

Trade in Orphans and Bushmeat Threatens One of The Democratic Republic of the Congo's Most Important Populations of Eastern Chimpanzees (*Pan troglodytes schweinfurthii*)

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Abstract: Following the invasion of the Bili-Uéré Domaine de Chasse by illegal gold miners in June 2007 and the subsequent abandonment of a long-term community conservation and research project there, the first author conducted a survey of chimpanzees and other large mammals on the south side of the Uele River, in the forests around the cities of Buta, Aketi, and Bambesa. This survey confirmed the presence of a large population of chimpanzees (*Pan troglodytes schweinfurthii*) in these forests, consistent with findings from surveys north of the Uele between 2004 and 2007. We also documented an expansion of the bushmeat trade to the south of the Uele River, linked to the artisanal diamond and gold mining industries and centered on Buta. Over an 18-month period from September 2007 to March 2009, we observed 42 chimpanzee orphans and 34 chimpanzee carcasses in markets, houses, and by the roadsides. This encounter rate of orphans and carcasses to the south of the Uele River was 20-30 times higher than that of the Bili area to the north. Interviews with local villagers and hunters indicate that there has been a major increase in bushmeat hunting, and the hunting of chimpanzees in particular, over the past 15 years. This wave of killing is currently expanding rapidly across the region. Given that the northern Democratic Republic of the Congo is home to one of the largest continuous populations of chimpanzees remaining in Africa, it is crucial that this region be accorded the highest conservation priority. We recommend four lines of intervention to respond to this major and urgent threat: 1) Bring an end to the slaughter, 2) Establish formal protection for key chimpanzee populations and their habitats, 3) Begin educational campaigns via films and radio, and 4) Ensure the care of existing orphans.

Key words: *Pan troglodytes schweinfurthii*, orphans, bushmeat crisis, The Democratic Republic of the Congo, artisanal mining, Bili-Uéré Domaine de Chasse

Résumé: Après l'invasion du domaine de chasse Bili-Uéré par les exploitants illégaux d'or en juin 2007, le premier auteur a mené un recensement de chimpanzés (*Pan troglodytes schweinfurthii*) et autres grands mammifères au sud de la Rivière Uele, où nous avons trouvé une grande population des chimpanzés, comme existe aussi au nord. D'après notre documentation, nous assistons à une recrudescence énorme de commerce de la viande de brousse, liée à l'expansion récente d'exploitation artisanale de l'or et diamants dans la région de Buta. Pendant une période de 18 mois, de septembre 2007 jusqu'à mars 2009, nous avons dénombré 42 orphelins chimpanzés et 34 cadavres des chimpanzés mise en vente comme bush meat. Le taux de rencontre des orphelins et carcasses est de 20-30 fois plus élevé que le taux de rencontre constant à Bili, au nord de la Rivière Uele. D'après les informants locaux cette phénomène date des dernières 15 années. Étant donné que la région abrite une des plus grande populations de chimpanzés Afrique, il est urgent que l'on accordera une plus grande priorité à la conservation. Nous recommandons quatre lignes d'intervention comme réponse à cette menace: 1) Mettre fin à ce massacre, 2) Établir la protection formelle pour les populations clés des chimpanzés et pour leurs habitats, 3) Commencer des campagnes d'éducation utilisant des films et la radio, et 4) Assurer le soin des orphelins existants.

INTRODUCTION

History of the project

It has been estimated that the forests of the northern Democratic Republic of the Congo (DRC) are home to about half of the remaining free-living chimpanzees (*Pan troglodytes*) in Africa (Butynski, 2001). With chimpanzee populations declining across the continent (Walsh *et al.*, 2003; Campbell *et al.*, 2008), the protection of DRC's large population is of vital importance for the survival of the species.

In 2004, Hicks (TH) began a five-year chimpanzee study, based initially in the Bili Forest but then moving west into the Gangu Forest. The Bili-Gangu region is located to the northwest of the town of Bili and is included in the forest-savanna ecotone of the Bili-Uéré Domaine de Chasse (Figure 1). Notable fauna in the Bili-Gangu Forest includes forest elephants (*Loxodonta cyclotis*), lions (*Panthera leo*), eight species of monkey (see Hicks, in prep.), as well as a major population of chimpanzees (*Pan troglodytes schweinfurthii*).

