

## **Annex 5**

### **Database and GIS with existing and new biological data**

- Data collection report of existing and new biological data**
- Maiko existing monitoring data (before FY07)**

# Data collection report of existing and new biological data

## Maiko NP, FY 07

ICCN Maiko National Park staff together with WCS and DFGFI gathered research and monitoring data over the past few years. The existing GPS data was processed separately by either DFGFI or WCS.

Unfortunately the WCS data is not yet integrated into the DFGFI data base, nor is the newest data of Maiko NP patrols. Maiko National Park will hire one new staff for Monitoring and Research in FY 08 to assure the compilation of all the existing data for integration into the Maiko data base and the processing and visualization through the DFGFI GIS unit.

The updated biological data on gorillas and chimpanzees as far as already integrated into the GIS data base (DFGFI) is shown as Figure 1 and 2 in context with the newest data of the UGADEC Nature Reserves and CBNRM zone (corridor creation).

Figure 1: Gorilla distribution (WCS data and MNP FY 07 data not yet integrated)

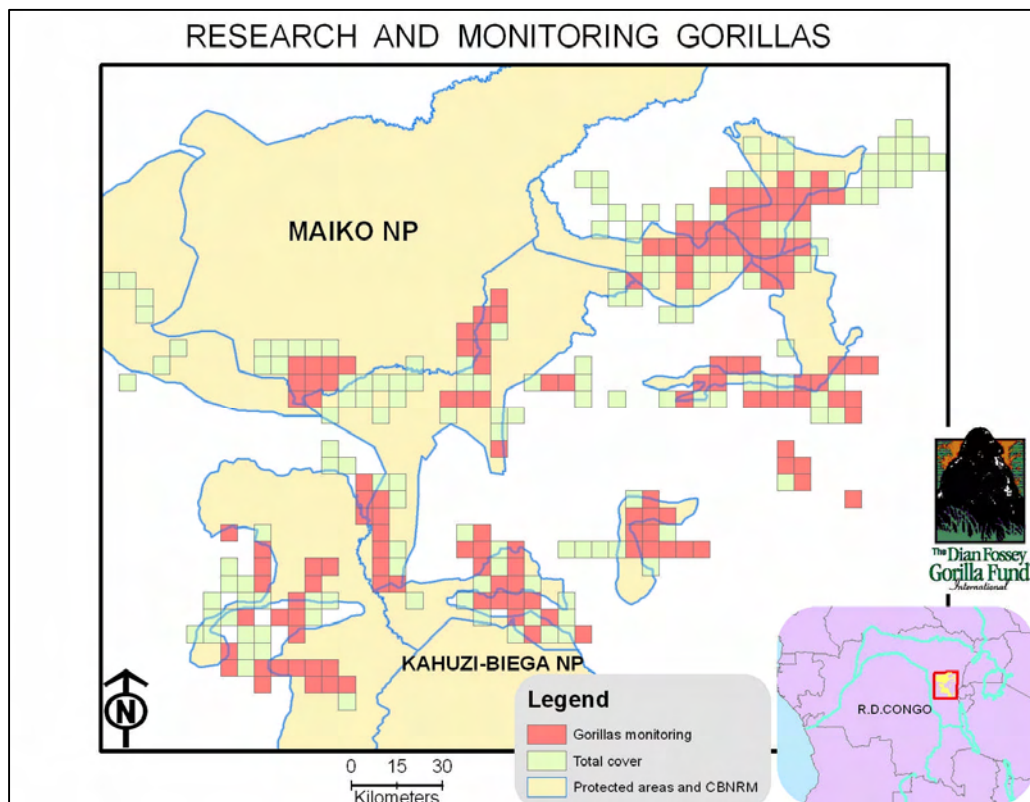
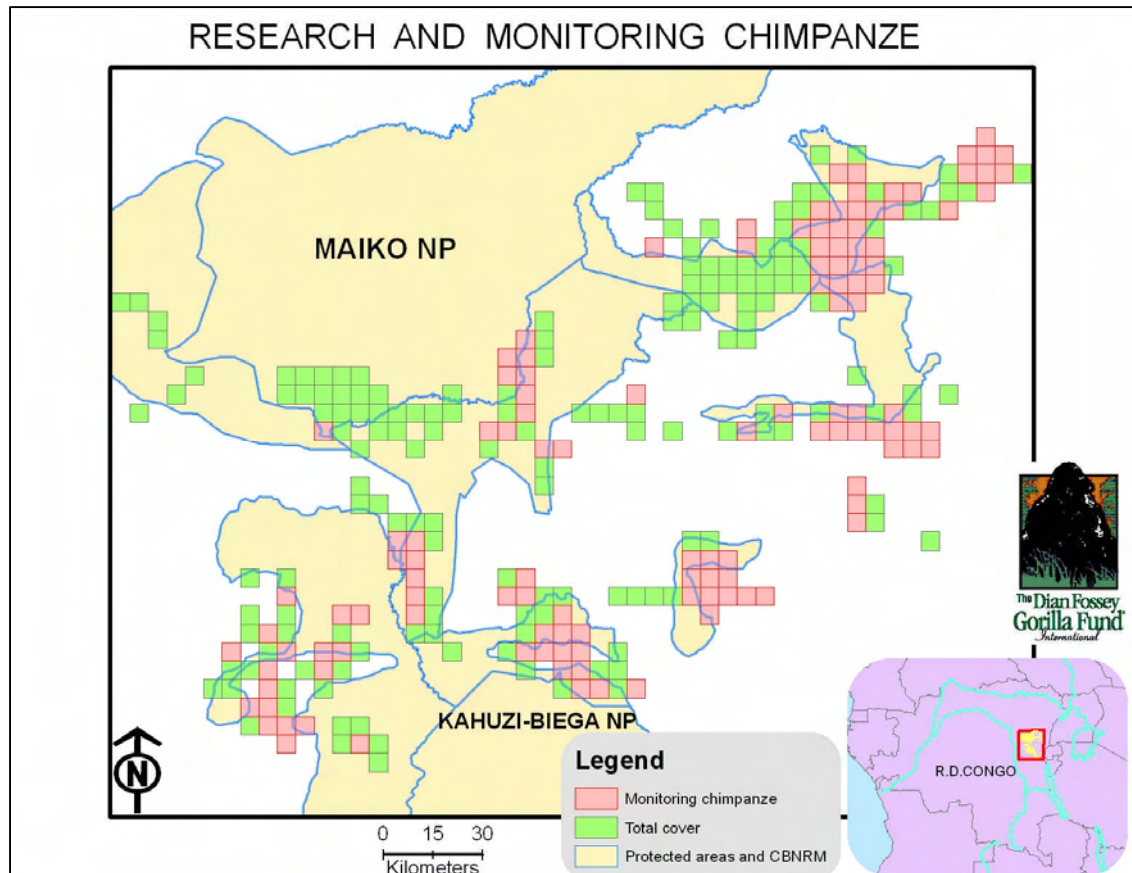


Figure 2: Chimpanzee distribution (WCS data and MNP FY 07 data not yet integrated)



The following pages are a compilation of maps that show the existing research and monitoring data from the past that need still to be integrated into one Maiko NP data base and need to be compiled and visualized by the DFGFI GIS unit.

## Gorillas

We found gorilla sign on all recce walks and prospection surveys. Details of sign observations and nest site encounter rates for all sign are presented in table 5. Gorilla trail sign (feeding site, dung and tracks) was encountered infrequently over an area 875 km<sup>2</sup> within MNP (figure 9). The mean nest site encounter rate for MNP was 0.07 nest sites/km. We also encountered gorilla nests and/or dung west of park boundaries in the vicinity of Obokola, Okoku and Mundo and south of the Kisangani-Bukavu road near the confluence of the Lowa & Oso Rivers. Areas roughly corresponding to two of the four populations identified by Emlen and Schaller (1960) were still found to contain gorillas and we can confirm the continued presence of gorillas in the Ufia valley (Hart & Sikubwabo 1994). The highest group sign encounter rates were found in the Ndjula, Molefu and Okungu regions. The lowest sign encounter rates (all solitary males) were found in the Ufia and Oso-Obokaya regions. High levels of gorilla activity were also observed outside of park boundaries in the Mundo and Ntufia regions. A total of 22 fresh and recent nest sites were encountered throughout the survey region (MNP n=12, Adjacent forests n=10). Overall mean nest group size was 6.2 (range = 1-15, SD=4.5).

Only 1 direct sighting of a solitary male gorilla (Ufia west region) was made during the survey although gorillas were heard on 3 separate occasions. During the survey we also received reliable reports from senior MNP guards and local hunters that additional gorilla populations exist within and adjacent to MNP and although we were unable to confirm these reports during this survey, they indicate that the occupancy area for Grauer's gorilla in the Maiko south region is probably larger than identified by this preliminary study.

