count	Total # of nest sites per group*				Max # of nest	Min # of nest
				J	J1	J2	N		
July	23	21	135	9	-	1	11	8	4
August	24	23	155	12	2	-	9	9	5
September	20	17	109	8	-	-	9	8	5
October	25	22	139	8	-	1	13	8	4
November	12	11	59	4	-	3	4	8	3
December	14	14	98	7	1	-	6	11	5
January	26	21	126	8	2	2	9	8	3
February	26	21	149	12	-	-	9	11	5
March	27	23	151	13	-	-	10	10	2
April	20	16	108	7	1	-	8	8	5
May	17	16	108	6	-	-	10	6	5
June	24	21	151	13	-	-	8	10	5
<b>Totals</b>	<b>258</b>	<b>226</b>	<b>1488</b>	<b>107</b>	<b>6</b>	<b>7</b>	<b>106</b>		

\* J=Major group, N=Minor group, J1=group consisting of 5 gorillas splitting from the Major group & J2=group consisting of 3 gorillas splitting from the Major group.

**Table 4:** Estimate of number of individuals in the gorilla groups within KGS at the end of the reporting season June 2012.

Age-sex	Major 1	Major 2	Minor Group
Infant/Juvenile	1	0	1
Adult female/ Sub-adult	4	2	5
Silverback	1	1	1
<b>TOTALS</b>	<b>6</b>	<b>3</b>	<b>7</b>

On the 9<sup>th</sup> of May 2012 while tracking the Minor group, an infant gorilla foot print was recorded confirming the presence of an infant in the minor group. On the 13<sup>th</sup> of May 2012 an infant nest was recorded at a night nest site belonging to the major group. With the fission of the major group we currently do not know the exact status of the infant/juvenile.

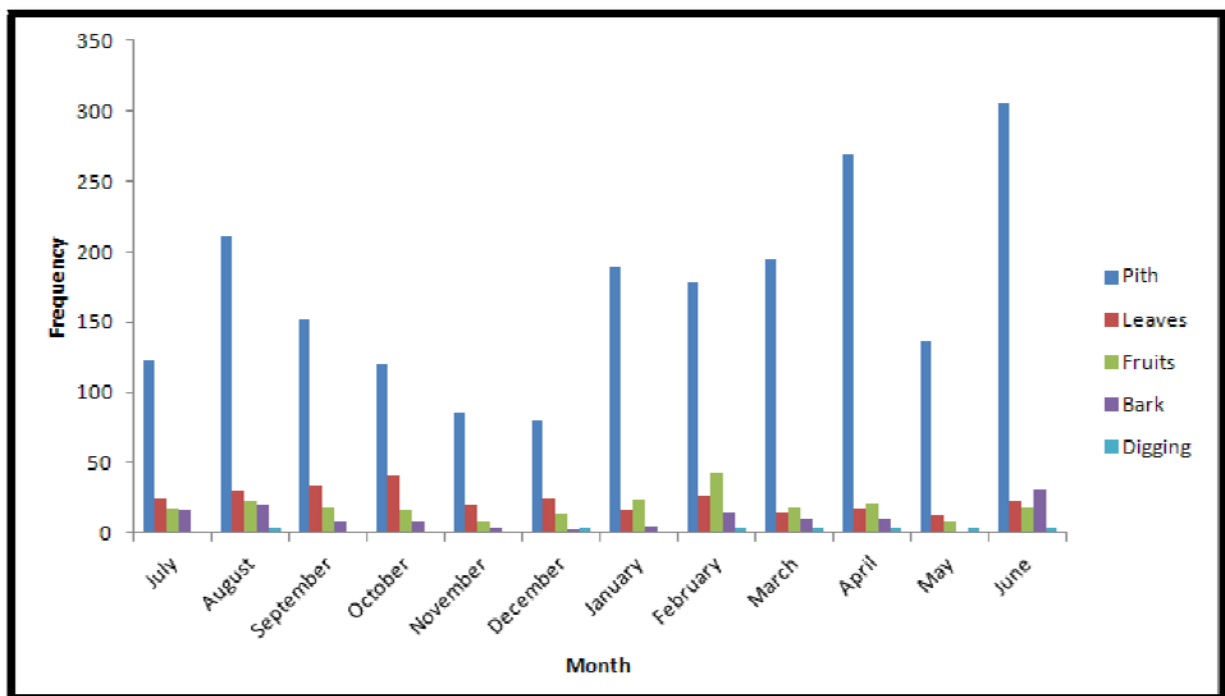


**Figure 7:** Wet and dry season Cross River gorilla night nests in KGS, July 2011 to June 2012.

The gorillas ranged more widely in the wet season (Figure 7) when the abundance of tree fruits was at its highest in different parts of the Sanctuary. In the dry season when fruits were scarce gorillas fed on low quality herbaceous foods that were more consistent and uniform in their availability, such as pith, bark and leaves and hence tended to have short day ranges (Figure 7). However, gorillas spent most of their time in the centre and north western part of the sanctuary, perhaps indicating that foraging is most profitable to them in this area.

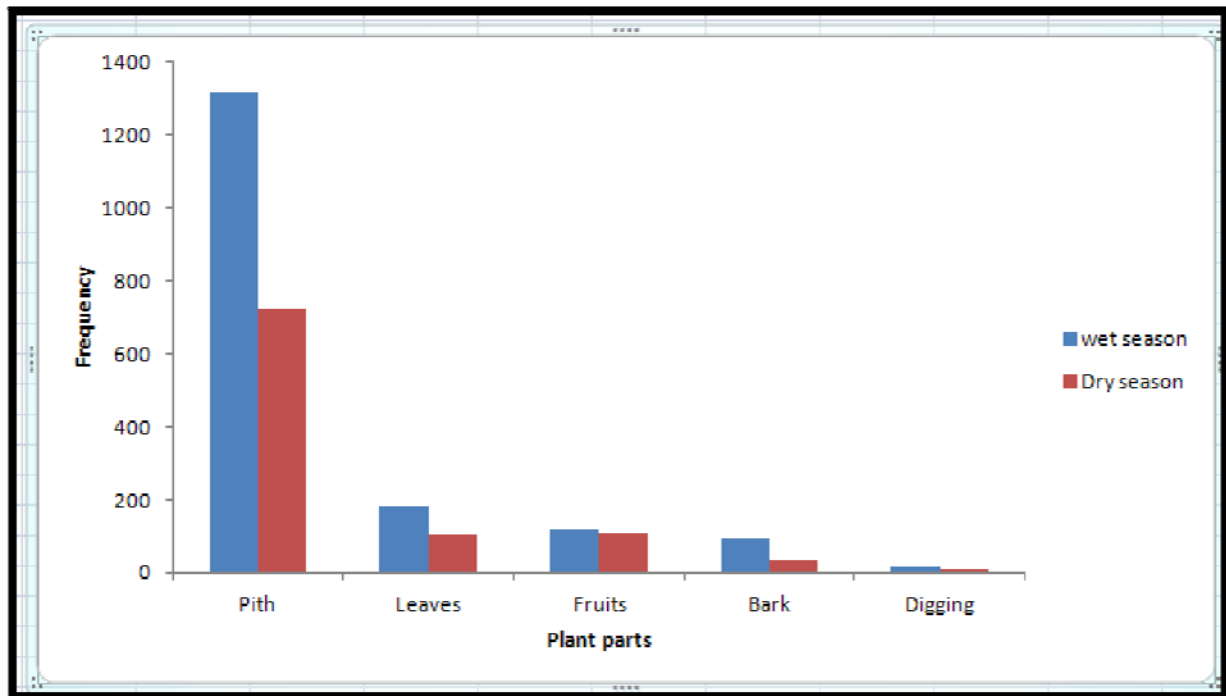
## Gorilla Feeding Ecology

Analysis of the evidence of fresh and recent Cross River gorilla feeding found on trails produced 2,639 records of feeding events. The most commonly eaten plant parts were pith (66.3%), leaves (16.9%) and fruits (11.2%) (Figure 8). The data shows an interesting picture of the plant parts eaten by the gorillas with a peak in fruits in January and February and bark in June 2012. The gorillas constantly fed on bark throughout the year. There is need to investigate the tree species and nutritional content of the tree bark eaten by gorillas in Kagwene gorilla sanctuary as studies in other lowland gorilla sites suggest that bark is or can be a source of protein for gorillas (Rogers et al 1990). This data set is biased towards more easily identifiable ground level plant parts as we started the identification of plant species in April 2012.



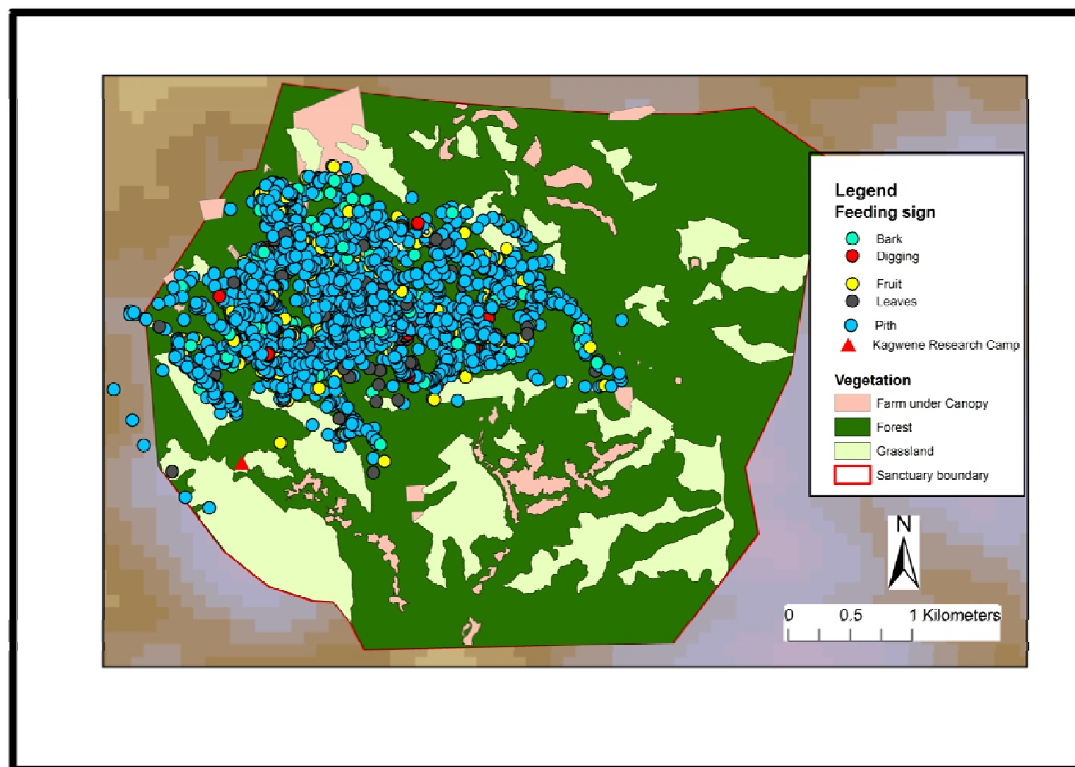
**Figure 8:** Patterns of Cross River gorilla feeding signs in KGS, July 2011 to June 2012.