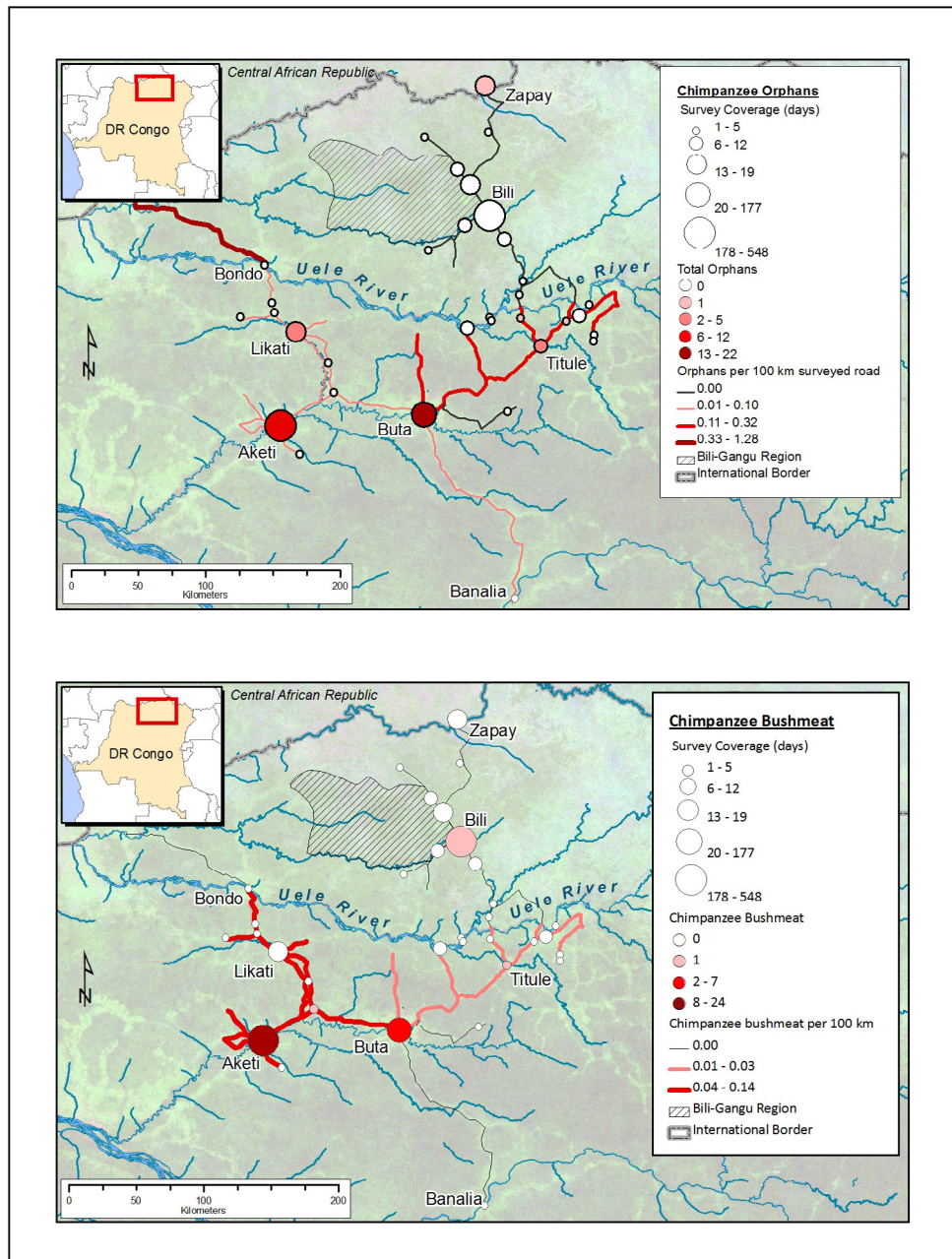


Figure 1. The study area in the northern DR Congo showing the localities where we encountered chimpanzee bushmeat and orphans. The map includes both confirmed and unconfirmed cases of orphans and bushmeat (see text for the distinction between these cases).

When first encountered in 2005, the Gangu chimpanzees showed surprisingly little fear of humans, correlated with a near complete absence of human use of the area, which is an indication of negligible hunting pressure in the past (Hicks in prep). Over the following five years, TH was joined by Swinkels (JS) and later by Darby (LD). The research was tied closely to a community-based coffee-buying project, initiated in 2002 by the Wasmoeth Wildlife Foundation and conservationist Karl Ammann to encourage support for the conservation of the Bili-Gangu Forest by communities living around its periphery.

In June 2007, the local Azande chiefs broke their agreement with Wasmoeth by opening illegal gold mining sites within the Domaine de Chasse. Within a few months, an estimated 3,000 artisanal miners had installed themselves inside the Reserve near Ngbabo and Mapomboli, within approximately 60 km of Camp Gangu. In September 2007, Wasmoeth Wildlife Foundation field staff left Bili, and access to the site became difficult for researchers. Local informants reported an upsurge in bushmeat in the nearby mining town of Adama, and in 2008 we received reports of chimpanzee orphans being kept at Bili.

Unable to continue our collaboration with the Bili chiefs, we moved south of the Uele River to conduct surveys for chimpanzees and other large mammals, based around the cities of Aketi, Buta, and Bambesa (Figure 1). Between September 2007 and March 2009, in addition to these forest surveys, we counted chimpanzee orphans and bushmeat as we encountered them in South Uele cities, towns, and villages.

The survey regions

The study regions to the north and south of the Uele River differed in many factors: climate, habitat, flora, fauna, and human population density (Hicks, in prep.). The North Uele landscape is a mosaic habitat of primary forest, gallery forest, savanna, and savanna woodland, with a markedly seasonal pattern of rainfall. The human population density is low. South of the Uele the forest is more continuous, there is no savanna, the pattern of rainfall is less seasonal, and the human population density is much higher. The mammalian fauna is roughly similar, with elephants (*Loxodonta africana*) and forest buffalo (*Syncerus caffer nanus*) found on both sides of the Uele River, and hippopotamuses (*Hippopotamus amphibius*) living in most of the big rivers. There are, however, notable differences: lions (*Panthera leo*) and spotted hyenas (*Crocuta crocuta*) are common in the north, but not present in the south; whereas the opposite is the case for okapis (*Okapia johnstoni*) and red colobus monkeys (*Piliocolobus foai*) (Hicks, in prep).

Over the course of our study, we worked with several different ethnic groups (Hicks, in prep.). North of the Uele, the majority of villagers were Azande, while in towns such as Bili, immigrants of other Congolese ethnicities were also present. Some Azande also lived in settlements adjacent

to the south bank of the Uele River, but the majority of indigenous South Uele people were Baboa (in Buta and Bambesa) and Babenza (in Aketi). Each of these major groupings was then divided into a number of sub-groups. Various fisher-folk, such as the Bakango and the Lokele, plied the Uele River in their canoes. We were told by our Babenza contacts that a nomadic hunting people called the Bangalema were invading their forests from the southeast. We rarely met these people and were told that they tended to avoid settlements and live in the forest. In and around Buta and Aketi there were also a large number of recent immigrants from all over DRC and elsewhere; most of them had apparently arrived in the last decade, following expansion of informal sector mining in the region.