**Table Gorilla observations and nest site encounter rates**

Survey area	Sighting	Call	Trail sign	Sign counted			Nest sites/km
				Dung	Nest sites	Nests (indiv.)	
<b>Maiko NP</b>							
Oso-Obokaya	-	-	0	1	0	0	-
Ndjula	-	-	10	17	5	19	<b>0.15</b>
Ufia west	1	-	2	2	1	1	<b>0.05</b>
Ufia east	-	-	0	1	1	1	<b>0.02</b>
Oseya-Moelfu	-	1	9	6	2	9	<b>0.1</b>
Bitule-Okungo	-	-	10	8	3	19	<b>0.09</b>
<b>Adjacent forests</b>							
Obokola	-	-	2	1	1	1	
Okoku	-	-	4	2	0	0	-
Mundo	-	1	8	1	4	22	-
Ntufia-Lowa	-	1	14	5	5	49	-
<b>Total</b>	<b>1</b>	<b>3</b>	<b>59</b>	<b>44</b>	<b>22</b>	<b>121</b>	<b>*0.07</b>

*\*Mean nest site encounter rate for MNP survey quadrats only*



Figure Gorilla distribution in the Maiko south region.

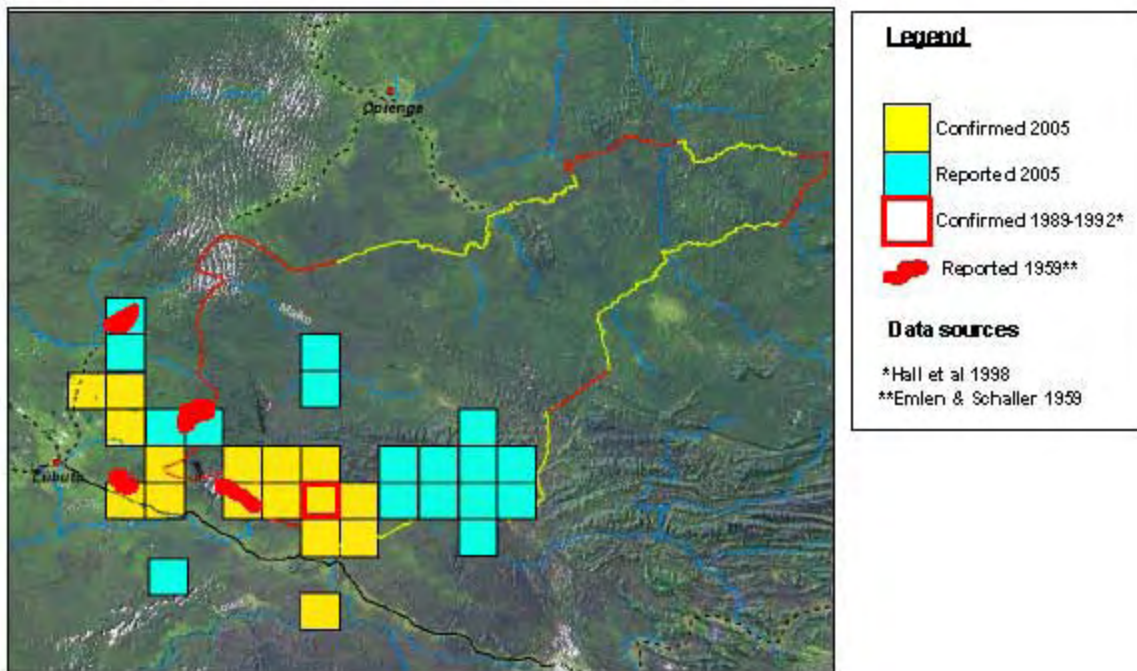
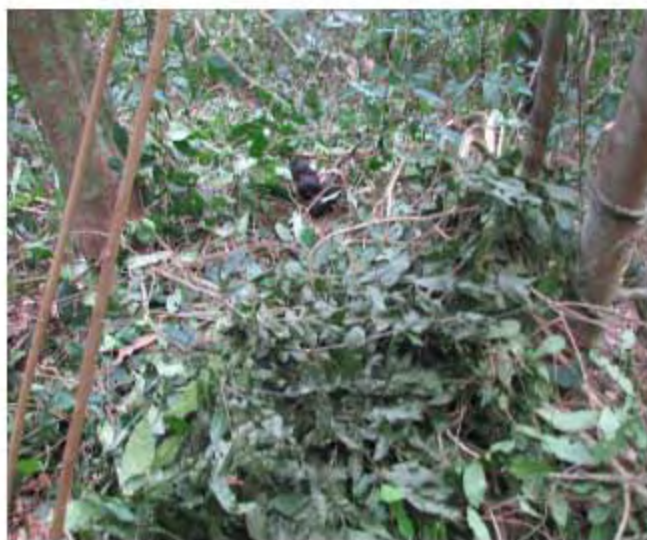


Figure Photographic evidence



A) Gorilla dung in the Ndjula region



B) Fresh gorilla nest site on Mt. Molefu.

### Chimpanzees

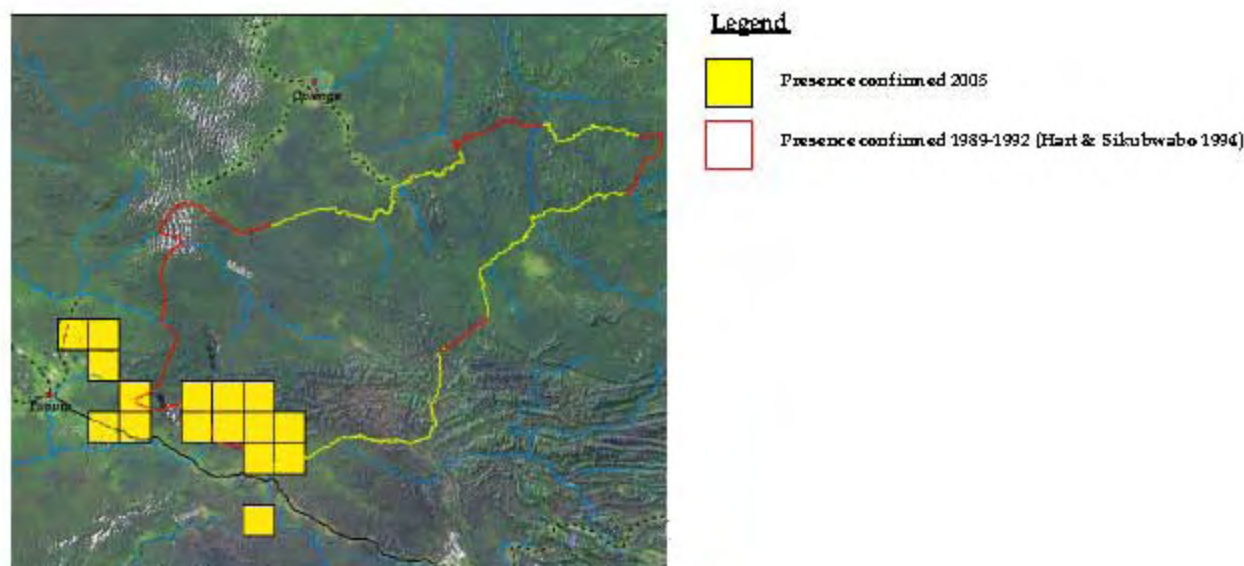
Chimpanzee sign was widespread and encountered in all survey quadrats entered. Details of chimpanzee trail, nest site observations and encounter rates are presented in table 5. In total we observed 24 nest sites throughout the region (MNP n= 12, adjacent forests n=12). The overall number of nest sites encountered rate within MNP is identical to that of gorillas (0.07 nest sites/km). Mean nest group size from all survey areas combined was 3 individuals (range 1-6, SD=1.5.) Highest nest encounter rates were in the Oso-Obokaya and Osey-Moelfu regions. High densities of sign were observed outside of park boundaries in the Ntufia-Lowa and Mundo survey regions and nests and trail sign were observed on opportunistic foot surveys in the Obokola and Okoku regions. No nest sites were observed in the Ufia east and west survey regions. Chimpanzees were seen twice during our survey and heard on 5 occasions.