The ranging pattern of the gorillas could be influenced by the presence of herbaceous plant material (pith) and ripe fruits. In January, February and March, the gorillas ate more fruits and pith consumption was slightly decreased (Figure 8) indicating the importance of fruits in the diet of Cross River gorilla in KGS. It would be interesting to investigate the fruiting plant patterns eaten by gorillas in KGS as the fruiting during July 2009 to June 2010 was in September 2009, July 2010 to June 2011 peak was January 2011 but during this reporting period the fruiting peak was in February 2012 when most fig trees fruited. This will assist to understand whether there is any influence by ripe fruits on the ranging pattern of the gorillas. The data collected does show an interesting picture of the distribution of these feeding signs within the area that the three groups are currently ranging (Figure 10). Apart from plant parts we also recorded feeding signs on black ants (*Dorylus sp.*) and termites by gorillas in the Sanctuary during this reporting period. However no tools were seen at the feeding sites.



**Figure 9:** Seasonal feeding pattern by gorillas in KGS, July 2011 to June 2012.

In KGS leaf flush occurred in March, April, and May at the beginning of the wet season and gorillas took advantage by feeding on high quality young leaves at a time when fruits are traditionally scarcer (Figure 8). This year fruits were eaten during the months of January and February which coincided with the peak of dry season (Figure 2 & Figure 8). However, more fruits were consumed by gorillas in the wet season than in the dry season (Figure 9).

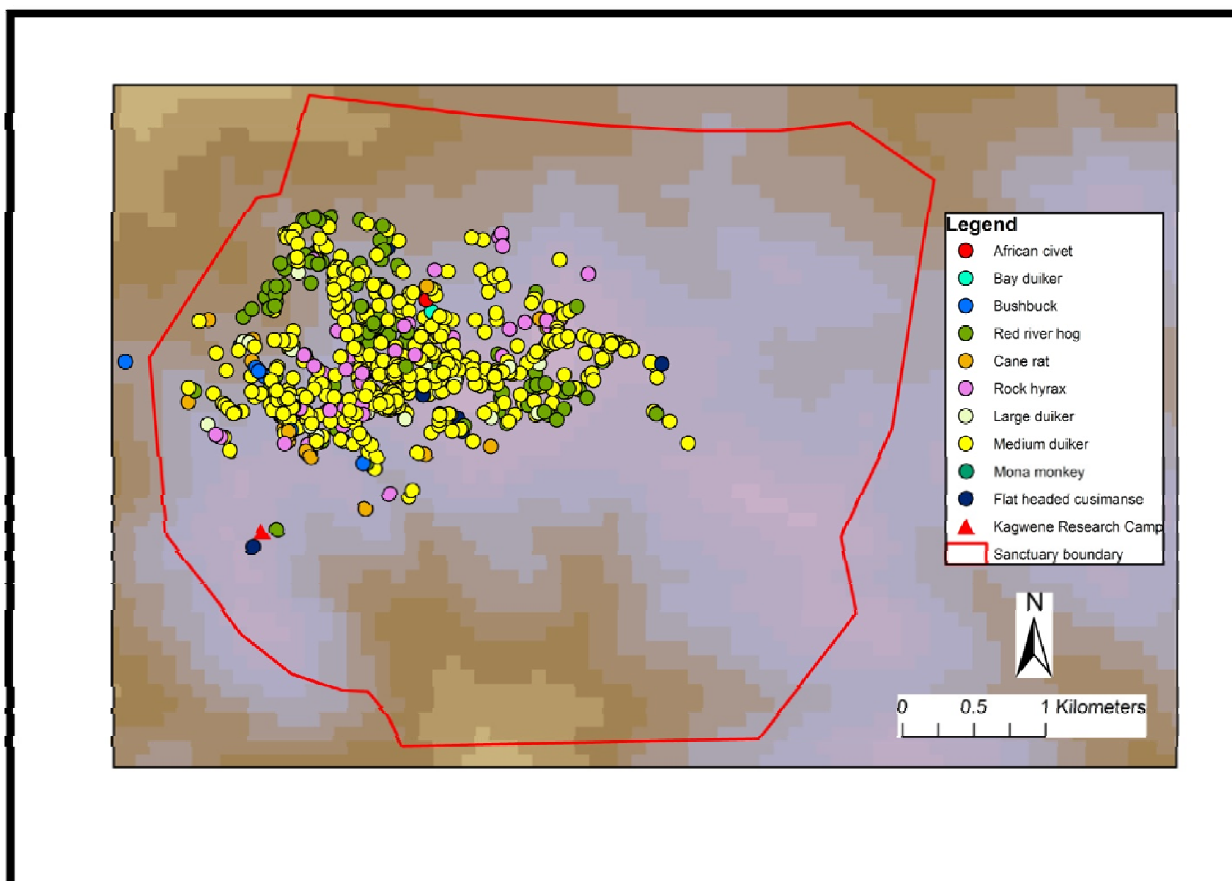


**Figure 10:** Location of top five most commonly recorded gorilla foods on gorilla trails in KGS, July 2011 to June 2012.

In February 2012 when fruits from Rubiaceae (Coffee), *Ficus sp.* and *Aframommum sp.* were abundant; the monthly gorilla tracking trails was longer than any other month indicating that Cross River gorillas travelled long daily distances (Figure 10) as compared to the other months when they fed on leaves, herbaceous pith or stems and bark from trees. Cross River gorillas fed on the bark of *Garcinia sp.*, *Landolphia sp.*, *Ficus sp.*, *Rubiaceae sp.* (Coffee) and roots of *Ficus sp.*

### Wildlife species and Habitat

Signs of fourteen large mammal species were recorded along gorilla trails (Table 6 & Table 7). Medium duikers had the highest encounter rate while the genet and African civet had the least (Figure 12 & Table 7). The Mona monkey was recorded in the sanctuary for the first time in gorilla tracking trails. Most wildlife species are distributed evenly across the sanctuary in areas where the gorillas range (Figure 11) though rock hyrax is restricted to rocky areas. Brush-tailed porcupine and Preuss's monkeys, also, for some reason, seem to restrict their ranging to particular parts of the sanctuary presumably those areas where hunting pressure is least as these would be sought after prey by humans. However above 88% of mammals were recorded in montane forest.



**Figure 11:** Geographic location of large mammal species sign encountered during tracking gorilla trails in KGS, July 2011 to June 2012.

**Table 5:** Large mammal habitat records (percentage of waypoints for each habitat type) in KGS, July 2011 to June 2012.

Species	Montane forest	Secondary forest	Rock/bare	Grassland	Herb patch	Active farm	Old farm
Gorilla	98.3	0.0		0.6	1		0.1
Mona monkey	100						
Preuss's monkey	100						
Putty-nosed monkey	100						
African civet	100						
Flat-headed cusimanse	100						
Bay duiker	100						
Large duikers	100						
Medium duiker	99.8				0.2		
Small duikers	100						
Bushbuck	75			25			
Red river hog	98.2	1.2					0.6
Cane rat	42.9			47.6	9.5		
Rock hyrax	93.5		1.6	3.2	1.6		
Brush-tailed porcupine	100						

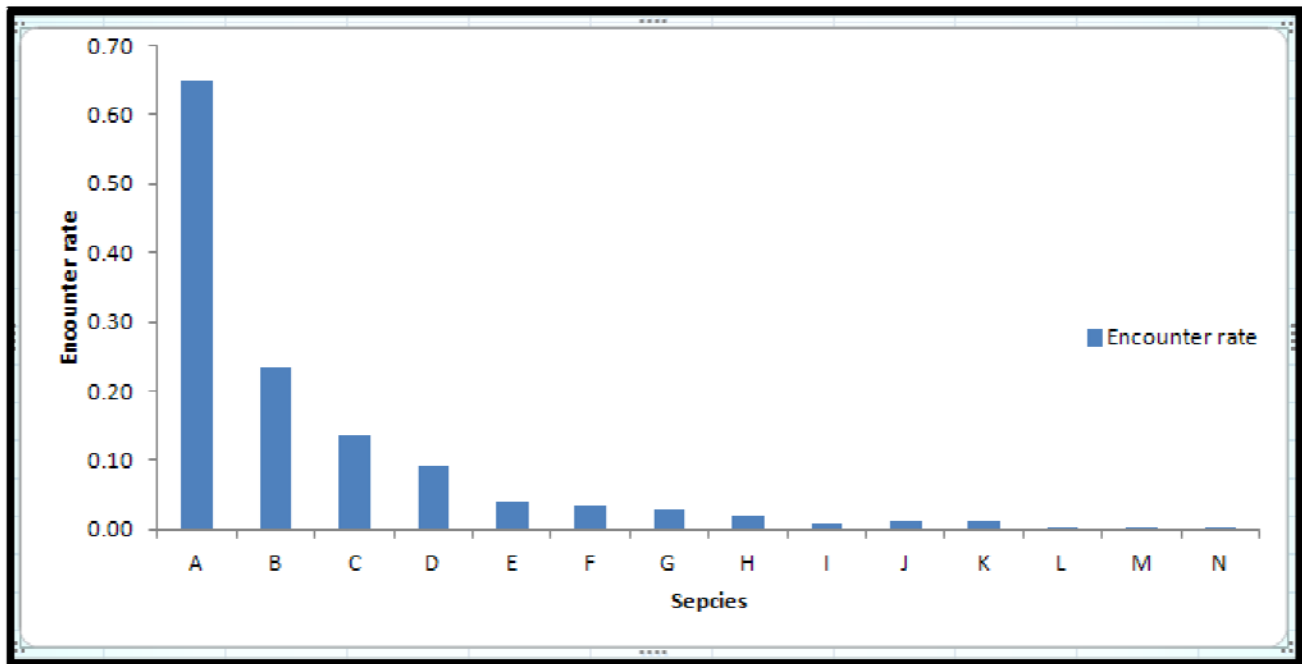
**Table 6:** Frequency of observations of fresh and recent large mammals sign whilst tracking to gorilla nest sites in KGS, July 2011 to June 2012.

Month	Mona monkey	Preuss's monkey	Putty-nosed monkey	Medium duikers	Larger duikers	Small duikers	Bush buck	Bay duiker	Red river hog	African civet	Flat headed cusimanse	Brush-tailed porcupine	Rock hyrax	Cane Rat
July		5	2	20	2	6	1		11		1		2	8
August		3		39	7	1			14		1	1	5	
September		11	8	20	4	4	1		45				1	1
October	2	5		19	2	8			23		4		5	
November		1		12	2				13					
December		2		15	1	2			10				6	3
January		6	1	37	2				19			6	12	
February		23	1	74				1	12	1		1	13	3
March		11	1	51	8	1	1		4				5	3
April		14		73	1		3		5				9	1
May		2	1	20		1	2		7				4	
June		14		84		1			4		1		3	2
<b>Total</b>	<b>2</b>	<b>97</b>	<b>14</b>	<b>464</b>	<b>29</b>	<b>24</b>	<b>8</b>	<b>1</b>	<b>167</b>	<b>1</b>	<b>7</b>	<b>8</b>	<b>65</b>	<b>21</b>

**Table 7:** Encounter rate (per km) of fresh and recent large mammal sign whilst tracking to gorilla nest sites in KGS, July 2011 to June 2012.