Survey goals

The goal of our study was to gain better knowledge of the presence and distribution of chimpanzees in Northern DRC, and to gauge the degree of threat they face from humans. Our survey data revealed a developing crisis facing chimpanzees in the Buta-Aketi region south of the Uele River. The data also allowed us to compare the occurrence of chimpanzee orphans and bushmeat in several major areas undergoing different levels of settlement and development. This knowledge leaves us better-placed to identify the factors contributing to the hunting of chimpanzees, to identify the localities where action is most needed and most likely to succeed, and to slow or stop the killing.

Invasion of artisanal-scale miners into the Rubi-Tele Domaine de Chasse, 200 km south of the Bili region, during the period preceding this study was associated with devastating bushmeat hunting (Hart, 2007). Our results indicate a similar trend in the Bili-Buta region. The problem is larger and more widespread than anticipated, and expanding. Without immediate intervention, one of DRC's most important populations of chimpanzees will be at high risk of depletion or extirpation.

METHODS

Chimpanzee surveys, 2004-2009

The primary goal of our long-term research in northern DRC was to determine the distribution and abundance of chimpanzees in selected areas within this large landscape. Inventories and behavioral research were the focus of the first field season at Bili (August 2004 – July 2005). In 2005, we conducted 160 km of line transects through the Bili and Gangu Forests northwest of Bili, to make direct encounters with chimpanzees and to count chimpanzee nests and other indirect sign, as well as evidence of other large mammals. For all chimpanzee nests encountered on the transects, we measured the perpendicular distance from the nest to the transect line to permit estimation of nest density using DISTANCE software (Buckland *et al.*, 1993). For our analysis, only

nests spotted from the transect were included, and ground nests were excluded.

Between 2004 and 2007, we conducted 1,783 km of non-systematic forest walks in search of chimpanzees at six sites in the forests north of the Uele River. A further 506 km was surveyed at 10 sites to the south of the Uele River from 2007 to 2009. Forest walks sometimes followed human or elephant paths, but often we did not use trails and instead attempted to locate chimpanzees by following their vocalizations. We recorded all encounters with chimpanzees, chimpanzee nests, and other evidence of their occurrence, as well as indicators of other large mammals. We also recorded evidence of hunting, mining, and other human activities encountered along the line of travel. The forest walks differed from the line transects in that a pre-established compass line was not used to guide the surveys, and perpendicular distances from the line of travel to the object were not measured. Distances traveled and all evidence of chimpanzees and other large mammals were recorded with a GPS. Figure 2 shows the routes walked in

relation to population centers and roads. A more detailed methodology will be published in Hicks (in prep.)

Bushmeat and chimpanzee orphan study, 2004-2009

During the first field season, 2004-2005, forest work was our focus; therefore, opportunities to record orphans and bushmeat were limited to the period when TH visited Bili Town or traveled on the roads. From July 2006 to September 2007, two or more local assistants were permanently stationed in Bili Town and instructed to report all elephant and chimpanzee bushmeat and all chimpanzee orphans seen. During this period, TH and JS visited 10 additional towns and villages in the region between the Uele River and the border with the Central African Republic. Between September 2007 and March 2009, forest surveys were shifted to sites south of the Uele River, with the addition of orphan and bushmeat surveys in cities, towns, and along the roads. South of the Uele, we saw or received frequent reports of orphan chimpanzees, including offers by merchants eager to sell us their orphans.