**Table Chimpanzee observations and encounter rates**

Survey area	Sighting	Call	Sign counted				Nests (indiv.)	Nest sites/km
			Trail sign	Dung	Nest sites			
<b>Maiko NP</b>								
Oso-Obokaya	-	-	4	1	3	8	0.14	
Ndjuia	-	3	3	1	1	1	0.03	
Ufia west	-	-	3	-	-	-	-	
Ufia east	-	-	-	1	-	-	-	
Osey-Moelfu	-	-	6	1	4	11	0.19	
Bitule-Okungo	-	-	4	2	4	5	0.09	
<b>Total</b>	<b>0</b>	<b>4</b>	<b>20</b>	<b>6</b>	<b>12</b>	<b>25</b>	<b>0.07</b>	
<b>Adjacent forests</b>								
Obokola	-	-	2	1	2	5	-	
Okoku	-	2	0	-	-	-	-	
Mundo	-	1	4	1	3	5	-	
Ntufia-Lowa	1	2	5	3	7	12	-	
<b>Total</b>	<b>1</b>	<b>5</b>	<b>11</b>	<b>5</b>	<b>12</b>	<b>22</b>	<b>*0.07</b>	

*\*Mean nest site encounter rate for MNP survey quadrats only*

**Figure Chimpanzee distribution**





## Elephants

Elephant sign was encountered in only 3 survey quadrats within MNP and was completely absent in all adjacent forest quadrats. The overall encounter rate for all recent elephant sign was 0.07/km (n=14) and accounted for only 2.4% of all faunal observations. Encounter rate for dung piles only was 0.016/km (n=3). Evidence of elephant poaching was observed in MNP in the Okungu region where 4 carcasses killed within the past 12 months were observed. Ancient evidence of elephant poaching was also confirmed in the Ntufia region where an elephant molar was found at an abandoned hunting camp. Our results indicate a decline in elephant occupancy range over the last 14 years with at least 3 of the survey quadrats first entered by Hart and Sikubwabo (1994) now being extirpated of elephants

**Table** Elephant observations and encounter rates

Survey area	Dung	Sign counted			*Sign/km
		Track	Rub mark	Carcass	
<b>Maiko NP</b>					
Ndjula	3	7	2	-	0.34
Bitule-Okungu	1	1	-	3	0.06
<b>Adjacent forests</b>					
Ntufia-Lowa	-	-	-	1	-
<b>Total</b>	<b>4</b>	<b>8</b>	<b>2</b>	<b>4</b>	<b>0.08</b>

\* Active sign only

**Figure** Elephant distribution in the Maiko south survey region:

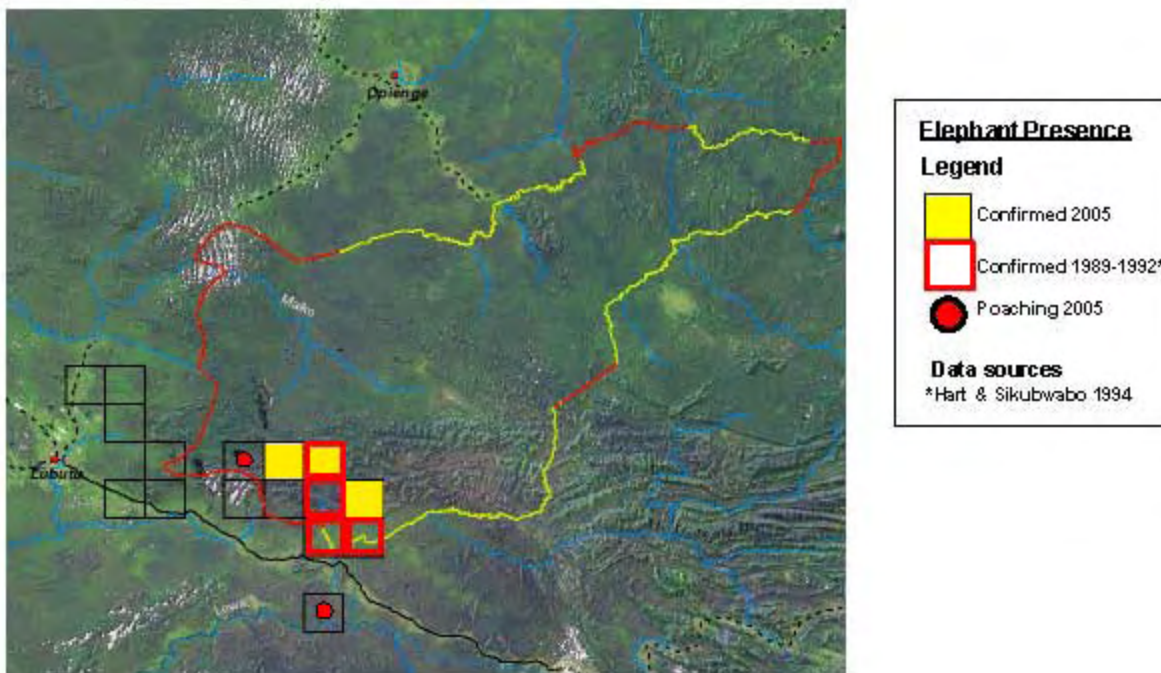
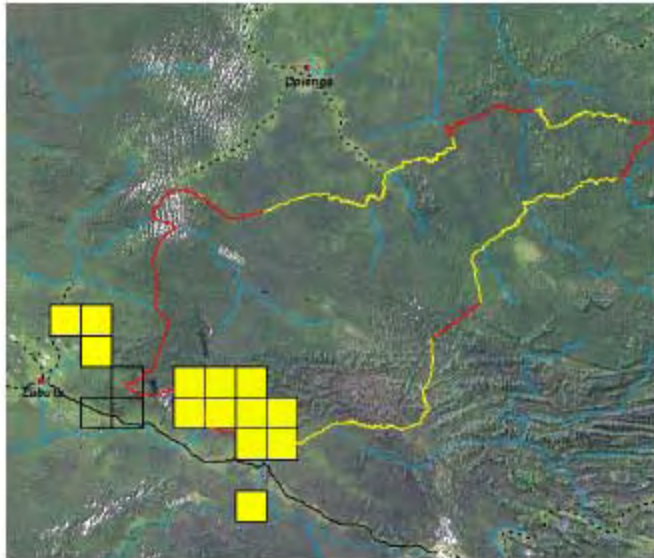


Figure Red river hog Distribution



**Legend**

- Presence confirmed 2005
- Presence confirmed 1989-1992 (Hart & Sikubwabo 1994)

Figure Okapi Distribution

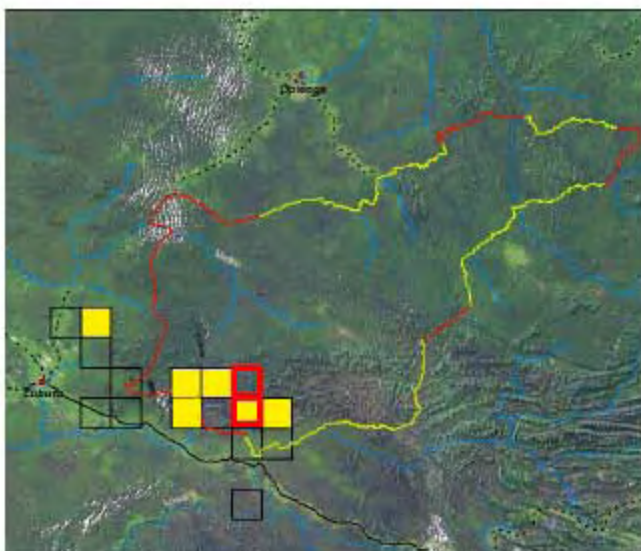


Table Red river hog observations & encounter rates

Survey area	Sign counted			Sign/km
	Dung	Track	Feed	
<b>Maiko NP</b>				
Oso-Obokaya	-	2	1	0.14
Ndjula	3	5	6	0.43
Ufia east	1	5	-	0.29
Ufia west	-	1	-	0.03
Osey-a-Moelfu	2	8	4	0.69
Bitule-Okungu	-	6	2	0.22
<b>Adjacent forests</b>				
Mundo	-	3	-	-
Ntufia-Lowa	-	2	-	-
<b>Total</b>	<b>6</b>	<b>27</b>	<b>13</b>	<b>*0.29</b>

\* Mean encounter rate for MNP quadrats only.

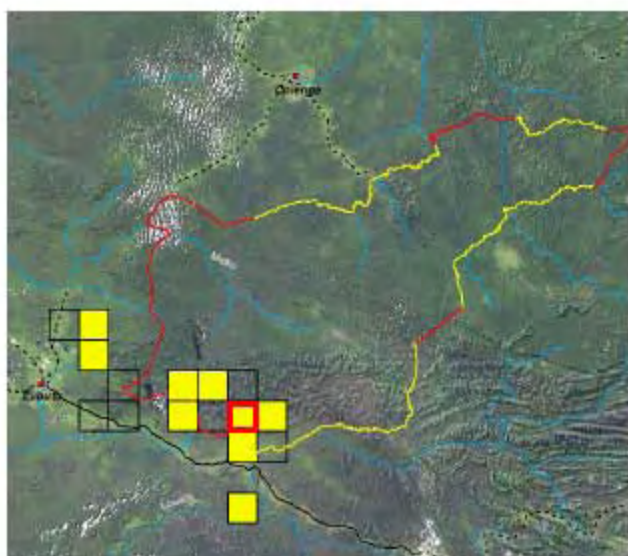
Table Okapi observations & encounter rates

Survey area	Sign counted			Sign/km
	Dung	Track	Browse	
<b>Maiko NP</b>				
Ndjula	4	9	3	0.49
Ufia east	0	1	-	0.02
Osey-a-Moelfu	1	1	-	0.05
Bitule-Okungu	1	4	-	0.14
<b>Adjacent forests</b>				
Mundo	2	3	-	-
<b>Total</b>	<b>8</b>	<b>18</b>	<b>3</b>	<b>*0.14</b>

\* Mean encounter rate for MNP quadrats only.