Month	Mona monkey	Preuss's monkey	Putty-nosed monkey	Medium duikers	Larger duikers	Small duikers	Bush buck	Bay duiker	Red river hog	African civet	Flat headed cusimanse	Brush-tailed porcupine	Rock hyrax	Cane Rat
July		0.08	0.03	0.31	0.03	0.10	0.02		0.17		0.02		0.03	0.13
August		0.04		0.51	0.09	0.01			0.18		0.01	0.01	0.07	
September		0.29	0.21	0.51	0.10	0.10	0.03		1.17				0.03	0.03
October	0.07	0.17		0.64	0.07	0.27			0.77		0.13		0.17	
November		0.07		0.86	0.14				0.93					
December		0.09		0.71	0.05	0.09			0.47	-			0.28	0.14
January	-	0.17	0.03	1.03	0.06	-	-	-	0.53	-		0.17	0.33	-
February	-	0.15	0.01	0.48	-	-	-	0.01	0.08	0.01		0.01	0.08	0.02
March	-	0.13	0.01	0.62	0.10	0.01	0.01	-	0.05	-		-	0.06	0.04
April	-	0.20	-	1.02	0.01	-	0.04	-	0.07	-		-	0.13	0.01
May	-	0.03	0.02	0.34		0.02	0.03	-	0.12	-		-	0.07	-
June		0.18		1.05		0.01			0.05		0.01		0.04	0.03
<b>Encounter rate</b>	<b>0.003</b>	<b>0.136</b>	<b>0.020</b>	<b>0.649</b>	<b>0.041</b>	<b>0.034</b>	<b>0.011</b>	<b>0.001</b>	<b>0.23</b>	<b>0.001</b>	<b>0.010</b>	<b>0.011</b>	<b>0.091</b>	<b>0.030</b>

Mona monkeys were heard vocalizing within the sanctuary on the Alumfa area for the first time in October 2011 and later on in January 2012. Red river hogs which were first recorded in the sanctuary in 2010 during dry season wildlife surveys in the northwestern part of the sanctuary were also present throughout the reporting period within the sanctuary. During this reporting period its range had expanded to cover the same area as the Cross River gorilla (Figure 12 & Figure 14). Palm civet was not recorded while tracking gorillas during this reporting period; however it was recorded while conducting “Other” work type within the sanctuary.

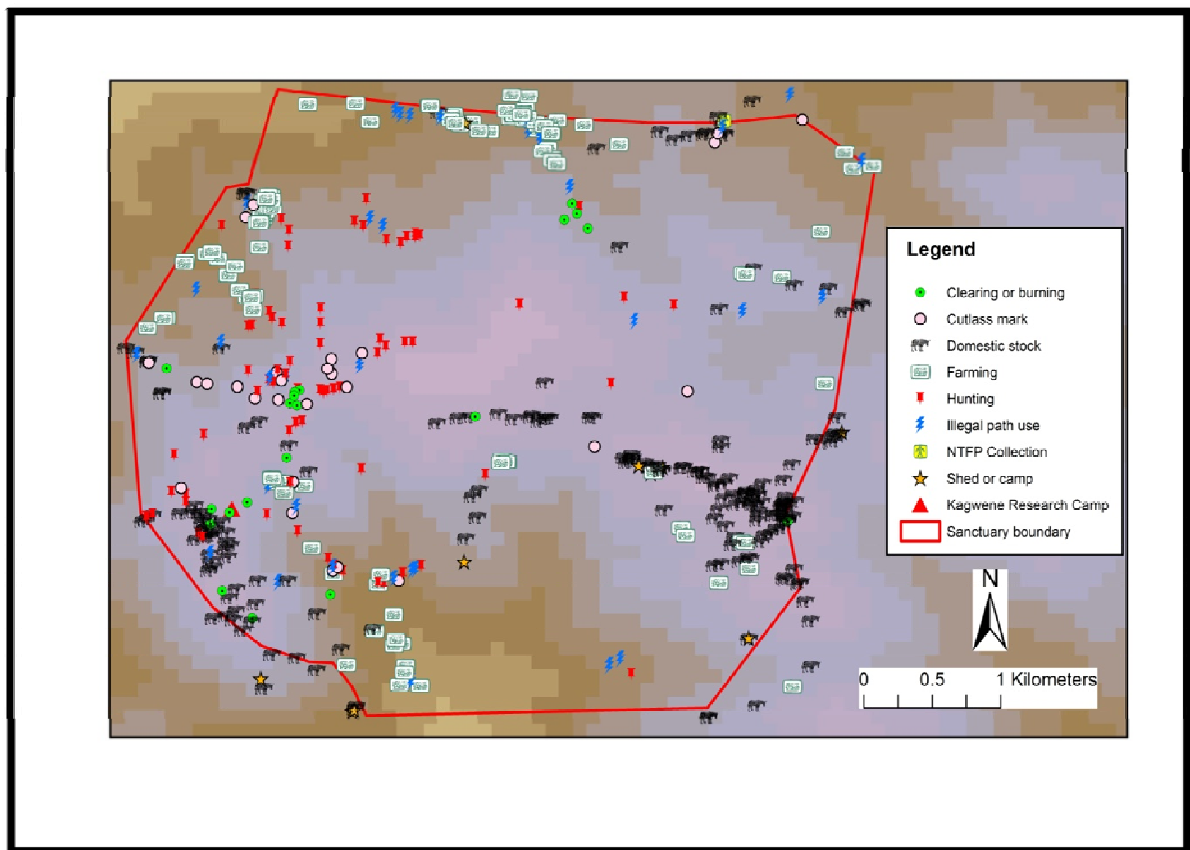


**Figure 12:** Encounter rates (per km) for large mammal recorded while tracking Cross River gorilla in KGS, July 2011 to June 2012.

A=Medium duiker, B=Red river hog, C=Preuss’s monkey, D=Rock hyrax, E=Larger duiker, F= Small duiker, G=Cane rat, H=Putty-nosed monkey, I=Flat-headed cusimanse, J=Brushed tailed porcupine, K=Bushbuck, L=Mona monkey, M=Bay duiker, N=African civet

#### *Human activity*

Domestic stock, farming and hunting are the main human pressures within KGS. Most of the active farms with annual crops were recorded on the Kenchi, Alumfa, and Ayi section of the sanctuary while few active farms were recorded on Ekaw and Ngwo areas. However domestic stock (cattle, goats, sheep and horses) were common on the grassland patches within the sanctuary (Figure 13 & Figure 22). Wire snares were recorded mostly around Kenchi-Alumfa section of the sanctuary coinciding with the core area for gorillas and other wildlife species found within the sanctuary.



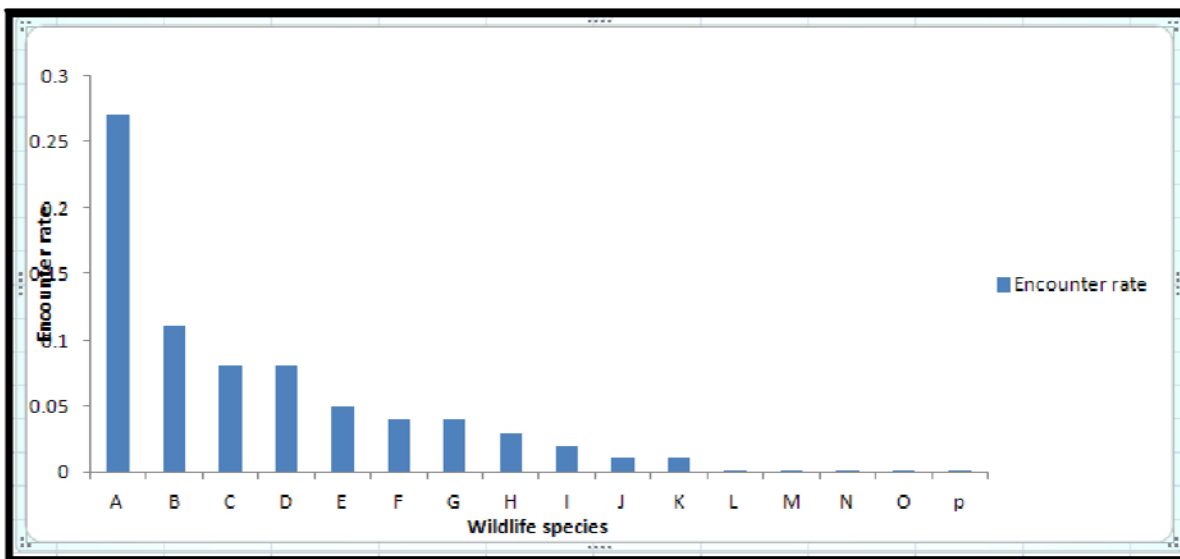
**Figure 13:** Human activities recorded within KGS, July 2011 to June 2012.



**Photo 1:** Used cartridges, wires snares, and traps removed from the sanctuary by MINFOF Ecoguards during the reporting period, July 2011 to June 2012. (©WCS/TMLP 2012)

## 2. Returning from Cross River Gorilla (RCRG) or “Other” Type of work

Encounter rates (Figure 14) are lower than those of last reporting period because gorillas occupied a smaller portion of the sanctuary as a result the under growth drying off during the dry season during this reporting period. Signs of sixteen large mammal species were recorded along returning from Cross River gorilla or “Other” type of work tracks. Medium duikers had the highest encounter rate while the palm civet, Putty-nose monkey, Mona monkey, African civet, and otter had the least (Table 8 & Table 9). The Mona monkey was recorded in the sanctuary for the first time. Most wildlife species are distributed evenly across the sanctuary in areas where the gorillas range (Figure 11) though rock hyrax is restricted to rocky areas. Brush-tailed porcupine and Preuss’s monkeys, also, for some reason, seem to restrict their ranging to particular parts of the sanctuary presumably those areas where hunting pressure is least as these would be sought after prey by humans. However above 88% of mammals were recorded in montane forest (Figure 15).