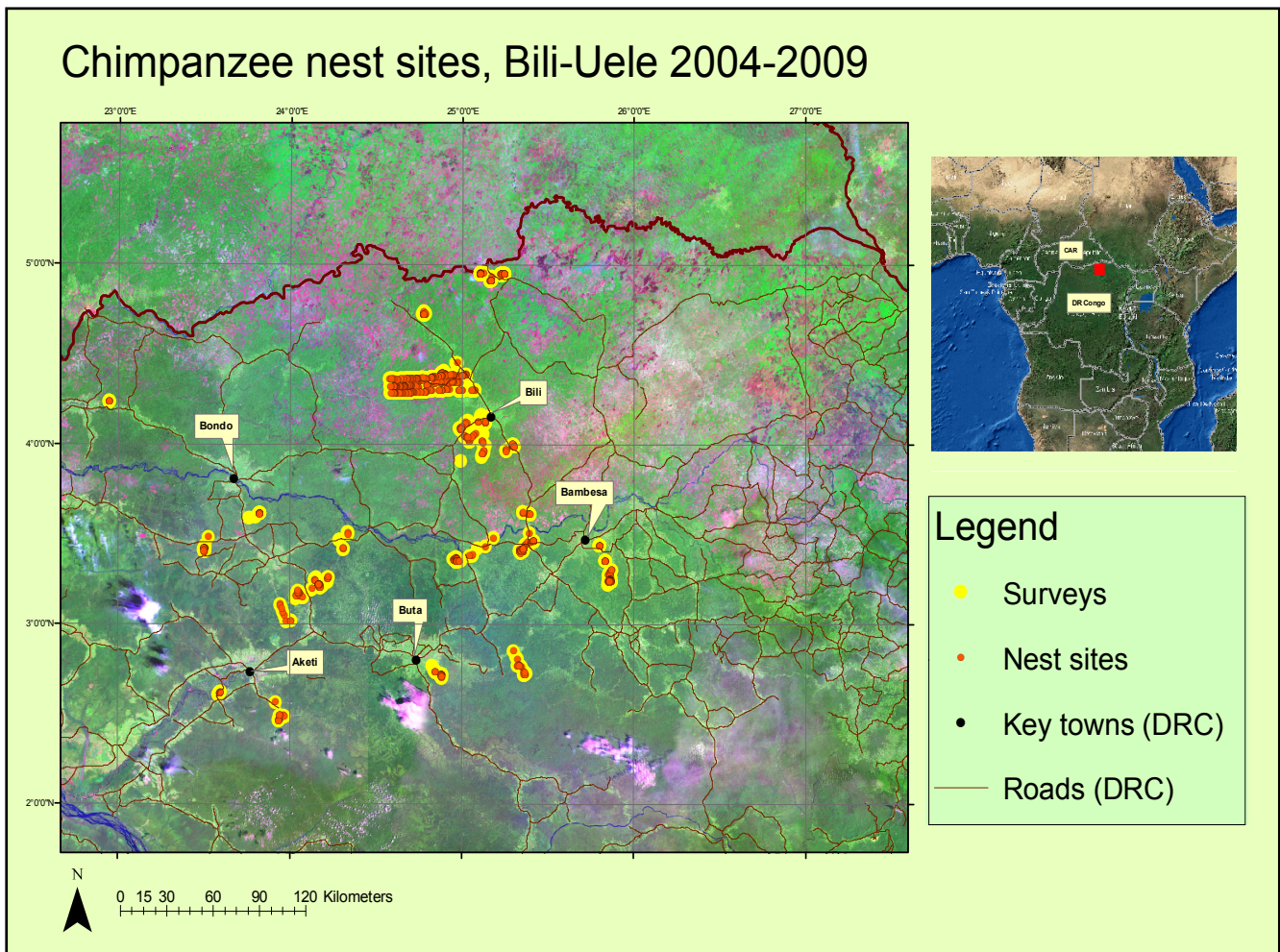


Figure 2. Locations of surveys and chimpanzees nests in the northern DR Congo study area.

We documented all direct encounters with orphans and sightings of bushmeat, and followed up on all credible leads. Orphan and bushmeat surveys included interviews in villages, queries along routes travelled, and observations and informal interviews in bushmeat markets.

Data collected on each chimpanzee orphan or chimpanzee carcass encountered included the following: date, location of observation (including a GPS point if possible), sex, age, and condition of health of the orphan, origin of the chimpanzee, fate of the chimpanzee (if known), name and profession of owner, and how the owner had acquired the orphan or carcass. We also asked hunters to describe their hunting practices and, in the villages, inquired as to the preference and frequency of eating chimpanzee bushmeat. We asked our numerous contacts and neighbors about their beliefs regarding chimpanzees and whether or not one should eat them. TH's discussions with hundreds of Congolese men and women were informal and ad libitum. Much additional information about local beliefs and chimpanzee-hunting in the area was acquired by interviewing our local assistants, all of whom had been hunters in the past: Kisangola Polycarpe (a Benza from Aketi), long-time Bili resident Olivier Esokeli (a Boa), and Ligada Faustin (a Zande from Bili). LD conducted more systematic interviews in the Aketi region, with 144 miners in mining camps and 75 villagers. The questions she asked included: Where are you from originally? Have you eaten a chimpanzee? How often? Have you killed a chimpanzee? How many times? With what?

During the entire 18-month South Uele field season, we had staff stationed in the city of Aketi who recorded all chimpanzee orphans and bushmeat that they saw. We also conducted regular undercover visits to the bushmeat markets of Aketi and Buta to look for primate bushmeat. While traveling along roads frequented by motorbikes or other vehicles to reach our forest survey sites, we inquired about chimpanzees and bushmeat offered for sale. A 'road trip' consisted of one passage per day (not both directions), and kilometers covered were summed over multiple road trips. We conducted road surveys on foot, bicycle, or motorbike, and occasionally in a truck. The number of days spent in cities and towns, and the kilometers traveled over the course of the study period, are shown with the results to be presented in Tables 1 and 2, below. Encounter rates for bushmeat and orphans were calculated by dividing the number of orphans seen in a particular settlement or along a particular section of road by the number of days spent there, or by the number of kilometers traveled. While our surveys focused on chimpanzee bushmeat, we also documented the occurrence of bushmeat of other rare or protected species.

We distinguish between 'confirmed' and 'unconfirmed' chimpanzee orphans and carcasses. 'Confirmed' cases were limited to evidence observed directly by one of the project staff. In the cases where primate meat found at a market

had been cut up into small pieces, we required that the vendor of the meat confirm that it came from a chimpanzee. Chimpanzee bones could usually be distinguished from those of other primates by their larger size, and the meat was consistently redder in color than monkey meat. When possible, we collected testimony from multiple witnesses for each item of evidence, taking care never to exchange money for information. We utilized video recording and/or photographic evidence to ensure reliability of project staff reports of bushmeat, and monetary rewards were given to staff only when such evidence could be obtained. In cases where separate sightings of chimpanzee bushmeat might have represented the same individual animal, we conservatively considered the meat as having come from one individual. The photographic record made of the orphans we encountered assisted in avoidance of counting the same orphan more than once.

We received many first-hand reports of chimpanzee orphans and bushmeat. Some of these reports came from expatriate missionaries, bushmeat vendors, hunters, and village informants. In order to acknowledge the possibility that these informants might have misidentified other primates as chimpanzees, or that they might have been unreliable observers, we consider this evidence 'unconfirmed'. Whenever possible, an effort was made to triangulate the accounts. Due to our inability to confirm all leads, some reports were conservatively discounted. It is therefore likely that we have underestimated the number of chimpanzee carcasses and orphans.

RESULTS AND DISCUSSION

Chimpanzee occurrence in northern DRC

We encountered numerous chimpanzee nests in every forest region that we surveyed, both to the north and south of the Uele River (Figure 2). Chimpanzees, their nests, and other signs were found close to roads and within 4 km of Bili, and even within 13 km of the large commercial centers of Buta and Bambesa. On transects in the Bili region north of the Uele River, overall tree nest encounter-rate was 2.43 nests per km walked, with the encounter rate in the remote Gangu Forest more than double that of the forest nearer the road (Hicks, in prep.). Although we did not carry out transect work south of the Uele, we recorded nest encounter rate on our non-systematic forest walks. The tree nest encounter-rate south of the Uele was 1.65 nests per km walked, vs. 0.35 nests per km walked off-transect in the Bili region (for the remote Gangu Forest considered alone: 0.61 nests per km walked). In these non-systematic forest walks, nest encounter-rate was higher to the south than to the north of the Uele. Although some methodological issues may contribute to this difference, the most likely explanation is that there is more continuous forest-cover and lack of savannas south of the Uele River, thus providing the chimpanzees with more habitat. It should be noted,

however, that these are nest counts; an estimation of actual chimpanzee numbers in the region is beyond the scope of this paper.