Figure Buffalo distribution



**Legend**

- Presence confirmed 2005
- Presence confirmed 1983-1992 (Hart & Sikubwabo 1994)

Figure Sitatunga distribution

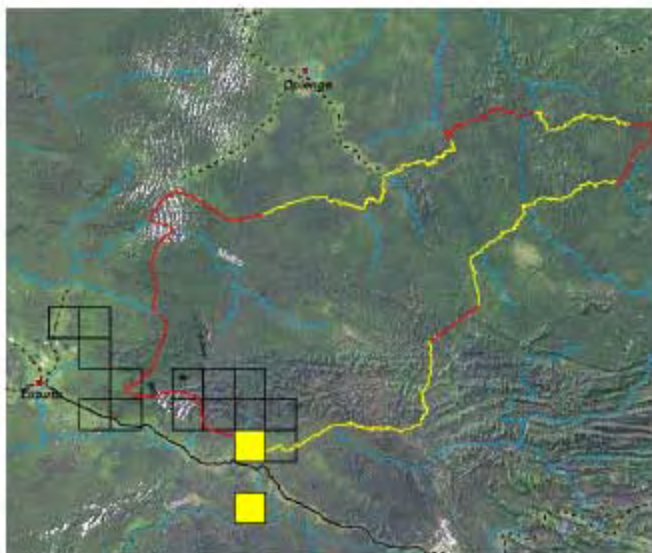


Table Buffalo observations & encounter rates

Survey area	Dung	Sign counted		Sign/km
		Track	Feed	
<b>Maiko NP</b>				
Oso-Obokaya	-	2	-	0.09
Ndjula	1	3	-	0.12
Ufia east	2	2	-	0.19
Ufia west	-	-	-	-
Osey a-Moelfu	-	2	2	0.19
Bitule-Okungu	-	1	-	0.03
<b>Adjacent forests</b>				
Mundo	-	1	-	-
Ntufia-Lowa	-	5	-	-
<b>Total</b>	<b>3</b>	<b>10</b>	<b>2</b>	<b>*0.08</b>

\* Mean encounter rate for MNP quadrats only.

Table Sitatunga observations & encounter rates

Survey area	Dung	Sign counted		*Sign/km
		Track	Browse	
<b>Maiko NP</b>				
Oso-Obakaya	1	1	0	0.05
<b>Adjacent forests</b>				
Ntufia-Lowa	-	1	-	-
<b>Total</b>	<b>1</b>	<b>2</b>		<b>0.05</b>

\* Mean encounter rate for MNP quadrats only.

### Leopard

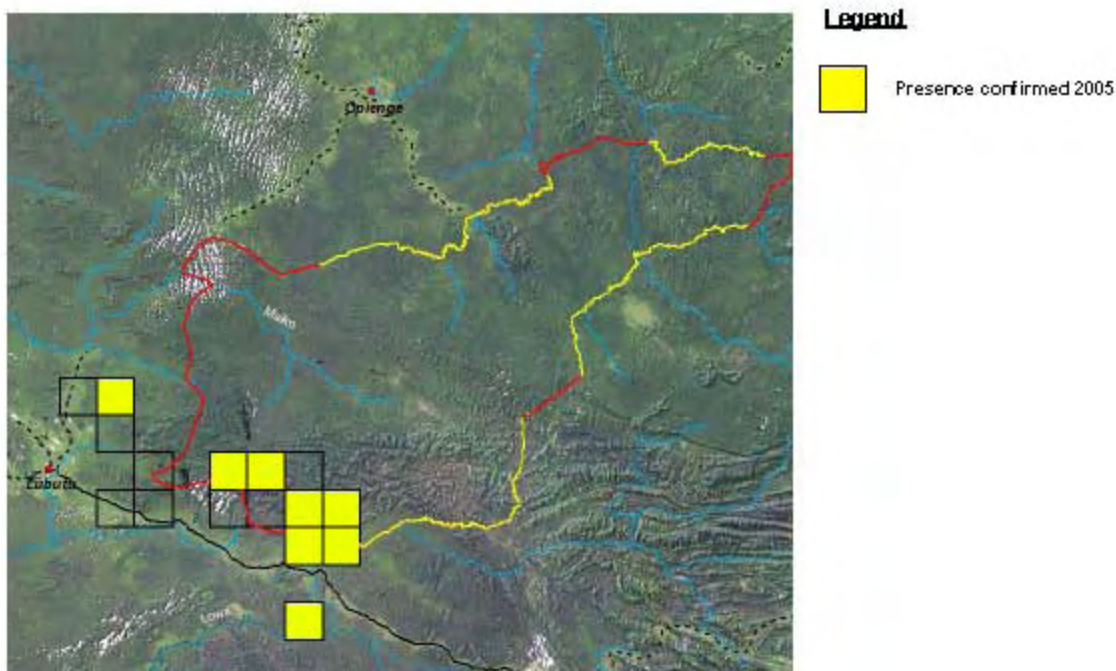
Leopard presence was identified within five of 6 six-survey regions within MNP. No leopard sign was encountered on 20 km of recce path walked in the Ufia west region. The mean encounter rate for all sign within MNP was 0.14 sign/km. Presence of leopard was also confirmed in one survey quadrat in the Mundo region and in one quadrat the Ntufia-Lowa survey area. Throughout the survey region leopard presence was most frequently identified by tracks (74% of all observations) although diurnal leopard calls were heard and a recent kill site (duiker) observed in the Oseya-Moelfu region.

**Table** Leopards trail observations and encounter rates

Survey Area	Track	Sign counted			*Sign/km
		Scat	Kill	Call	
<b>Maiko NP</b>					
Oso-Obokaya	3	-	-	-	0.14
Ndjuia	6	1	-	-	0.21
Ufia east	1	1			0.09
Oseya-Moelfu	2	1	1	1	0.24
Bitule-Okungu	1	-	-	-	0.03
<b>Adjacent forests</b>					
Mundo	1	-			-
Ntufia-Lowa	-	-			-
<b>Total</b>	<b>14</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>*0.14</b>

\* Mean encounter rate for MNP quadrats only.

**Figure** Leopard Distribution



**Congo peafowl**

The MNP was created in part to protect the endemic Congo peafowl (*Afrapavo Congensis*) and we were able to identify the presence of this bird by nocturnal call and feeding sign in four survey quadrats.

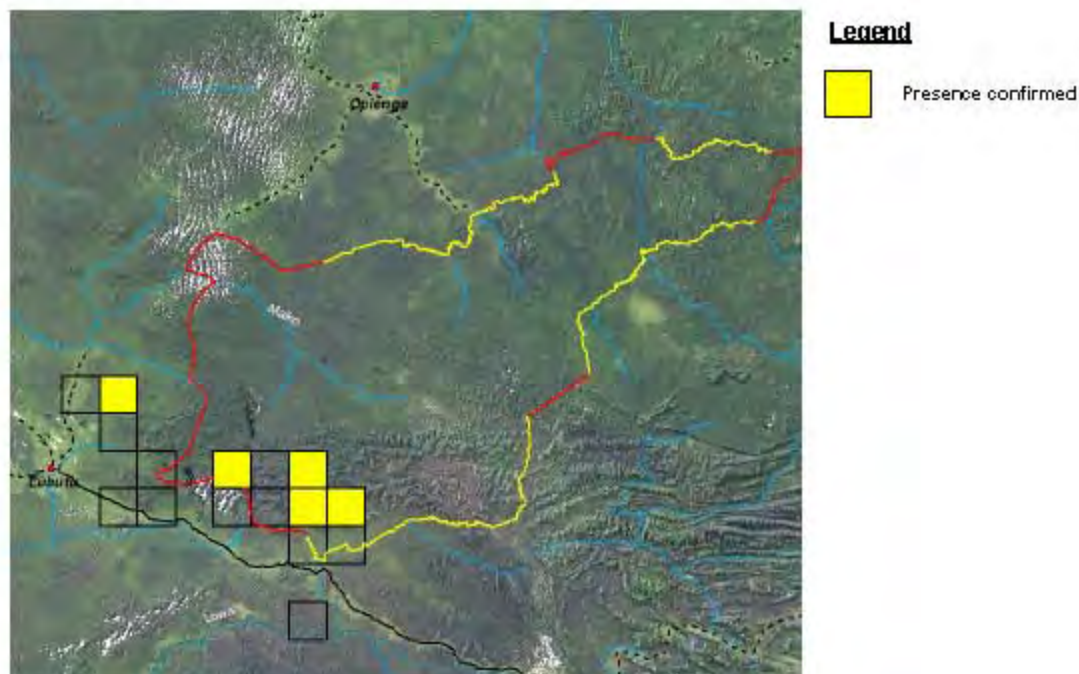
Highest encounter rates were in the Ndjula (0.25 sign/km) and the Oseya-Moelfu (0.19 sign /km) regions respectively. We also confirmed the presence of this bird in the Mundo region to the west of MNP.