**Figure 14:** Encounter rate of large mammal signs recorded on "Other" work type during the reporting period.

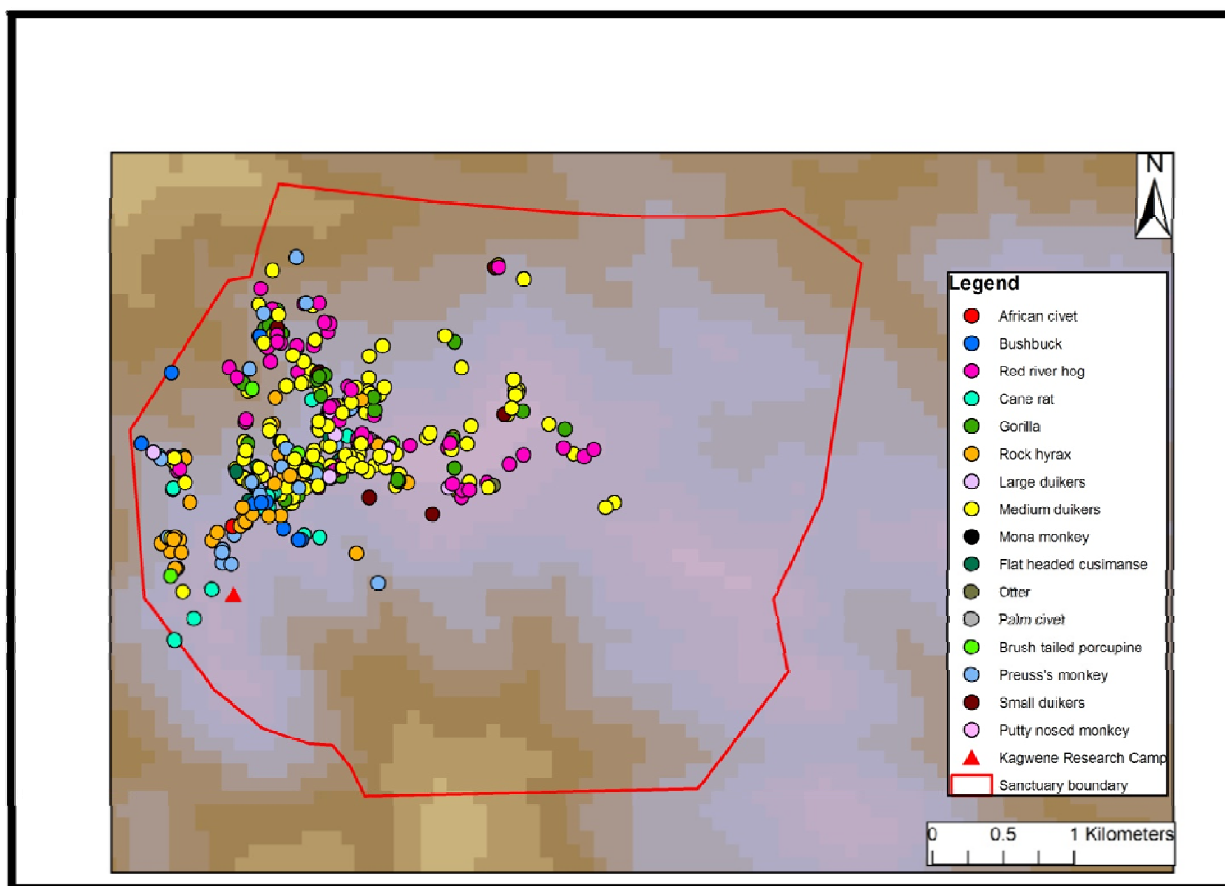
A=Medium duiker, B=Red river hog, C=Rock hyrax, D=CRG, E=Preuss’s monkey, F=Cane rat, G=Large duikers, H=Bushbuck, I=Small duiker, J=Flat-headed cusimanse, K=Brush-tailed porcupine, L=Palm civet, M=African civet, N=Putty-nosed monkey, O=Mona monkey, P=Otter.

**Table 8:** Frequency of observations of fresh and recent large mammal sign recorded on "Other" work type during the reporting period, July 2011 to June 2012

Month	Gorilla	Putty-nosed monkey	Preuss's monkey	Mona monkey	Medium duikers	Small duikers	Larger duikers	Bush buck	Red river hog	Palm civet	African civet	Flat headed cusimanse	Otter	Rock hyrax	Brush tailed porcupine	Cane Rat
July	5	1	2		16	6	1	1	4	1		2		2		8
August	11				19	2		1	3					2		
September					4			1	2							
October			3		11		2	1	2			2		2		8
November	1		1		9		2		12					6		1
December	2		2		26	4	6		24		1	1		15	2	1
January	12		4	1	6		4		5			1		2		1
February	2		2		12				5					6		
March	5		4		10	1	4	2	2					4		1
April	3		5		18		1	3	2					3	2	3
May	1		2		5		2	4	2							
June	3		3		12			2				1	1	4		
<b>Totals</b>	<b>45</b>	<b>1</b>	<b>28</b>	<b>1</b>	<b>148</b>	<b>13</b>	<b>22</b>	<b>15</b>	<b>63</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>46</b>	<b>4</b>	<b>23</b>

**Table 9:** Encounter rate (per km) of fresh and recent large mammal sign recorded on "Other" work type during the reporting period, July 2011 to June 2012

Month	Gorilla	Putty-nosed monkey	Preuss's monkey	Mona monkey	Medium duikers	Small duiker	Larger duikers	Bush buck	Red river hog	Palm Civet	African Civet	Flat headed cusimanse	Otter	Rock hyrax	Brush-tailed porcupine	Cane Rat
July	0.08	0.02	0.03		0.25	0.09	0.02	0.02	0.06	0.02		0.03		0.03		0.13
August	0.14				0.24	0.03		0.01	0.04					0.03		
September					0.12			0.03	0.05							
October			0.11		0.41		0.07	0.04	0.07			0.07		0.07		0.30
November	0.05		0.05		0.43		0.10		0.57					0.29		0.05
December	0.05		0.05		0.62	0.09	0.14		0.57		0.02	0.02		0.36	0.05	0.02
January	0.31		0.10	0.03	0.15		0.10		0.13			0.03		0.05		0.03
February	0.02		0.02		0.11				0.05					0.06		
March	0.06		0.05		0.12	0.01	0.05	0.02	0.02					0.05		0.01
April	0.04		0.07		0.27		0.01	0.04	0.03					0.04	0.03	0.04
May	0.01		0.05		0.12		0.05	0.10	0.05							
June	0.04		0.04		0.16			0.03				0.01	0.01	0.05		
<b>Encounter rate</b>	<b>0.081</b>	<b>0.002</b>	<b>0.050</b>	<b>0.002</b>	<b>0.266</b>	<b>0.023</b>	<b>0.040</b>	<b>0.027</b>	<b>0.113</b>	<b>0.002</b>	<b>0.002</b>	<b>0.013</b>	<b>0.002</b>	<b>0.083</b>	<b>0.007</b>	<b>0.041</b>



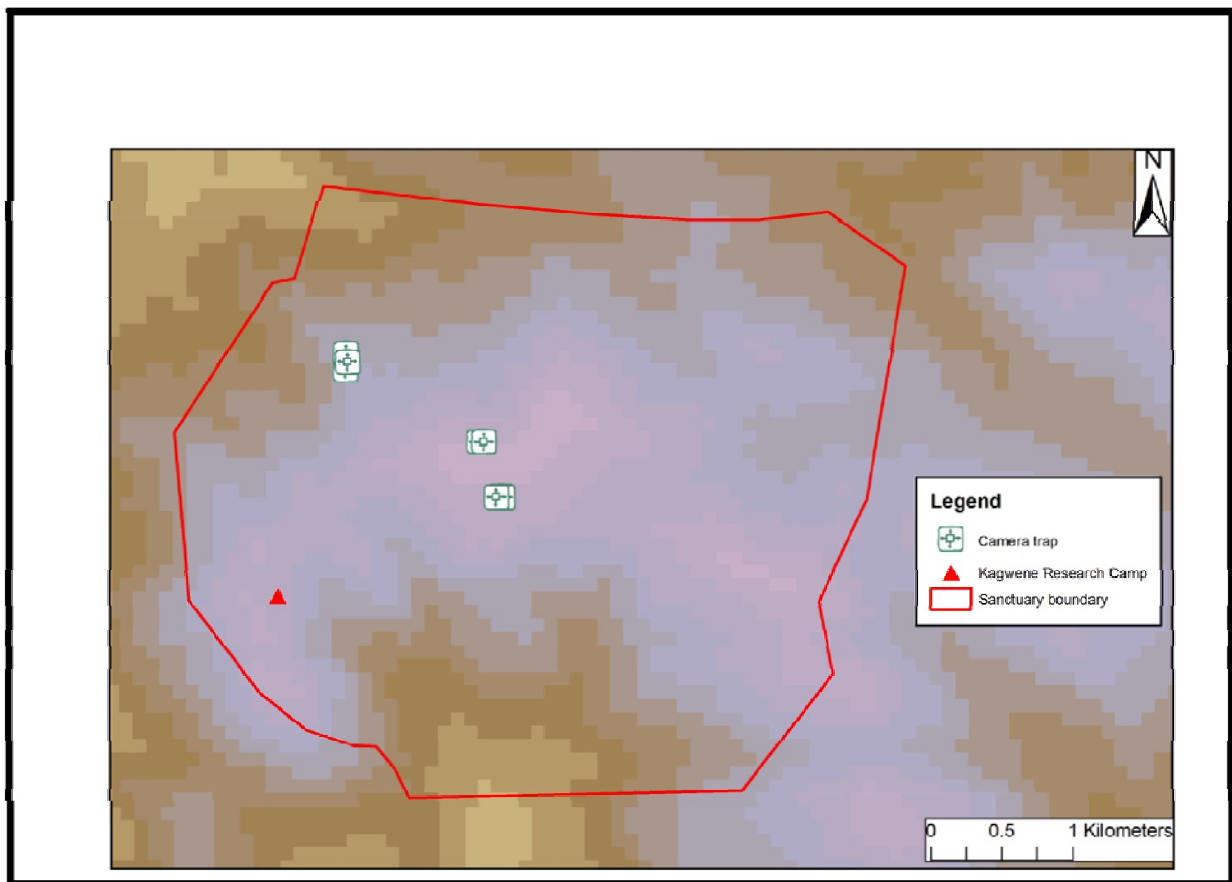
**Figure 15:** Large mammal records recorded during "Other" type of work during the reporting period, July 2011 to June 2012.

### 3. Camera traps

The initial camera trapping activities established during this reporting period have proven extremely successful and encouraging, revealing some of the best images of Cross River gorillas to date. These images have not only indicated important information about the gorilla population, but have also led to increased international publicity and awareness about the rarity of the Cross River gorilla.

Initially five camera traps were set up in the sanctuary at three different trails commonly used by gorillas in the forest but we later on deployed three more cameras to give a total of eight (Figure 16). In order to photograph both directions of passing animals especially the Cross River gorilla, a pair of cameras was set up with one camera on either side of the trail facing each other and the cameras were angled slightly away from each other to prevent the flashes interfering with each other.

In the very first video of 8<sup>th</sup> March to 18<sup>th</sup> April 2012, the major group consisting of about 8 gorillas was captured with one of the gorillas having an injured hand probably from a wire snare while in another video (18<sup>th</sup> April to 23<sup>rd</sup> May 2012) a pregnant gorilla was captured.