Chimpanzee Orphans and Bushmeat

Between 2004 and 2009, we spent 1,365 days in 10 cities and towns and associated villages, and covered 13,140 km of road survey. We recorded 35 chimpanzee orphans in cities, towns, and villages, and nine more orphans along the roads. We also documented 31 chimpanzee carcasses in cities, towns, and villages, and four along the roads (Tables 1 & 2; Figure 1).

All but two of the 44 confirmed orphans and one of the 35 confirmed bushmeat carcasses were found to the south of the Uele River, despite comparable survey intensity on both sides of the river. These differences appeared to be associated with differences in settlement and, especially, mining in the two regions. Our survey region to the north of the Uele River has only three major settlements and a

population density ranging from 3.5 to 5.2 people per km² (Rapport Annuel Territoire de Bondo, 2008). Before 2007, there was almost no mining activity in the Bili region. In contrast, South Uele has a number of major cities and towns, and many mining camps. The population density in the South Uele survey region ranges from 6.2 to 18.4 people per km² (Monographie de la Province Orientale, Kinshasa, 2005).

South of the Uele, we documented a massive and unregulated commerce in bushmeat, including trade in chimpanzee bushmeat and orphans, as well as ivory and okapi skins. This illegal trade appears to be accompanying artisanal miners as they invade formerly remote areas such as Aketi and Rubi-Tele (Hicks, unpubl. data; Darby, unpubl. data; Hart, 2007). The South Uele trade in chimpanzee orphans and bushmeat was centered around the cities of Aketi, Bambesa, Buta, and Banalia, covering a potential hunting catchment area of over 12,000 km². In addition to chimpanzees, we documented 10 okapi and nine leopard

Table 1. Chimpanzee orphans and bushmeat recorded in surveys in towns, cities, and villages in northern DR Congo 2004-2009^{1,2}

Locality	Dates	Survey days	Chimpanzee Orphans			Chimpanzee carcasses		
			Confirmed	Not confirmed	Total	Confirmed	Not confirmed	Total
North Uele								
Bili	2004-2007	498.5	0	0	0	1	0	1
Api	2006	2	0	0	0	0	0	0
Zapay	2006	15	1	0	1	0	0	0
North villages	2004-2008	57.5	0	0	0	0	0	0
Total North	2004-2008	573	1	0	1	1	0	1
South Uele								
Buta	2007-2009	177	17	5	22	6	1	7
Aketi	2007-2009	549	9	3	12	23	1	24
Likati	2007-2008	17.5	4	1	5	0	0	0
Bambesa	2008	3.5	1	0	1	0	0	0
Leguga	2008	6.5	0	0	0	0	0	0
Dulia	2008	2	0	0	0	1	0	1
Titule	2008	7.5	2	1	3	0	1	1
Buta villages	2008	2	0	0	0	0	0	0
Bambesa villages	2008	11	0	0	0	0	0	0
Titule villages	2006, 2008	6	1	0	1	0	0	0
Likati villages	2007-2008	10	0	0	0	0	0	0
Total South	2007-2009	792	34	10	44	30	3	33
Grand Total	2004-2009	1365	35	10	45	31	3	34

¹ At Bili, between 2003 and 2004 and prior to TH's August 2004 arrival, Karl Ammann and associates adopted at least three chimpanzee orphans, one originating from the forests of Bili, and two more from the southeast of Bili, in the forests near Api. These orphans, not included in our tally, were flown in August 2004 to the Chimfunshi Sanctuary in Zambia.

² Additional orphans were observed, but not included in the tally, being outside of our study region and/or the time period of our study: Hicks and Swinkels observed a total of three chimpanzee orphans in Kisangani (Hicks, 2009). A traveling photographer showed us a recent photo of a chimpanzee orphan kept in Nyapu, a town to the southeast of Bambesa. Kisangola Polycarpe documented another five orphans in the Aketi-Likati region between April and July 2009, and JS observed chimpanzee meat on the Buta-Aketi road in July 2009.

Table 2. Chimpanzee orphans and bushmeat recorded along roads in northern DR Congo 2004-2009¹

Road traveled	Dates	Km traveled	Chimpanzee Orphans			Chimpanzee Carcasses		
			Confirmed	Not confirmed	Total	Confirmed	Not confirmed	Total
North Uele								
Bili-Adama	2004-2007	1574.3	0	0	0	0	0	0
Baday-Zapay	2004-2006	524.5	0	0	0	0	0	0
Bili-Bambilo	2005-2006	404.6	0	0	0	0	0	0
Bili-Api	2006-2007	314.7	0	0	0	0	0	0
Bondo-Monga-Bambilo	2009	234	1	2	3	0	0	0
Total North	2004-2009	3052.1	1	2	3	0	0	0
South Uele								
Buta-Bambesa	2006-2008	3087.1	4	6	10	1	0	1
Buta-Aketi	2007-2009	4909.7	2	3	5	3	4	7
Buta-Ngume	2008	145.6	0	0	0	0	0	0
Buta-Banalia	2007-2008	1945.3	2	0	2	0	0	0
Total South	2007-2009	10087.7	8	9	17	4	4	8
Grand Total	2004-2009	13139.8	9	11	20	4	4	8

¹We saw no non-rodent bushmeat, and only one orphan monkey, on the 1,140 km we traveled on the highway between Banalia and Kisangani (Nov. 2007 - Dec. 2008), a route not included in our survey results. The forests along this stretch may already have been hunted out, as suggested by interviews with locals.