**Table 13. Peafowl observations and encounter rates**

Survey Area	Call	Sign counted	
		Feed	*Sign/km
<b>Maiko NP</b>			
Ndjula	6	2	0.25
Ufia west	1	-	0.03
Oseya-Moelfu	2	1	0.19
Bitule-Okungu	4	2	0.17
<b>Adjacent forests</b>			
Mundo	2	0	-
<b>Total</b>	<b>15</b>	<b>5</b>	<b>*0.12</b>

*\*Mean encounter rate for MNP survey quadrats only*

**Figure 14. Peafowl Distribution**





## Human activity

Evidence of human activity was recorded in all survey quadrats within and adjacent to park boundaries. Table summarises the frequency of human activity encountered within MNP and presents composite encounter rates. The overall encounter rate for human sign was 0.93 sign/km. Human sign was encountered most frequently in the Oseya-Moelfu (1.92 sign/km) and west of the Ufia river (1.83 sign/km) a major access route into the forest. Machete cuts on trees marking pathways were observed on all survey routes (total for MNP = 211) but due to their high frequency are not included in encounter rate calculations for human sign. The most frequently encountered human activity was the presence of small temporary camps used as shelter for hunters and/or miners. All camps encountered had been used within the last 12 months.

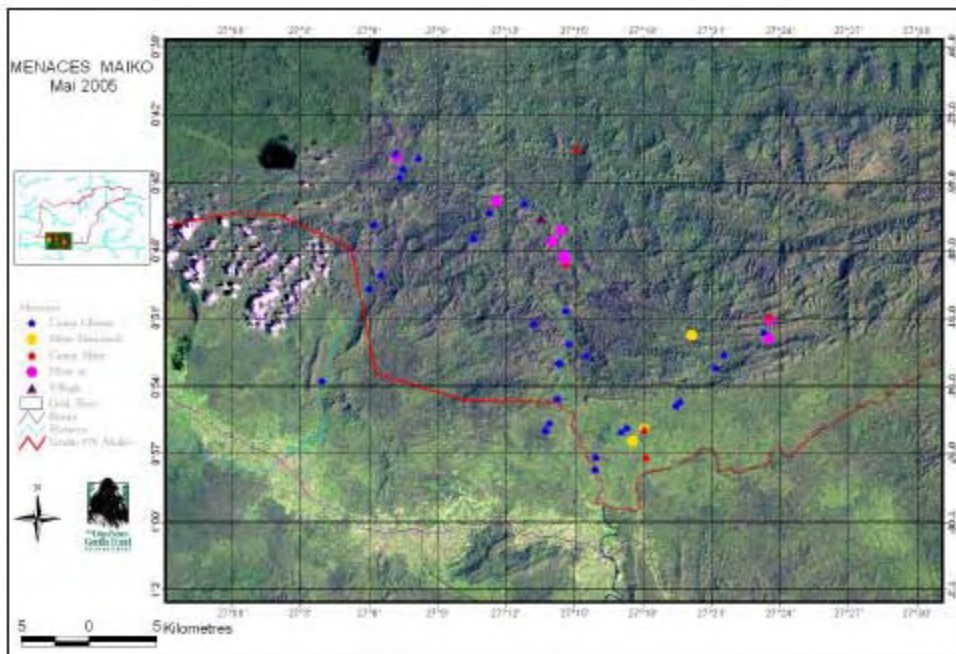
**Table Observation Frequencies and Encounter Rates for Human activities within MNP**

Survey area	Sign counted						Sign/km	
	Mine	Trap/ Snare	Camp	Village	*Hunting	Ivory poaching		
Oso-Obokaya	4	3	4	1	2	-	2	0.76
Ndjuia	4	2	5	-	1	-	-	0.33
Ufia west	1	7	8	-	13	-	8	1.83
Ufia east	1	3	11	-	2	-	-	0.64
Oseya-Mt. Moelfu	11	3	11	1	4	-	9	1.92
Bitule -Okungu	2	2	3	-	1	5	-	0.33
<b>Total</b>	<b>23</b>	<b>20</b>	<b>42</b>	<b>2</b>	<b>21</b>	<b>5</b>	<b>19</b>	<b>**0.93</b>

\* Includes shotgun cartridge and bullet casings

\*\* Mean sign/km

**Figure Recorded Sign of Human Disturbance within MNP. \***



\*Blue indicates hunting camps; yellow, diamond mines; red, mining camps; purple, gold mines, triangle, small permanent Simba village. The two "trails" of hunting camps to the west follow the Ufia river valley, and are major access routes into and from the Park

TABLE Recce catalog for three field teams in the Oso Bloc,.

TEAMID	No Recce	Start Date	Stop Date	Observateur1	Observateur2
Eq1	RV O22	24-Apr-06	26-Apr-06	Boniface Nyembo	Yuma Gbogboto
Eq1	RV O22B	26-Apr-06	26-Apr-06	Boniface Nyembo	Yuma Gbogboto
Eq1	RV Q20	30-Apr-06	30-Apr-06	Boniface Nyembo	Yuma Gbogboto
Eq2	RV Q22	20-Apr-06	22-Apr-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV Q22B	22-Apr-06	23-Apr-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV O20	30-Apr-06	2-May-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV O20B	2-May-06	2-May-06	Chryso Vyahavwa	Batwayonga Mombe
Eq3	RV R23	16-Apr-06	21-Apr-06	Crispin Kibambe	Asango Lisingahindo
Eq3	RV P21	25-Apr-06	26-Apr-06	Crispin Kibambe	Asango Lisingahindo
Eq3	RV N21	3-May-06	4-May-06	Crispin Kibambe	Asango Lisingahindo
Eq3	RV L25	28-Mar-06	28-Mar-06	Crispin Kibambe	Asango Lisingaindo
Eq3	RV L24	29-Mar-06	29-Mar-06	Crispin Kibambe	Asango Lisingaindo
Eq3	RV L23	29-Mar-06	30-Mar-06	Crispin Kibambe	Asango Lisingaindo
Eq3	RV M23	30-Mar-06	31-Mar-06	Crispin Kibambe	Asango Lisingaindo
Eq3	RV M24	31-Mar-06	1-Apr-06	Crispin Kibambe	Asango Lisingaindo
Eq3	RV M24B	1-Apr-06	2-Apr-06	Crispin Kibambe	Asango Lisingaindo
Eq2	RV N25	28-Mar-06	30-Mar-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV O25	30-Mar-06	30-Mar-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV P24	30-Mar-06	31-Mar-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV P23	31-Mar-06	1-Apr-06	Chryso Vyahavwa	Batwayonga Mombe
Eq2	RV P23B	1-Apr-06	3-Apr-06	Chryso Vyahavwa	Batwayonga Mombe
Eq1	RV M25	28-Mar-06	29-Mar-06	Boni Nyembo	Yuma Gbogboto
Eq1	RV N24	29-Mar-06	30-Mar-06	Boni Nyembo	Yuma Gbogboto
Eq1	RV N23	30-Mar-06	31-Mar-06	Boni Nyembo	Yuma Gbogboto
Eq1	RV O23	31-Mar-06	1-Apr-06	Boni Nyembo	Yuma Gbogboto
Eq1	RV O24	1-Apr-06	2-Apr-06	Boni Nyembo	Yuma Gbogboto
Eq1	RV O24B	2-Apr-06	2-Apr-06	Boni Nyembo	Yuma Gbogboto

TABLE . Summary data on survey coverage for the Oso Block.