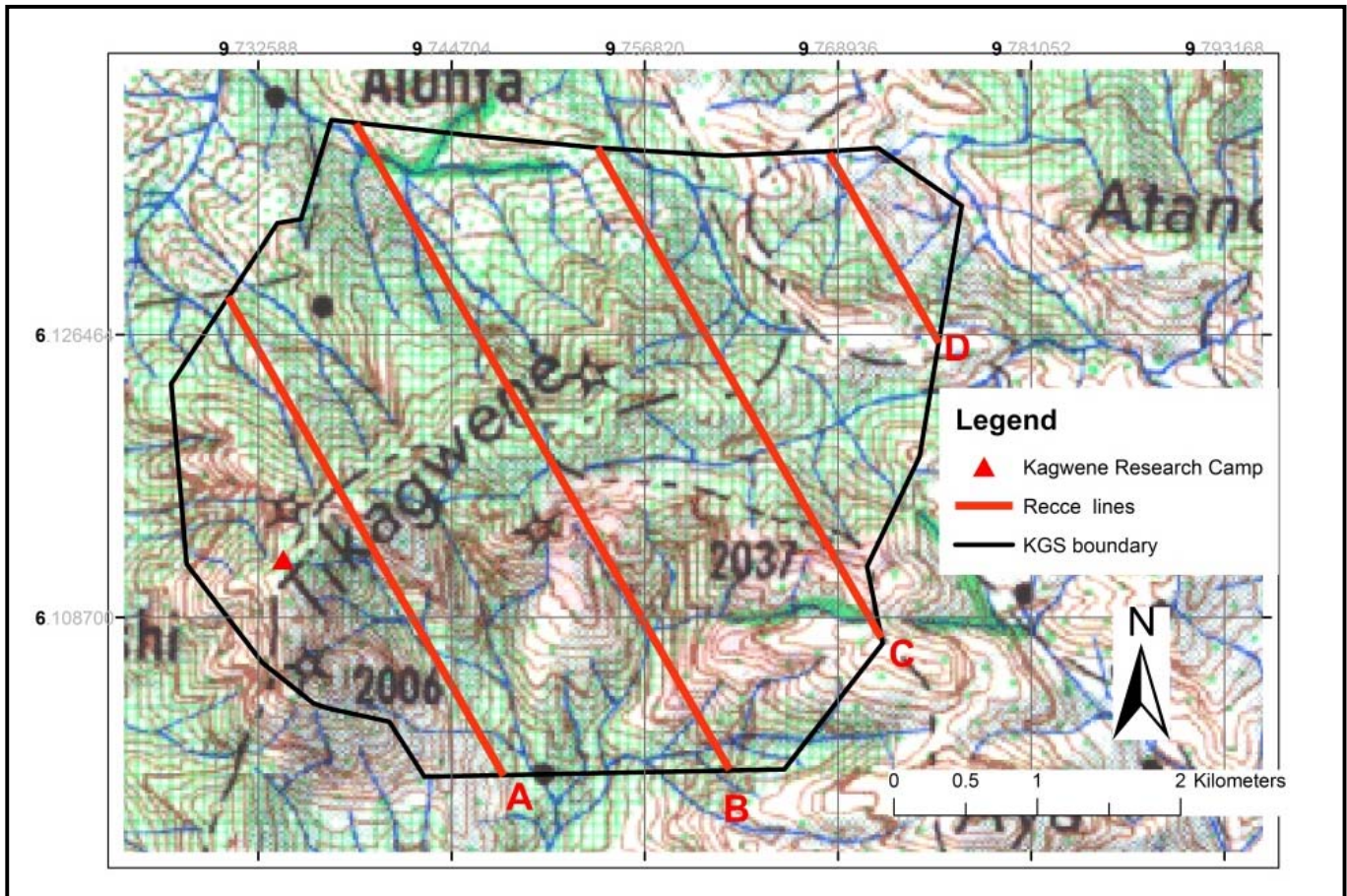


**Figure 16:** Camera traps in KGS from March 2012 to June 2012.

Other wildlife species captured by camera traps during this reporting period include genet, bay duiker, and flat-headed cusimanse.

### 3. ANNUAL WILDLIFE SURVEY

Two wildlife surveys both in the wet and dry season were carried out in the sanctuary during this reporting period covering a total distance of 38.19km and total time spent was 48.94hrs (Table 10).



**Figure 17:** Layout of recce lines within the KGS for wildlife surveys.

#### *Wildlife Species*

There are slight increases in the abundances of most wildlife species recorded this year as compared to last year (Table 11). The flat-headed cusimanse, which was not recorded in the first wildlife survey, was recorded this year. However some wildlife species found in the sanctuary were not also observed during this survey.

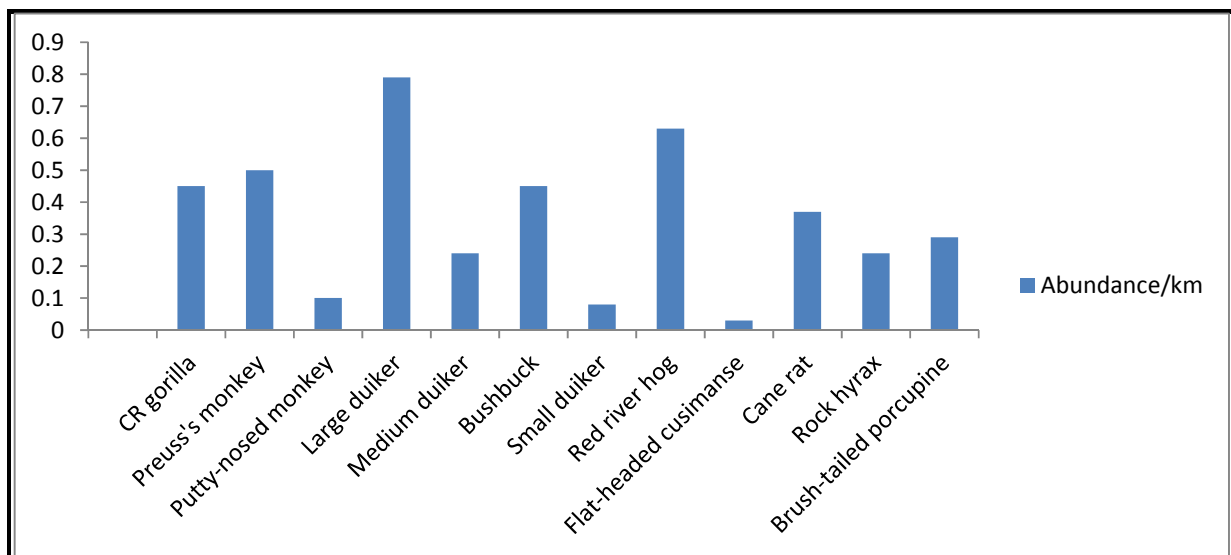
**Table 10:** Wildlife survey patrol effort in KGS, September 2011 and February 2012

Date	Patrols	Distance covered (kilometers)	Time taken (hours)
10/09/2011	1	1.41	1.66
11/09/2011	1	4.61	7.59
12/09/2011	1	1.04	2.07
13/09/2011	1	3.43	4.81
14/09/2011	1	2.26	3.50
15/09/2011	1	1.97	2.63
23/02/2012	1	1.79	2.16
24/02/2012	1	3.00	3.90
25/02/2012	1	2.80	3.86
26/02/2012	1	4.47	6.32
27/02/2012	1	3.41	3.76
28/02/2012	1	5.71	5.26
29/02/2012	1	2.29	1.42
<b>Totals</b>	<b>13</b>	<b>38.19</b>	<b>48.94</b>

Twelve large mammal species were recorded during the wildlife survey (Table 11 & Figure 18). The most frequently encountered were the large duiker, Red river hog, Preuss's monkey, and Cross River gorilla. The least frequently encountered were the small duikers and the flat-headed cusimanse. The otter which was observed in the sanctuary for the first time during the 2010/2011 wildlife survey was not recorded this year.

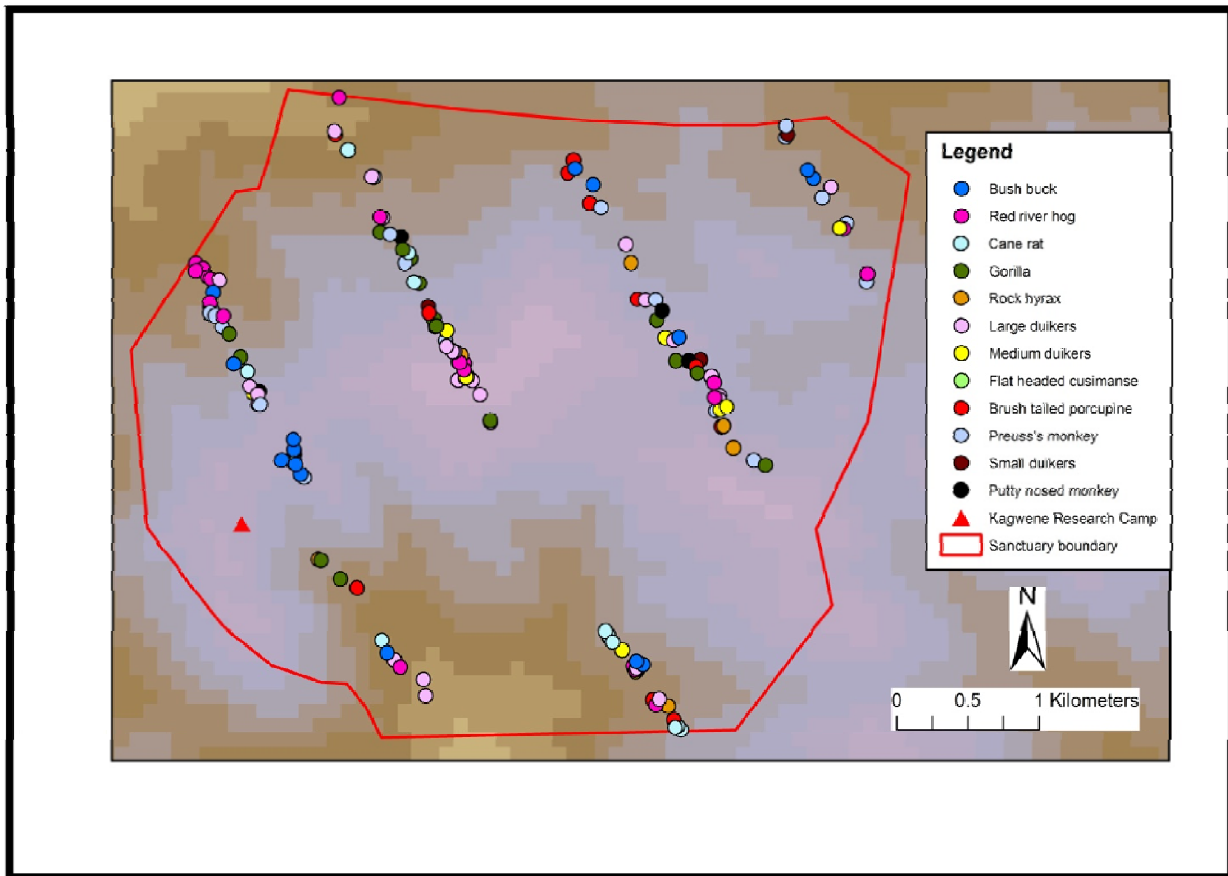
**Table 11:** Frequency and encounter rates of large mammal signs recorded in KGS during two sampling seasons, September and February 2012.