(*Panthera pardus*) skins, parts of 14 elephants, bushmeat from two hippopotamuses, 169 monkey carcasses and 69 monkey orphans. To the north of the Uele River, in contrast, TH and JS encountered no leopard pelts and only 16 monkey orphans and six monkey carcasses over a similar period of time (19 months), along with the ivory and meat of 10 poached elephants over a 26-month period.

South of the Uele River, in forests where artisanal mines were located and in forests close to large towns and cities, we documented hundreds of snares, including dozens of 2.5-m high ‘bomb’ traps (thick wire snares attached to bent saplings which are capable of hoisting an okapi up into the air), along with a large number of spent cartridges (Hicks, in prep). These items were never encountered in the Gangu and northwest Bili forests to the north of the Uele.

Our observations documented markedly different situations in the areas north and south of the Uele River. These distinctions are presented in separate detailed accounts of the chimpanzee orphans and bushmeat recorded in the two regions.

North of the Uele River

Only two chimpanzee orphans and one chimpanzee carcass were confirmed north of the Uele River during 27 months of study, which included 573 days in three towns

and a number of villages, and 3,052 km traveled along the regions’ roads (Tables 1 & 2; Appendix I). Of the North Uele orphans, one of the confirmed cases and both of the unconfirmed cases were documented in the Bondo area in 2008 and 2009, postdating the opening of the mines at Bili. Bondo is a regional mining center. No orphans or chimpanzee bushmeat were reported in Bili between 2004 and 2007, the period preceding the gold rush, despite regular visits and investigation. Chimpanzee bushmeat was seen by project staff only once north of the Uele, in a small village near Bili Town during August 2007, following invasion by gold miners.

In 2008, we received reports from travelers of two chimpanzees offered for sale in the Bili area; one was kept at a gold mine. Although we did not include these cases in our tallied results, they may indicate that in the time since the opening of the gold mines at Bili, trade in chimpanzee orphans has been (re)initiated (see footnote 1, Table 1). In 2008 and 2009, two of the confirmed orphans we encountered at Buta and Aketi were reported to have come from Bili.

South of the Uele River

Between September 2007 and March 2009, we spent 792 days in settlements south of the Uele River

and traveled 10,088 km along the roads. We documented 42 confirmed chimpanzee orphans and 34 chimpanzee carcasses during this time (Tables 1 & 2; Appendices I and II). Figure 1 indicates where we found the orphans and carcasses, including ‘unconfirmed’ cases. Seventeen (41%) of the confirmed South Uele orphans were encountered in or around the city of Buta, and 23 (68%) of the confirmed carcasses were observed in Aketi.

The encounter-rate for chimpanzee orphans and carcasses south of the Uele River was 20-30 times higher than to the north. While at Buta, we observed a new orphan arrive once every 10 days, on average. Our encounter-rate with orphans at Bambesa, Likati, and Titule was two to three times higher than this, although we spent less time in these three settlements. Two of the orphans in Buta which had been reported to us by local informants were dead and buried by the time we verified the reports; we excavated their bodies and photographed their skulls.

Owners of the orphans, and the orphans’ fates

In total, 10 (22.7%) of the 44 chimpanzee orphans observed died of illness or malnutrition soon after capture. The majority of the others were kept as pets or were offered for sale. Figure 3 shows the occupation of the owners of 35 orphans who were willing to provide the information. Eleven and a half percent of the orphans were kept by police (8.6%) and military (2.9%), and 14% by government officials. More than 8% were kept by traditional chiefs. Merchants who held orphans often reported plans to transport them to either Kisangani or Bumba, and we observed them doing so in several cases (Appendix II). From these cities, the baby chimpanzees could be sold or shipped down the Congo River to the capital, Kinshasa.

We adopted eight of the chimpanzee orphans we encountered between 2007 and 2009. Our policy was never

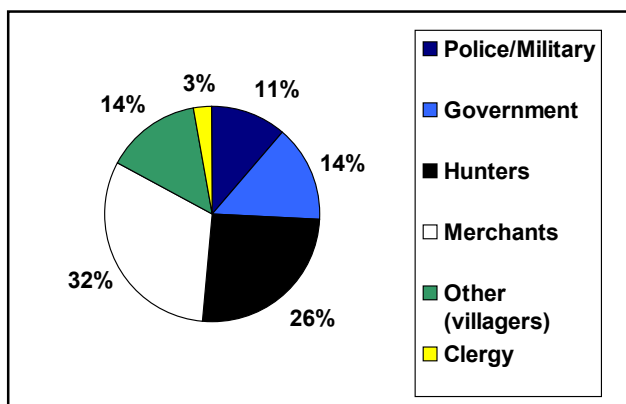


Figure 3. The occupation of 35 owners of orphan chimpanzees in Northern DRC, 2004–2009. ‘Merchants’ include both locally based traders (owning 22.9% of the orphans) and business men from regional centers (owning 8.6% of the orphans). ‘Hunters’ refers to individuals who originally acquired the orphan from the wild. ‘Government’ includes indigenous chiefs (owning 8.6% of the orphans) and state officials (owning 5.7% of the orphans).

to exchange money or gifts for these orphans, and we took them only from owners who were willing to part with them after we had convinced them that keeping chimpanzees was illegal and dangerous. Whenever possible, we asked former owners to provide signed affidavits assuring that no money exchange had been made; we also obtained a document from the local supervisor of the environment at Aketi allowing us to keep the chimpanzees. We lost three of the orphans to illness or trauma resulting from the mistreatment received at the hands of their captors. The remaining five orphans were cared for in a temporary refuge in Aketi (Bonganzulu) until March 2009, when they were flown to the Centre de Rehabilitation des Primates de Lwiro, a sanctuary near Bukavu in eastern DRC, under the supervision and regulation of the ICCN (Institut Congolais pour la Conservation de la Nature) (Hicks & Darby, 2009).