Teams	No of data points	Number of photos	Number of basemap points	Total number of Faunal Observations	Number of Human sign observations	Number of centroids
3	1,945	1,408	171	905	555	31

Number of circuits	Total km	Recce length		Elevation			
		average	Median	Low	High	Range	Range/recce
5	301.239	3.20	4.00	1121.36	562.4819	684.9508	96.0356



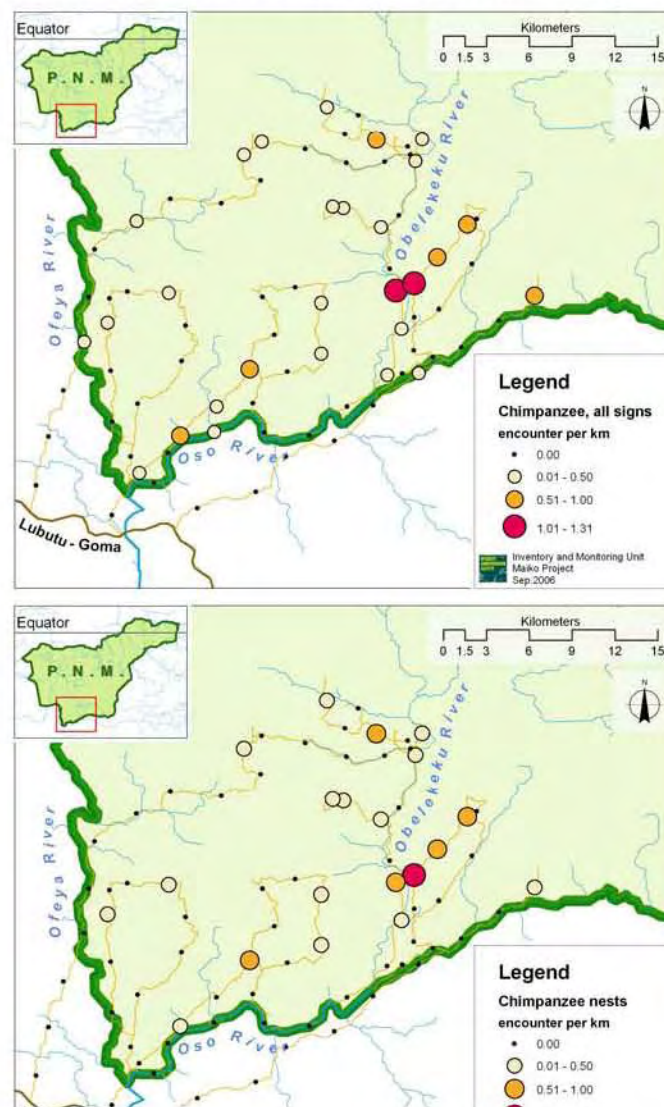
## Gorilla and Chimpanzee

Both species of great apes occur in the Oso Block. Some evidence (such as feeding remains) could not always be attributed to one of the species with certainty. Observations of great apes included:

Species	Nest groups	Calls	Dung	Tracks	Feeding
Chimpanzee	32	1	10	5	46
Grauer's gorilla	3	1	8	10	

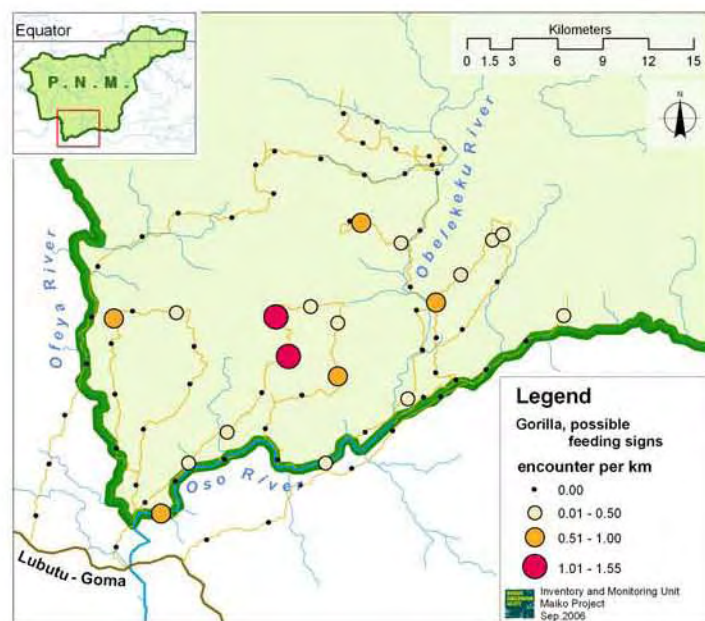
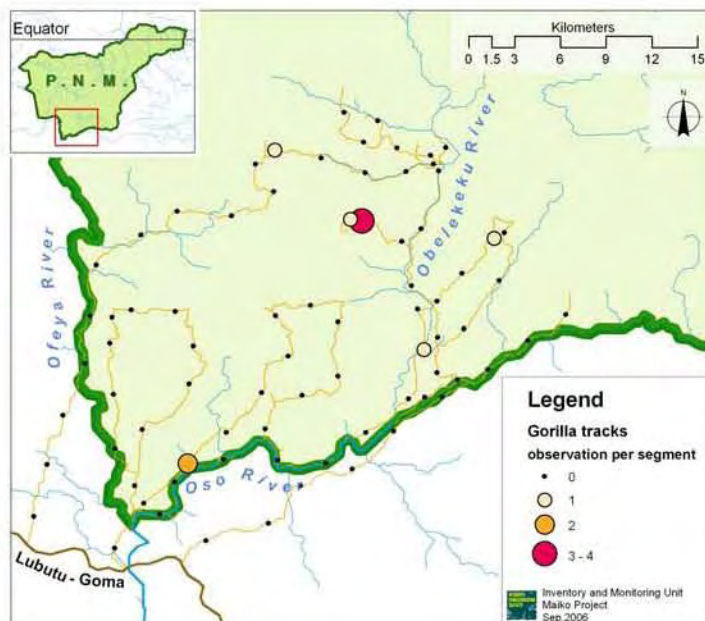
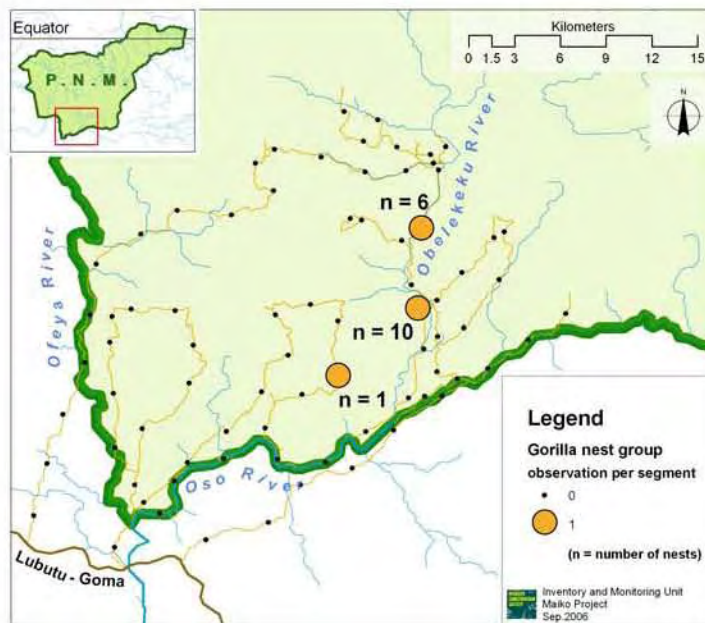
The following points summarize the status of great apes in the Oso Block:

- Chimpanzees: Common.** Based on nest group encounters, a standard index of occurrence, chimpanzee are widespread throughout the block, though numbers appear to be low at most locations. Highest numbers were found in the Obelekeku watershed in the east of the block. But chimpanzees also used the heavily hunted forests near Lubutu in the west of the block.
- Gorillas: Low numbers and localized.** Nesting sites and fresh tracks are the most reliable indicator for gorilla occurrence. The survey indicates that gorillas have a limited distribution in the block and may be restricted to only a few groups, and solitary animals. Most records are in the Obelekeku River area. Both tracks and feeding remains indicate that one group of gorillas may occur in the west of the block near the Ofeya-Oso confluence. This area is close to the Kisangani-Goma road. Further follow-up by the ICCN guards is recommended.