Species	Wet season	Dry season	Total	Abundance/km (2011/2012)	Abundance/km (2010/2011)
CR gorilla	10	7	17	0.45	0.16
Preuss's monkey	9	10	19	0.50	0.24
Putty-nosed monkey	2	2	4	0.10	0.21
Large duiker	19	11	30	0.79	0.52
Medium duiker	5	4	9	0.24	0.05
Bushbuck	4	13	17	0.45	0.16
Small duiker	2	1	3	0.08	0.03
Red river hog	11	13	24	0.63	0.16
Flat-headed cusimanse	1		1	0.03	-
Cane rat	8	6	14	0.37	0.24
Rock hyrax	4	5	9	0.24	0.10
Brush-tailed porcupine	7	4	11	0.29	0.13

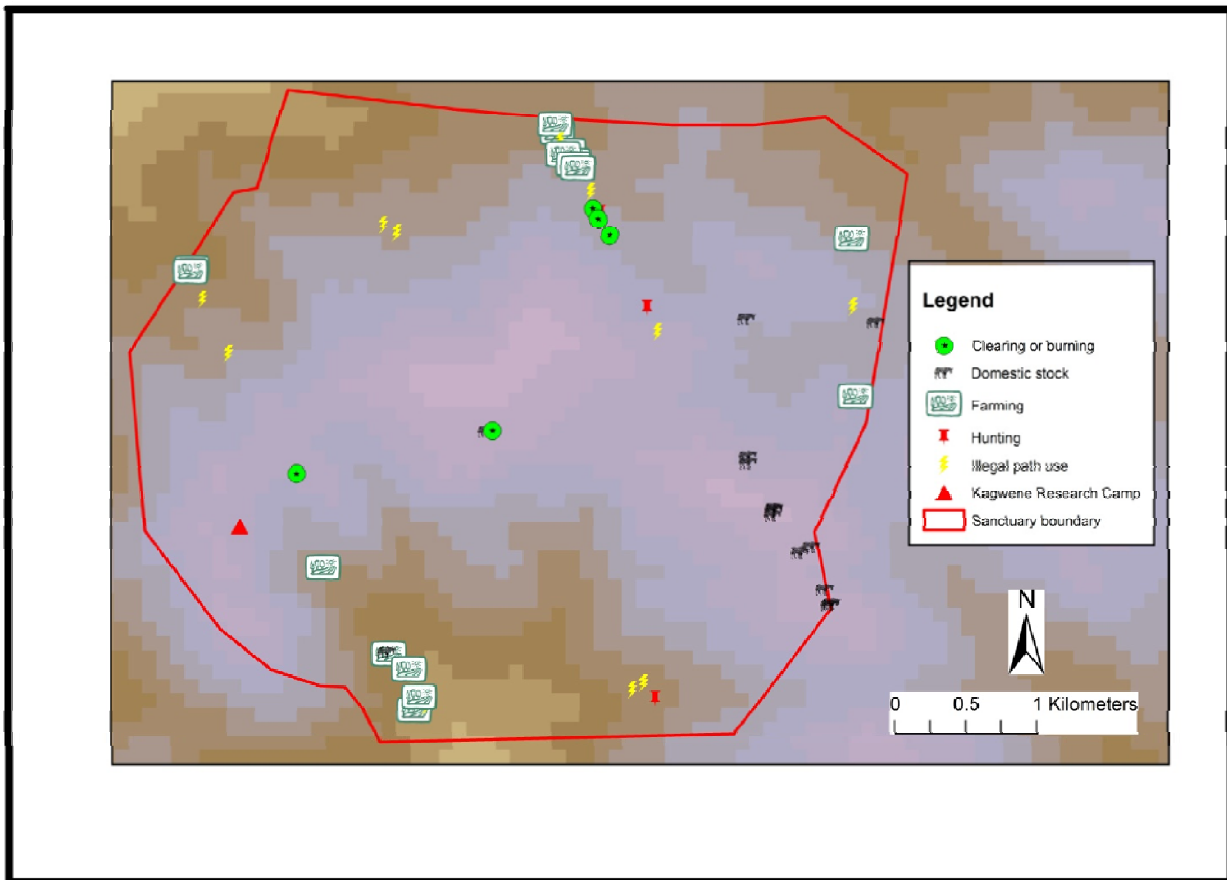


**Figure 18:** Encounter rate of wildlife species recorded during seasonal wildlife surveys in KGS July 2010 to June 2011.

This is the second complete seasonal wildlife survey in KGS. The otter and genet which were recorded for the first time in the sanctuary during last year surveys was missed out this year. Other wildlife species like Mona monkey, palm civet, and African civet that had been recorded during Cross River gorilla tracking were not documented while conducting the large mammal survey (Table 11 & Figure 19).



**Figure 19:** Location of wildlife species recorded in KGS during wildlife surveys, July 2011 to June 2012.



**Figure 20:** Location of human activity signs in KGS during wildlife surveys, July 2011 to June 2012.

### *Human Pressure*

Active farms were recorded on the Chikwa, Bantapka, and Ayi sections of the sanctuary (Figure 19). There is need for more sensitization talks with the chiefs of the concerned communities to handle this encroachment issues. The old farms were abandoned and we are hoping that with time these farms will change to secondary forest and finally primary forest. The fires recorded were in grassland areas (Figure 20) and this can only be stopped when the grazers finally leave the sanctuary this coming dry season as promised.

#### 4. ANTI-POACHING PATROLS (MINFOF PATROLS)

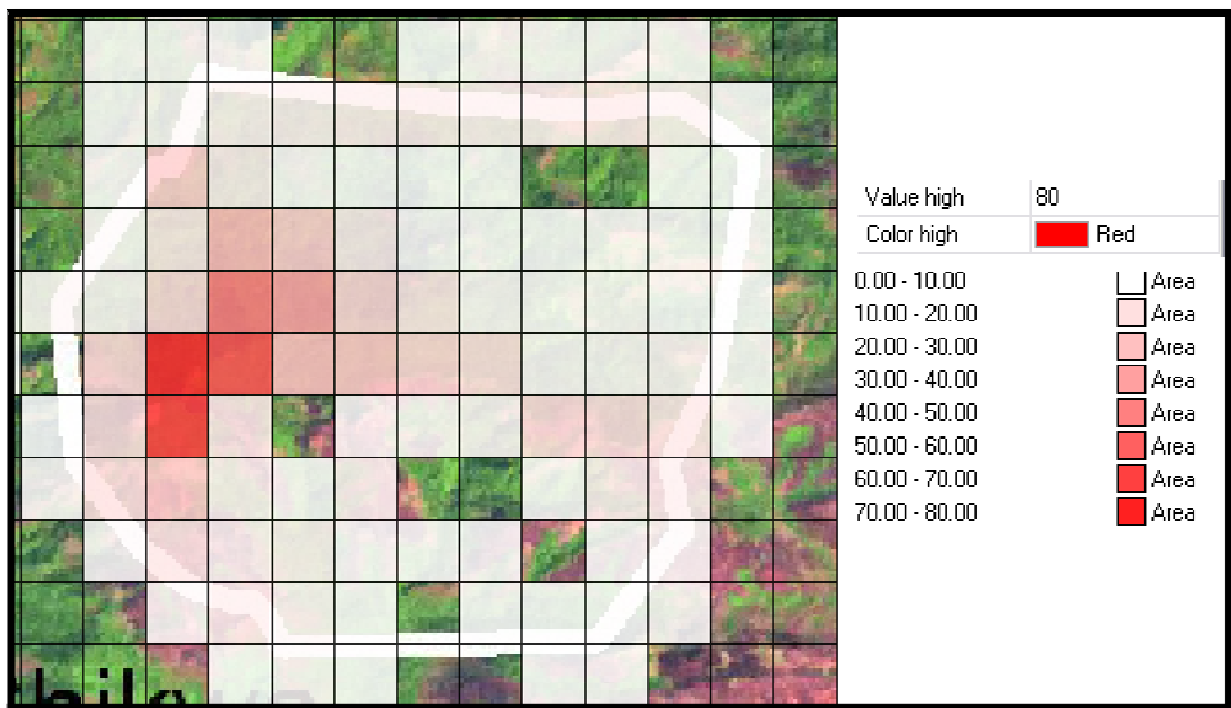
##### *Data analysis*

In the analyses, only results of observations from all fresh and recent sign are presented. The encounter rate of all sign was calculated, expressed as the number of signs recorded per kilometer of patrol. Records of the presence of brush-tailed porcupine paths were very numerous and for that reason were not recorded as this would have slowed down progress of patrolling excessively.

Ninety three days of anti-poaching patrols were carried out in the KGS by MINFOF Ecoguards from July 2011 to June 2012. More than 320.3km were walked at an average of 32.03km each month (range 14.90km to 69.73km. More than 265.49 hours of observation were made (Table 12).

**Table 12:** Parameters of MINFOF anti-poaching, activities in KGS July to June 2012

<b>Month</b>	<b>Number of patrol days</b>	<b>Distance covered (Km)</b>	<b>Time taken (hr)</b>
July	-	-	-
August	10	29.74	20.47
September	-	-	-
October	10	27.36	25.34
November	7	20.99	15.45
December	10	25.41	24.14
January	10	26.79	24.26
February	10	69.73	53.20
March	10	30.16	28.00
April	11	51.38	41.93
May	5	14.90	11.57
June	10	23.84	21.13
<b>Totals</b>	<b>93</b>	<b>320.3</b>	<b>265.49</b>



**Figure 21:** MINFOF grid map of patrol effort for anti-poaching, July 2011 to June 2012.

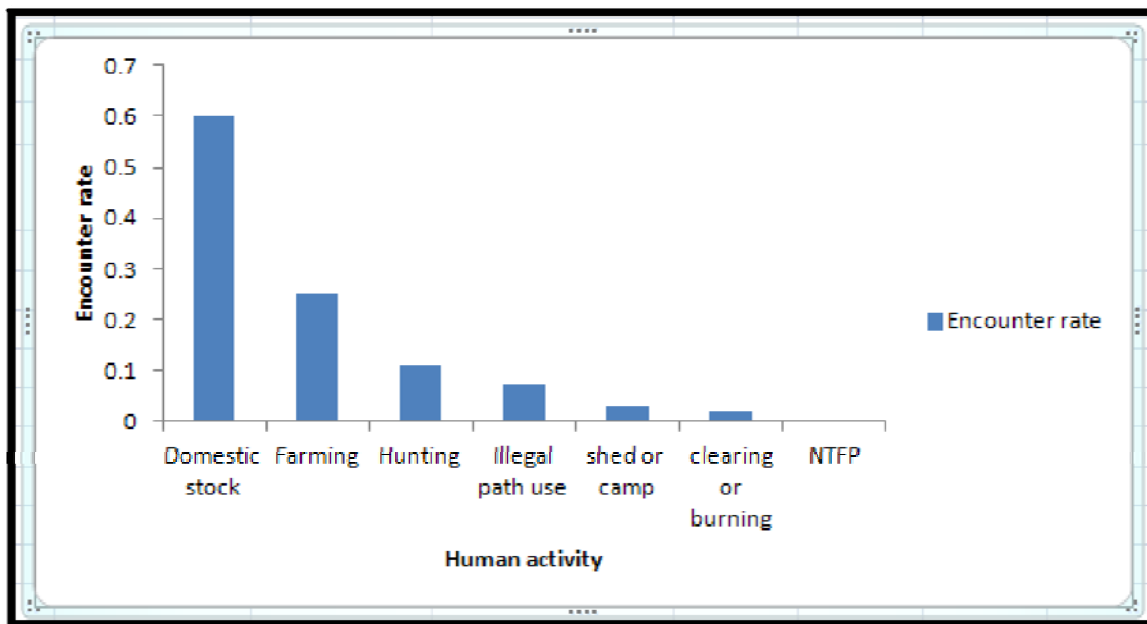
The grid map of patrol effort was created using the patrol effort map in Cybertracker. Each of the 94 grid cells measures 500m x 500m and the distance traveled in each grid cell was measured. During the reporting period, 92.55% (n=87) grids were patrolled as against 72.34% (n=68) of all (94) grids patrolled last year (Figure 21). During this year patrols were concentrated in areas that were identified (Ikfuingei R. 2011) to have more wire snares especially in gorilla-preferred habitat within the sanctuary. There is a need in the next reporting period to further intensify patrols in these areas and other adjacent areas as hunters have been noted to change their tactics when old ones are discovered.