Buta and Aketi as centers of chimpanzee bushmeat commerce south of the Uele

In addition to being centers for the buying and selling of chimpanzee orphans, the cities of Buta and Aketi had the highest occurrence of chimpanzee carcasses of all the areas surveyed (Table 1). Most of the chimpanzee meat we saw was sold and consumed in or near these cities. All but three of the chimpanzee carcasses or skeletal material we recorded south of the Uele River belonged to animals killed within the past year. In most cases they were from freshly-butchered chimpanzees. The three older skeletons dated from within the past 5 years. In the Aketi market, the price of a large piece of chimpanzee limb was between 1,500 and 2,000 francs (approximately \$3) - less than the price of a small chicken (approximately \$5), which had a much smaller volume of meat.

Origins of the chimpanzee orphans and bushmeat

We determined the approximate regions of origin for 41 of the chimpanzee orphans and 26 of the chimpanzee carcasses that we encountered (Table 3). Six of the orphans had been taken from the forests between the cities of Buta and Banalia, in the southern section of our survey region. At least three of these had reportedly come from inside the Rubi-Tele Domaine de Chasse. The forests of Aketi, Likati-Angu, and Buta-Kumu (between the Uele and Rubi Rivers) produced a large number of orphans, as well. Only four orphans were reported to have come from forests north of the Uele; two of them ended up as pets in Aketi and Buta.

We recorded similar trends for the origins of chimpanzees killed for bushmeat. Over half came from the forests around the city of Aketi (and four of those came from the forests southwest of Aketi towards Bumba, which is a major logging zone operated by the company SIFORCO). Four were from inside the Rubi-Tele Domaine de Chasse south of Buta. Only one carcass originated from north of the Uele.

Chimpanzee-hunting and local attitudes towards killing chimpanzees

Chimpanzee meat is a popular ingredient in soup in the cities of Buta and Aketi, and is sold openly in city markets in this region (Appendix II). The apes' bones are also sought for use in traditional medicines. In Aketi, we were told that bones were ground up and inserted into cuts, or into the rectums of human infants 'to make them strong.'

In the past, and among at least some local communities, chimpanzees seem to have been protected by traditional taboos. For example, many Azande and Babenza women told us that they refused to eat or even cook ape meat, in fear of giving birth to babies with 'big ears.' The Barisi people claim to have a taboo against eating chimpanzee meat, as they consider themselves to be descended from a union of chimpanzees and humans. These taboos, however, are now breaking down. The growing popularity of the recently-established religious sect of Branhamism, based on the doctrine of the American prophet William Branham, appears to be weakening these ancestral prohibitions against the consumption of chimpanzee meat. Branham's teachings are interpreted locally as encouraging the consumption of all forms of wildlife. Finally, according to project worker Kisangola Polycarpe, a lifelong resident of Aketi, nomadic

Bangalema hunters are spreading into the forests of Aketi from the south and decimating the wildlife, including chimpanzees.

We were informed by hunters in the forest zone south of the Uele River that the preferred way to hunt chimpanzees is to pursue the apes with packs of dogs, chase them up into trees, and then kill them with a shotgun or crossbow with poison arrows. Alternatively, hunters will stealthily approach a group of arboreally-feeding chimpanzees at dawn, picking them off one-by-one with crossbows and poison arrows. The crossbow's silence allows the hunters to kill a number of individuals before the group becomes aware of the hunter. Cooking later denatures the poison, making the meat safe for consumption. Kisangola Polycarpe, once a hunter himself, described having witnessed in 1999, just south of Aketi, an entire party of chimpanzees that had been killed in this way; 10 dead youngsters and adults were sprawled at the base of a tree, their eyes "bulging out" from the effects of the poison.

Unlike elephants, okapis, and hippopotamuses, which in some areas seem to be afforded a degree of protection by the regional Congolese authorities, few officials or merchants with whom TH discussed the problem seemed to be aware of the protected status of chimpanzees. Two chimpanzee merchants, one in Buta and one in Titule, had documents signed by local officials allowing them to keep and sell their baby chimpanzees (Figure 4). These permits were issued illegally, as chimpanzees are protected by Congolese law. We were also informed that bushmeat vendors regularly bribe officials for permits allowing them to sell the meat of chimpanzees and other protected species. This is not surprising considering that government officials, police, and military frequently owned orphans themselves (Figure 3).

The chimpanzee orphans that we encountered were generally kept in abysmal conditions, often tied to short ropes inside squalid enclosures. Two of the orphans we saw had their top incisors knocked out or burned down to stubs with hot knives to prevent biting (Appendix II). Based on the interviews we conducted, there seemed to be no awareness among the local villagers or government officials of the potential risks of disease epidemics that might emerge from the killing and capturing of chimpanzees or other primates (see Weiss & Wrangham, 1999; Keele *et al.*, 2006). We filmed a hunter near Buta with a recent bite-mark on his heel, inflicted by a dying mother chimpanzee just before she was killed with a machete. The chimpanzee orphan he was keeping was suffering from a machete wound to the arm, acquired during the same incident.

The increasing market for chimpanzee bushmeat and orphans

According to local sources, the widespread slaughter of chimpanzees for bushmeat and the sale of their orphans is a recent phenomenon postdating the collapse of President

Table 3. Origins of 41 chimpanzee orphans and 26 chimpanzee carcasses recorded in villages, towns, and cities and along roads in the northern DR Congo: 2004 – 2009. Localities separated by hyphens indicate that the orphans came from forests in between two localities.