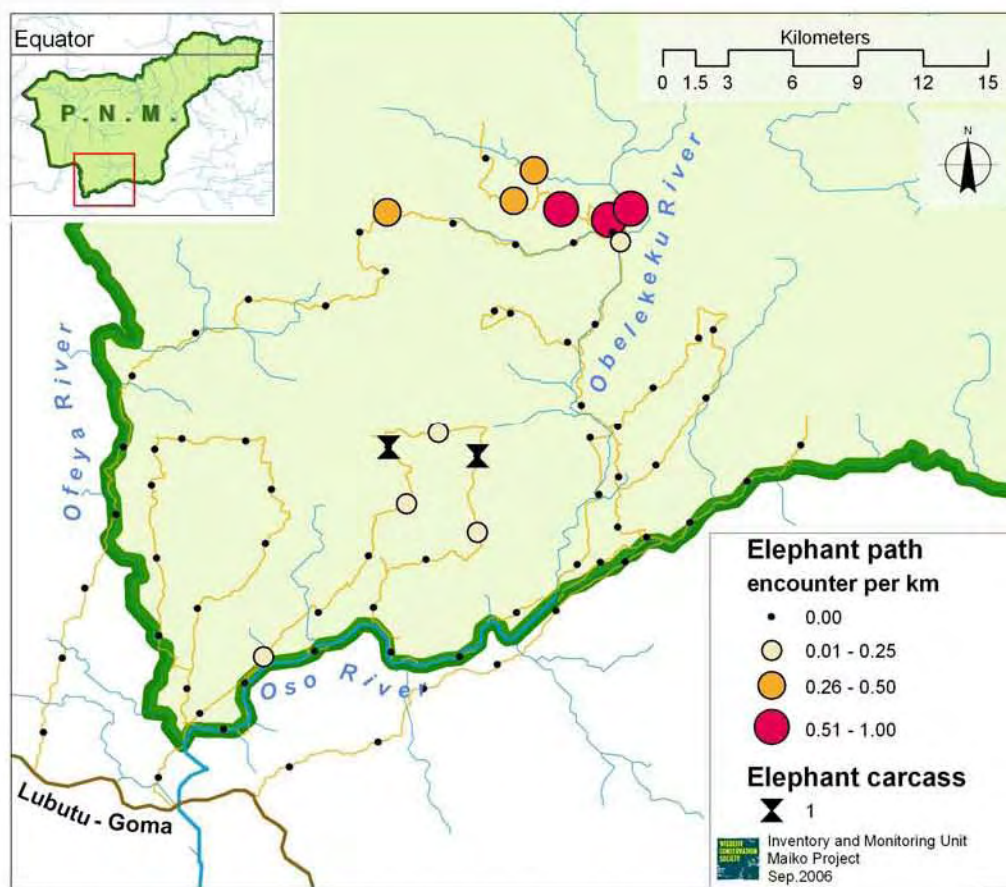
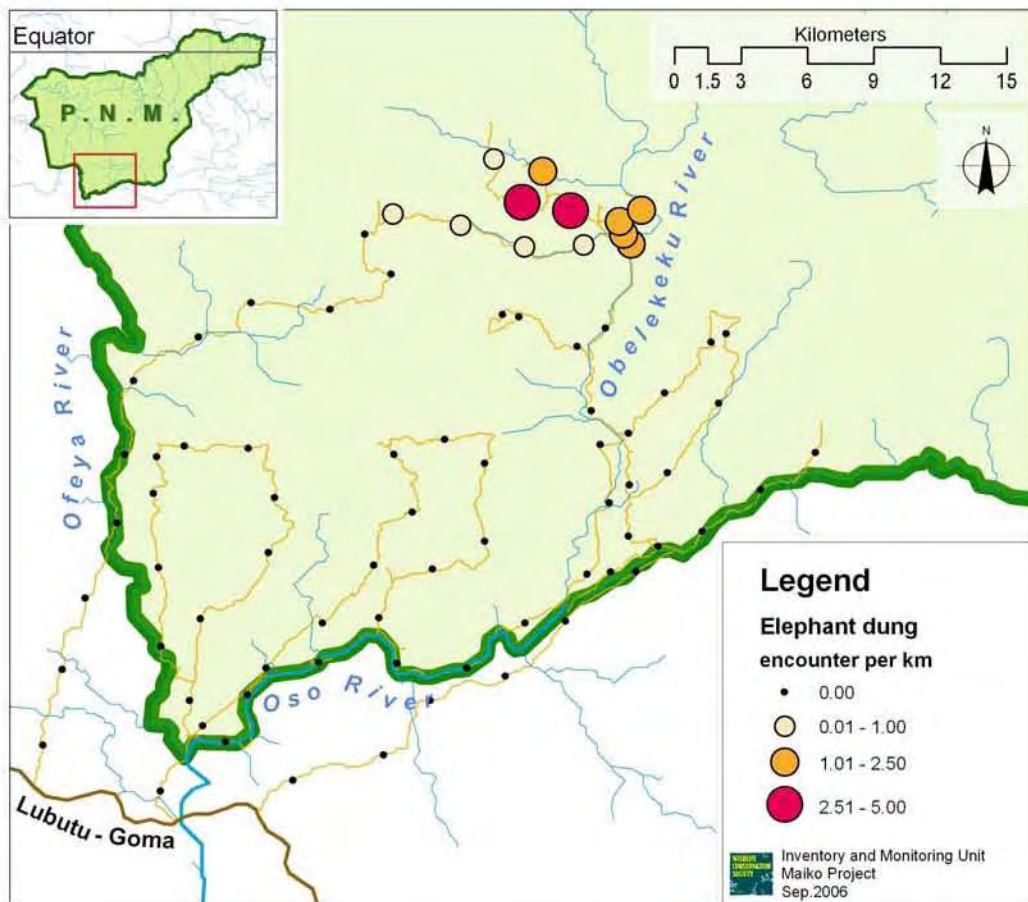


**FIGURE** Evidence of Chimpanzee in the Oso Block



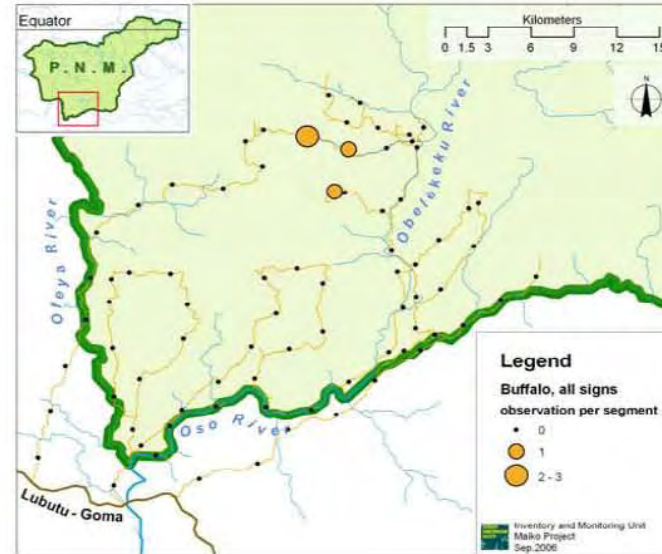
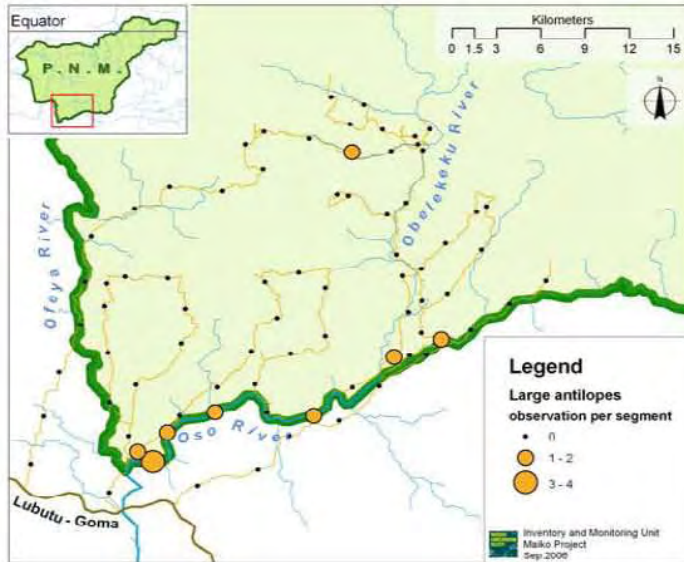


**FIGURE** Evidence of Gorilla in the Oso Block Feeding remains of chimpanzees and gorillas could be confused, occurrence of each species must be confirmed by additional evidence.