**Table 13:** Frequency of human activity recorded during MINFOF patrols in KGS, July 2011 to June 2012

Month	Farming	Domestic stock	Hunting	Shed or Camp	Clearing or burning	Illegal path use	NTFP
July							
August	11	30	2			1	
September							
October	9	32		4			
November	5	22		3		1	
December	15	14	2		1		
January	4	18	11	1	7	3	
February	12	23	2	1		5	1
March	5	9	7			5	
April	11	21	1	1		7	
May	3	8	4			1	
June	4	14	5			1	
<b>Totals</b>	<b>79</b>	<b>191</b>	<b>34</b>	<b>10</b>	<b>8</b>	<b>24</b>	<b>1</b>

**Table 14:** Encounter rate of human activity during MINFOF patrols in KGS, July 2011 to June 2012.

Month	Farming	Domestic stock	Hunting	Shed or Camp	Clearing or burning	Illegal path use	NTFP
July							
August	0.37	1.48	0.08			0.03	
September							
October	0.33	1.17		0.15			
November	0.24	1.05		0.14		0.05	
December	0.59	0.56	0.08		0.04		
January	0.15	0.67	0.41	0.04	0.26	0.11	
February	0.08	0.16	0.01	0.01		0.03	0.01
March	0.17	0.29	0.23			0.17	
April	0.14	0.27	0.01	0.01		0.09	
May	0.20	0.59	0.27			0.07	
June	0.17	0.59	0.21			0.04	
<b>Encounter rate/km</b>	<b>0.25</b>	<b>0.60</b>	<b>0.11</b>	<b>0.03</b>	<b>0.02</b>	<b>0.07</b>	<b>0.003</b>



**Figure 22:** Average encounter rate of human activity during MINFOF patrol from July 2011 to June 2012.

### *Human pressure*

The encounter rate of fresh and recent human sign recorded by the MINFOF Eco-guard during this reporting period was thankfully low (Table 13 & Table 14). Overall the most common human activities were the presence of domestic stock with an encounter rate of 0.60/km and farming with 0.25/km (Table 14). Domestic animals were mainly found in grassland during this reporting period. As Cross River gorillas are already fragmented in Kagwene, generalist parasites present in overlapping populations especially domesticated animals may pose a more significant threat to the critically endangered Cross River gorillas. During MINFOF anti-poaching patrols it is the mission of the team to seek out human sign and therefore we would expect the encounter rate to be larger on these days.

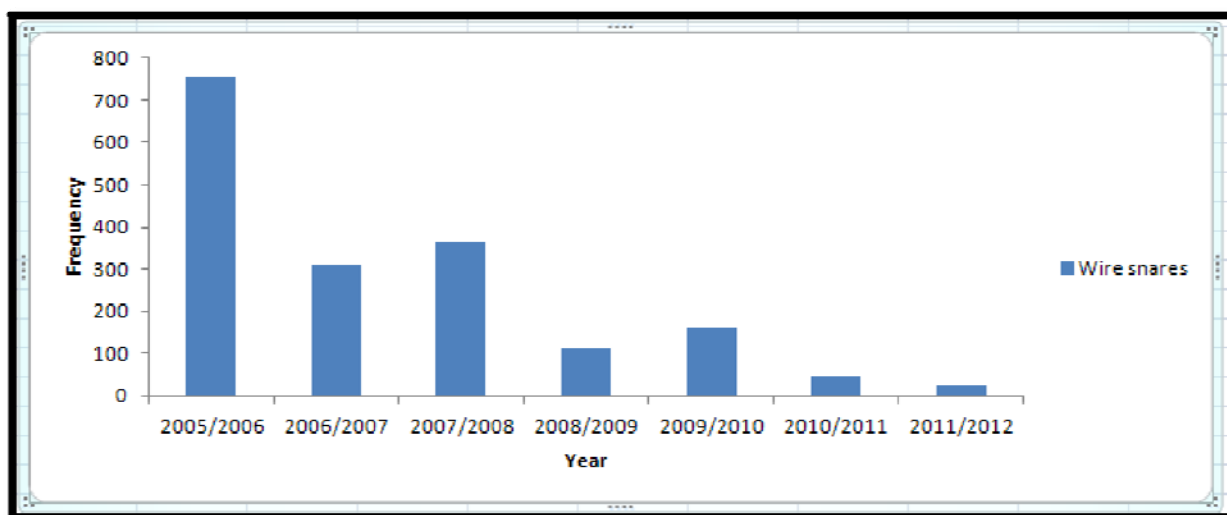
A total of 25 traps (Photo 1) were recorded and removed by the Ecoguards during this reporting season as against 48 recorded during the three months patrolling last year. By constantly working with Tiku Abanda (hunter from Bantakpa village), the patrol team has penetrated more forest areas where old traps have been removed. All wire snares recorded within the sanctuary were removed (Figure 23) and patrols were intensified in areas where wire snares were observed to be concentrated.

The patrol team heard and recorded gun shots on three different occasions within the sanctuary and three used cartridges were also recorded during this reporting period.

Within the sanctuary there were 10 shelters associated with pastoralist activity; these consisted of mud brick buildings with zinc roof shelters for livestock. MINFOF Eco-guards started enforcing wildlife laws by noting the names of all grazers within the sanctuary and issuing verbal warnings

to grazers, poachers and farmers. The KGS Conservator organized a sensitization meeting involving some traditional authorities adjacent the sanctuary and grazers to inform defaulters on the existing prefectorial order banning all grazing, farming, and hunting within the sanctuary. In this meeting it was agreed that by the end of the next dry season, there should be no grazing or farming within the sanctuary.

It is clear that anti-poaching will remain an ongoing focus as hunters change snaring areas in the forest. The MINFOF Ecoguards need to step up their patrolling activities in order to completely control trapping using wire snares in the sanctuary. MINFOF Ecoguards need to continue to sensitize local communities and to apprehend those hunters who do not adhere to the wildlife laws of Cameroon.



**Figure 23:** Wire snares recorded in KGS from 2005 to June 2012 by anti-poaching patrol team.

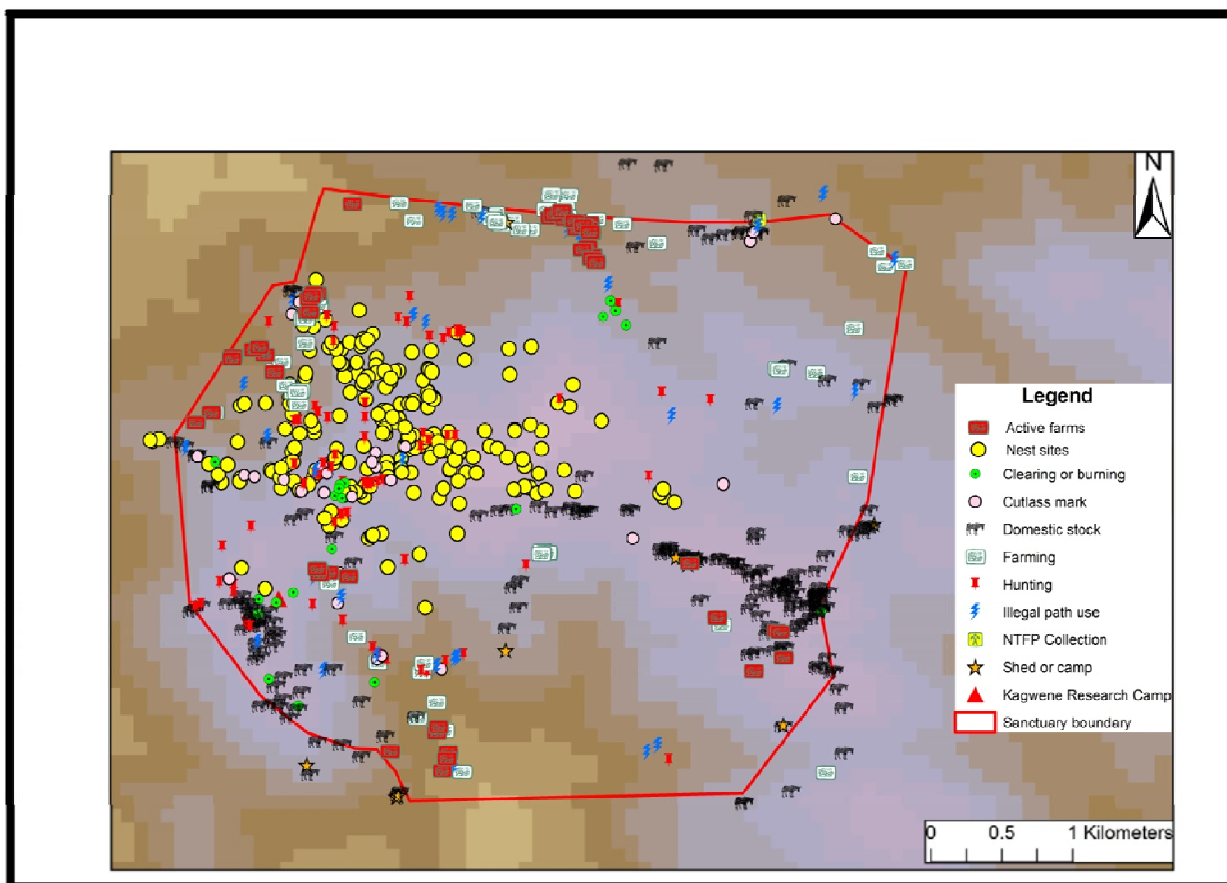
The MINFOF anti-poaching team in the KGS has succeeded in converting a hunter who now use his experience and knowledge of wire snaring in the forest to lead them to parts of the forest where there are wire snares. The continuous presence of MINFOF anti-poaching patrol team in the sanctuary has resulted in the reduction in the number of traps recorded in the sanctuary in the past two years as compared to previous years especially 2005/2006 (Figure 23) when the anti-poaching activity was initiated and carried out by local WCS Kagwene Research camp staff.

The majority of farms recorded during the reporting period were under canopy. The farms were planted with cocoyams, plantain, pepper, and other crops. The people of the area quite often practice shifting cultivation, using a piece of land for 2-3 years and then abandoning it and clearing another area of forest. However, the cocoyam farms that were encountered were all old farms that were being maintained by the farmers. In the grassland the crops are often a spinach-like vegetable. Farmland under canopy is created by piling leaf litter up against tree trunks and burning them in order to encourage the tree to die, as well as, clearing away all shrubs and herbs

at ground level. Farming is degrading the habitat for all wildlife in the sanctuary, reducing the area in which wildlife can range and possibly resulting in contact between wildlife and human waste in either drinking spots or feeding points and could result in disease transmission.