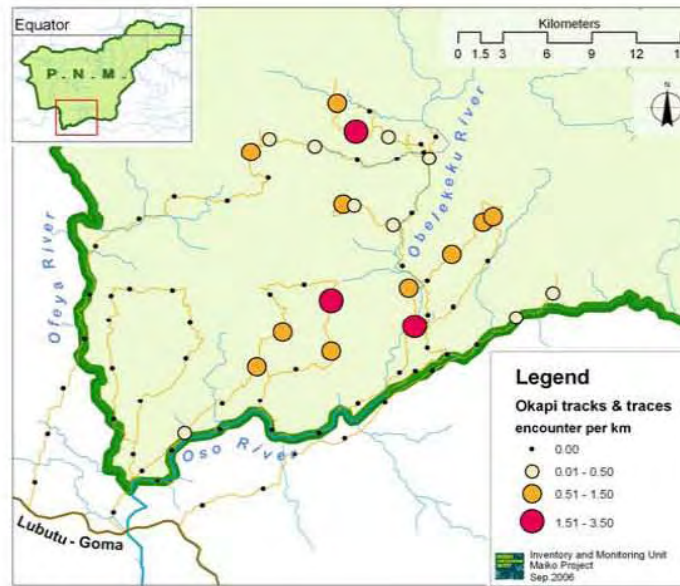
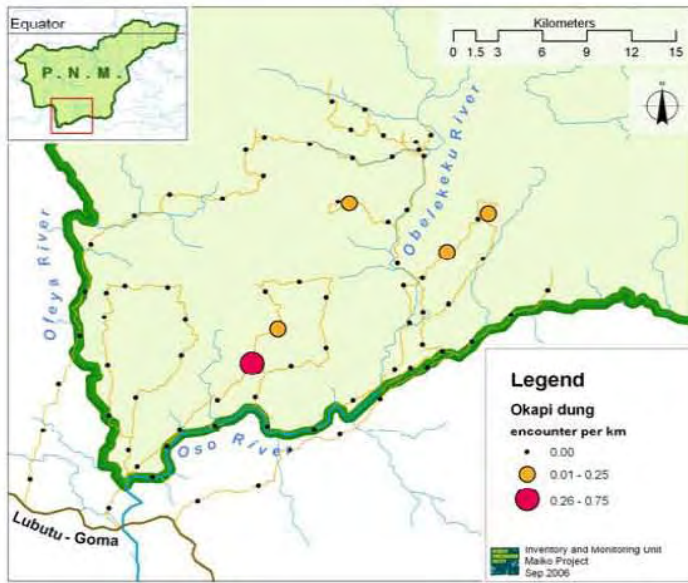


**FIGURE** Evidence of elephant in the Oso Block



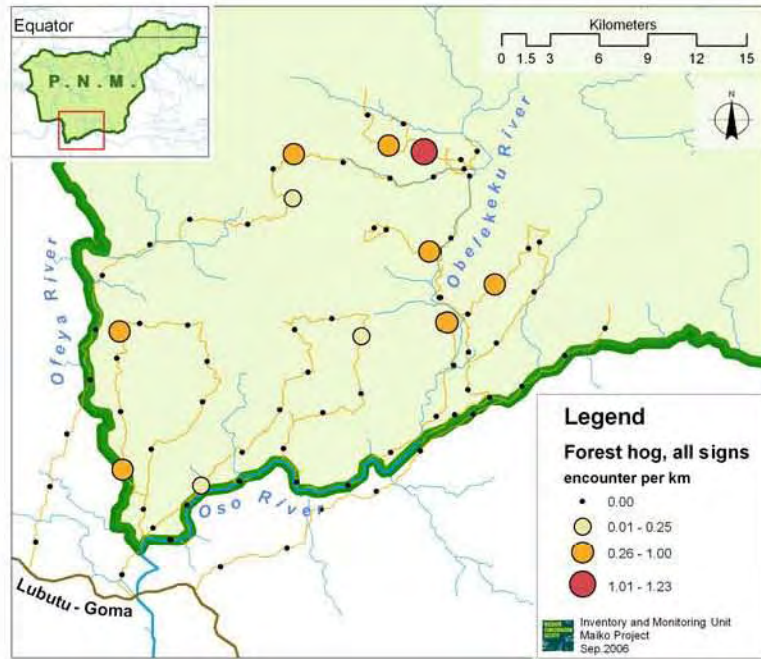
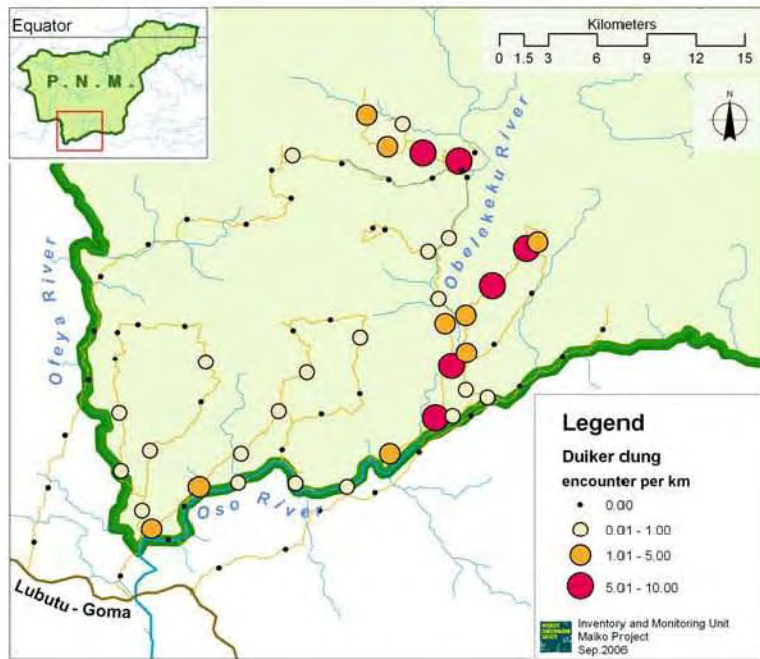


**FIGURE** Occurrence of Bongo and Sitatunga (left) and buffalo in the Oso Block

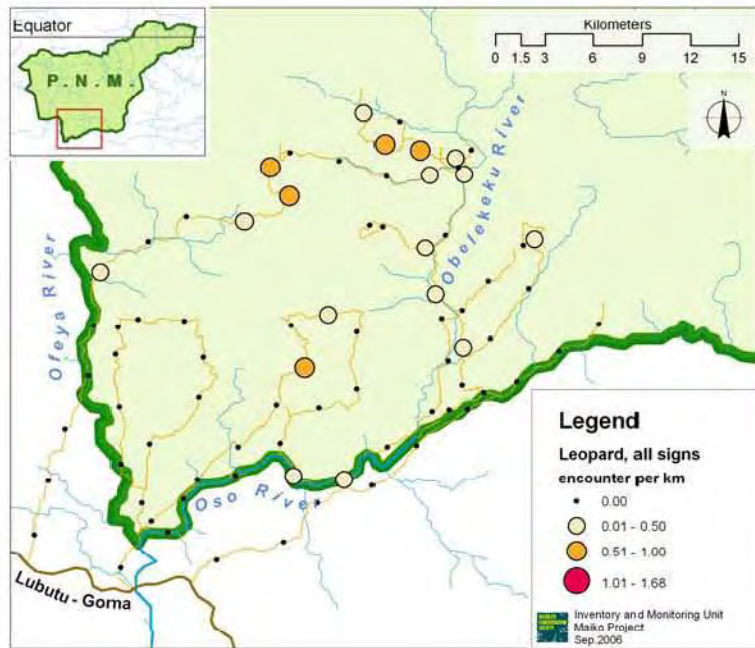
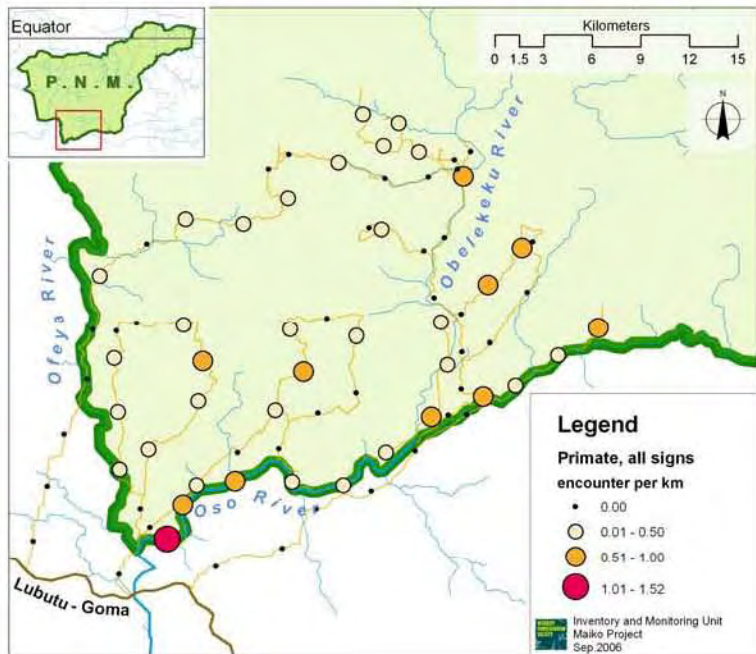


**FIGURE** Evidence for okapi in the Oso Block: including dung counts, feeding sign and recent tracks.





**FIGURE** Evidence of duikers (left) and Red river hog (right) in the Oso Block:.



**FIGURE** Evidence of primates (left) and leopard (right) in the Oso Block: including dung counts, urine marks and recent tracks.