The disturbance caused by farming in the southeast of the sanctuary appears to have driven the gorillas away from this area. This can be clearly seen from the change in nest site localities over the years. The method of farm clearance does not totally devastate the area, there is still canopy and in some places fruiting trees still remain. This bodes well for the reclamation of this area by gorillas once human disturbance is reduced. Very few clearings or burnings were recorded during the reporting period (Figure 24).

Urgently required management measures include the recovery of farmer-encroached forest and grazing areas within the sanctuary. With the delimitation of the sanctuary there is a need for agricultural re-training for the farmers of the area as it is now illegal to farm within the sanctuary.



**Figure 24:** Location of human activity and Cross River gorilla nesting, July 2011 to June 2012.

Grassland is found in the south western and eastern sections of the sanctuary where domestic stock was recorded grazing during this reporting period. Domestic stock was not recorded at the centre of the sanctuary as against last reporting season (Figure 24). MINFOF Ecoguard patrol activities should pay more attention in evicting grazers from within the sanctuary. During this reporting period Cross River gorillas avoided constructing nests in areas where domestic stock and farmland were found but nested in some portions of the sanctuary very closed to wire snares (Figure 25). More illegal paths, traps (wire snares) and farmland were recorded on the Kenchi and Bantakpa sections of the Sanctuary indicating the human pressure especially hunting from those two communities.

*Large mammal species recorded during anti-poaching*

Signs for fifteen large mammal species were recorded (Table 15). Cane rat, rock hyrax, large duikers, medium duikers, and Preuss's monkey were the most commonly recorded species. However, the category of medium duiker undoubtedly includes numerous records of bay duiker presence. Signs for the genet and otter were recorded although they were amongst the most infrequently encountered species (Table 15).

**Table 15:** Frequency of fresh and recent large mammal sign observed during MINFOF Eco-guard anti-poaching activity, July 2011 to June 2012.

Month	Preuss's monkey	Gorilla	Medium duikers	Large duiker	Small duikers	Bush buck	Red river hog	African civet	Palm civet	Otter	Pangolin	Flat headed cusimanse	Rock hyrax	Cane rat	Brush-tailed porcupine
July <sup>1</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
August	4	3	9		1							1	8	17	1
September <sup>2</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
October	5	2	12	14		3	6	4			1		21	63	6
November	3		1	5				1	1			1	5	18	
December	7	5	19	13		2	8					1	17	7	11
January	2	3	27	14	2	2	16	3	4			2	31	12	9
February	6	1	18	4	1		4					1	12	7	4
March	8	5	20	1	1	2	3			1			21	15	3
April	11	5	22	5	4	3	1			1		1	10	6	5
May	2	6	4	3		3	1		1				1	5	3
June	9	3	9	13	5	2		1			1		19	18	3
<b>Totals</b>	<b>57</b>	<b>33</b>	<b>141</b>	<b>72</b>	<b>14</b>	<b>17</b>	<b>39</b>	<b>9</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>7</b>	<b>145</b>	<b>168</b>	<b>45</b>

<sup>1</sup> The MINFOF Eco-guards were attending a military training and no data was collected in July 2012.

<sup>2</sup> The MINFOF Eco-guards were attending a military training and no data was collected in September 2012.

**Table 16:** Encounter rate of fresh and recent large mammal signs observed during MINFOF Eco-guard anti-poaching activity, July 2011 to June 2012

Month	Preuss's monkey	Otter	Medium duiker	Large duiker	Small duiker	Palm civet	Bush buck	African civet	Cane rat	Rock hyrax	Brush-tailed porcupine	Common kusimanse	Red river hog	Gorilla	Pangolin
July <sup>3</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
August	0.13		0.30		0.03				0.57	0.27	0.03	0.03		0.1	
September <sup>4</sup>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
October	0.18		0.44	0.51			0.11	0.15	2.3	0.77	0.22		0.22	0.07	0.04
November	0.14		0.05	0.24		0.05		0.05	0.86	0.24		0.05			
December	0.28		0.75	0.51			0.08		0.28	0.67	0.43	0.04	0.31	0.2	
January	0.07		1.01	0.52	0.07	0.15	0.07	0.11	0.45	1.16	0.34	0.07	0.60	0.11	
February	0.04		0.12	0.03	0.01				0.05	0.08	0.03	0.01	0.03	0.01	
March	0.27	0.03	0.66	0.03	0.03		0.07		0.5	0.70	0.10		0.10	0.17	
April	0.14	0.01	0.28	0.06	0.05		0.03		0.08	0.13	0.06	0.01	0.01	0.06	
May	0.13		0.27	0.20		0.07	0.20		0.33	0.07	0.20		0.07	0.40	
June	0.55		0.38	0.55	0.21		0.08	0.04	0.75	0.80	0.13			0.13	0.04
<b>Totals</b>	<b>0.18</b>	<b>0.01</b>	<b>0.44</b>	<b>0.22</b>	<b>0.04</b>	<b>0.02</b>	<b>0.05</b>	<b>0.03</b>	<b>0.52</b>	<b>0.45</b>	<b>0.14</b>	<b>0.02</b>	<b>0.12</b>	<b>0.10</b>	<b>0.01</b>

<sup>3</sup> The MINFOF Eco-guards were attending a military training and no data was collected in July and September 2012.

<sup>4</sup> The MINFOF Eco-guards were attending a military training and no data was collected in July and September 2012.

## Other outputs

### *KGS as a Training Centre*

#### Gorilla Guardians

A five day refresher course took place from Friday 3<sup>rd</sup> to Monday 7<sup>th</sup> of November 2011 at the KGS Research Camp. The main resource persons were Mr. Sama Liyong Emmanuel (KGS conservator) and Mr. Romanus Ikfuingei (Field Manager for WCS-TMLP). Participants came from all the eight current Gorilla Guardian (GG) communities in the Takamanda-Mone Landscape. The sanctuary and the KGS Research Camp were chosen for this training because it is here that participants would be exposed to real evidence of the Cross River gorillas (CRG) such as fresh feeding trails, footprints, nests, dung and other gorilla activities. More over at the KGS it takes less than one day to make a guided trip to a fresh CRG nest site.

This refresher course was focused on identifying gorilla nest sites, collecting data on nest sites, ecosystem health, and how to keep the forest healthy. The 'Gorilla Guardian Manual' and the Cameroon wildlife law were also reviewed during this refresher course. The Field Manager (Romanus Ikfuingei) covered the following topics during the refresher course : the Gorilla Guardian programme and the role of GGs, what is a Cross River gorilla , the difference primate types found in Cameroon and their protection status, the differences between great apes that live in the South West region of Cameroon, where Cross River gorillas are found in Cameroon and Nigeria, how to differentiate nest site types (CRG, great ape, and chimpanzee (*Pan troglodytes ellioti*)), how to collect reliable information from a hunter, what is good research work, how Gorilla Guardians should behave in the forest, how Gorilla Guardians should manage field camps, what to do in case of an emergency, and finally what to do and what not to do in case of a physical encounter with gorillas.



**Photo 2:** The Conservator explaining Cameroon wildlife laws, November 2011.



**Photo 3:** Gorilla Guardians for training at KGS, November 2011.

### *Newly Selected Gorilla Guardians*

In February 2012 two Gorilla Guardians, Achu Martin from Batambe and Lucas Negbor from Amebishu, were retrained in Kagwene on the Gorilla Guardian protocol and wildlife laws of Cameroon by WCS Field Manager and the Conservator. This training course focused on identifying gorilla night nest sites, collecting data on night nest sites (Photo 5



**Photo 5:** The Gorilla Guardians at a nest site.



**Photo 4:** The Conservator explaining protected wildlife species.

& Photo 4) ecosystem health and how to keep the forest healthy. The ‘Gorilla Guardian Manual’ and the Cameroon wildlife law were introduced to the newly selected Gorilla Guardians.

### *Livelihood improvement training*

Two supervisory visits were carried out by the beekeeping consultant during this reporting period. Each village visit consisted of 2 parts: 1) on-site community beehive inspection, and 2) meeting with beekeepers to discuss recent progress and any problems or issues that might have arisen during the course of the year. It was realized that bees were absconding from the hives due mostly to infestation by ants (Photo 7). These ants are great enemies of the hive. There are all sorts of brown ants, safari ants, soldier ants and a variety of black tree ants that invade the hive and drive the bees away. Some brown ants get into the hive and block the entrance before the bees enter. They make their colony in there and when burned others come after a few days. This problem was identified at Kenchi and Bantapka, while in other communities (Ngwo, Ekaw and Chikwa) spiders were a main problem to the bees as the spiders trap, kill, and eat the bees. The Consultant advised the beekeepers to inspect their hives on weekly basis so as to keep them clean of ants and spiders.



**Photo 7:** Burnt ants in a hive at Bantapka village.



**Photo 7:** Bee farmers harvesting ripe honey at Ngwo.

The communities surrounding the KGS have expressed wonderful support to the bee-keeping programme (Photo 7). Excellent foundations on bee-keeping have been laid in the communities and there is need to provide further assistance. Given that we have basically established interest and capacity in bee-keeping in these communities, the next steps for the programme include the following:

- Training bee-keepers on how to manufacture secondary products like candles, furniture polish, skin ointments, soap, honey drink, propolis tincture, medicine, etc
- Investigate the potential to build on the current subsistence-level honey production through improved marketing strategies and entrepreneurial skills
- Establish a bee-keepers cooperative with filtering equipment to improve the quality of the honey produced
- Organize further training on practical harvesting of honey with bee-keepers
- Continue supervisory follow-up visits to bee-keepers
- Produce practical educational community posters regarding bee-keeping to increase wider uptake
- Organize palm wine tapers into groups and train them on the importance of bees to avoid bee-losses

## ***Visitors***

### *Working Dogs for Conservation*

In December 2011, a collaborating research team from Working Dogs for Conservation (Dr Megan Parker, Executive Director, Aimee Hurt, Associate Director, Dr Ngaio Richards, Canine Field Specialist), North Carolina Zoological Park (Dr Richard Bergl)

and Emory University and Rollins School of Public Health (Dr Thomas Gillespie, Associate Professor of Global Health and Biodiversity Conservation) visited the KGS and collected fecal samples of Cross River gorillas to analyze for genetic material and disease. This will help us to better conserve the species.

#### *USFWS*

In February 2012, Dirk Byler and Matt Muir from the USFWS visited the Kagwene Gorilla Sanctuary. While at the sanctuary the bio-monitoring team led them to some Cross River gorilla fresh night nest sites.

#### *D.O Njikwa*

In March 2012, the Divisional Officer for Njikwa sub division, Mr Ndifor John Nico, together with the 1<sup>st</sup> Assistant Brigade Commander-Njikwa (Pandong Georges), The Sub Delegate of Agriculture and Rural Development (Mr Mbah Lucas) and the Secretary General for Njikwa Council (Mr Nsoh Ndebi) visited the Sanctuary. At the end of the visit the D.O commented that “More has to be done to keep away illegal farmers and grazers within the sanctuary and around the buffer zones. It is a place to be”.

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