Forest of Origin	Orphans	Carcasses
North Uele		
Bili	1	1
Bili – Bondo	2	0
Zapay	1	0
Total North	4	1
South Uele		
Aketi	6	15
Buta	2	0
Buta – Aketi	3	3
Buta – Bambesa	7	0
Buta – Banalia	6	5
Ngume	2	1
Lebo	2	0
Bambesa	3	1
Bambesa – Zobia	1	0
Likati	5	0
Total South	37	25
GRAND TOTAL	41	26

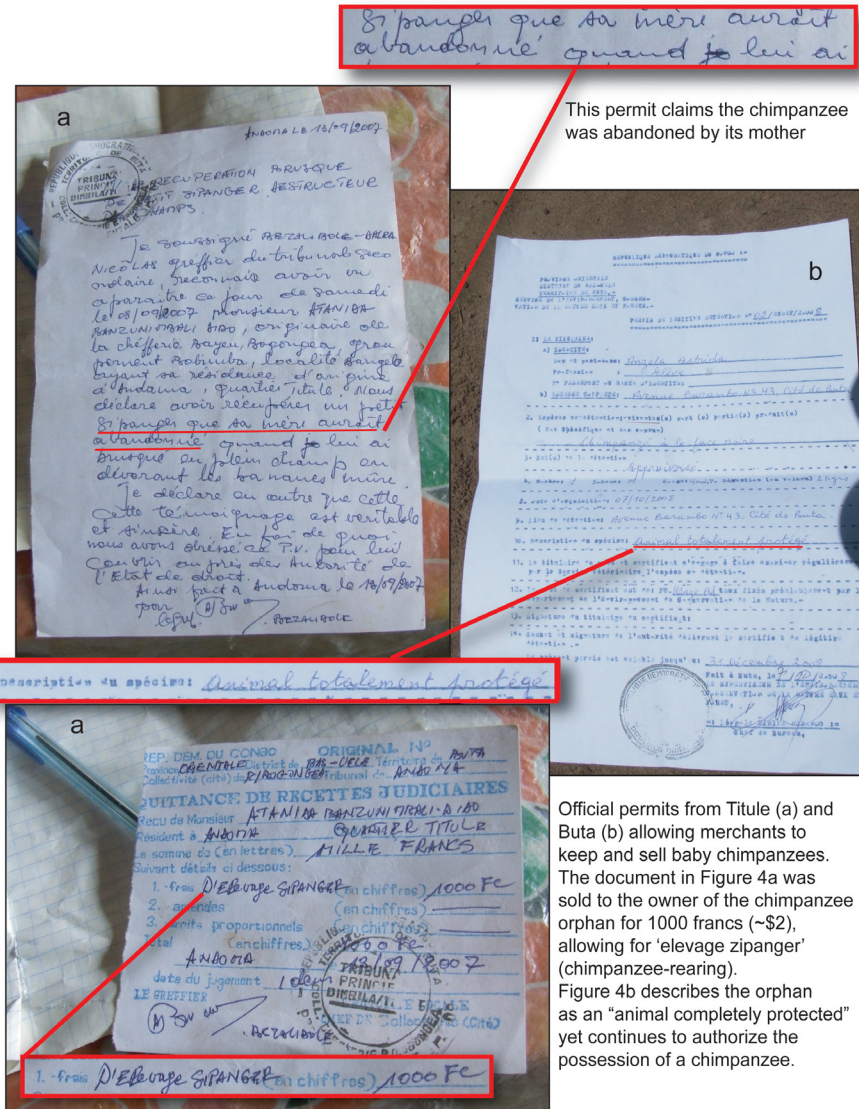


Figure 4 (a&b). Permits provided by government officials in Titule and Buta allowing merchants to keep and sell baby chimpanzees.

Mobutu's rule in 1997. This accords with our observation of abundant chimpanzee nests in the region, even in the vicinity of cities and larger towns. Chimpanzee orphans and bushmeat could not have been removed from the forests at the rate we observed for long without emptying the forests in the vicinity of settlements, where we found both evidence of chimpanzees and recent indicators of hunting (Figure 2). This is illustrated by the case of Aketi; despite having seen 23 chimpanzee carcasses and nine orphans in Aketi since September 2007, we found regular evidence of chimpanzees in our forest surveys within 25 km of the town. These numerous indications of chimpanzee presence would not be expected if the species had been regularly targeted by hunters near this city in the past. We found a similar trend in Bambesa and Lebo, where we encountered chimpanzee orphans and carcasses which had reportedly been killed locally, but also ape nests and other chimpanzee

evidence close to plantations and towns, and within 1 km of roads and village centers. Most surprisingly, we found numerous chimpanzee nests, tools, and feeding remains within 13 km of the largest commercial and bushmeat center of the region, Buta (population 45,208) (Monographie de la Province Orientale, Kinshasa, 2005).

The expansion of artisanal-scale mining, the lack of alternative employment, and low benefits from the sale of agricultural crops were frequently cited in discussions with hunters and villagers as the primary reasons for the recent explosion of commercial bushmeat in this region. The proliferation of artisanal mines throughout the South Uele forests appears to be a primary factor promoting the expansion of this damaging trade. In interviews with villagers and miners, LD found that the miners relied to a higher degree on primate bushmeat than did villagers, and that a higher proportion of miners admitted to hunting and

eating chimpanzees (Darby, unpubl. data). Miners often come from distant cities with more commercial economies and fewer food taboos. They set up camps deep in the forest and rely more on bushmeat than on domestic animals. In our South Uele forest surveys near Buta, Aketi, Likati, and Ngume, we found hundreds of recently-excavated gold and diamond pits (Hicks & Darby, unpubl. data), often in association with hunting camps. Artisanal-scale mining has been established for over 20 years in the Rubi-Tele Hunting Reserve south of Buta, during which time the fauna has been substantially reduced by hunting (Hart, 2007). Encounter rates of chimpanzees and other fauna were much lower in this region than in forests immediately to the north. Further north, across the Uele River, chimpanzees were abundant, and in some remote forests showed little fear of humans. We found almost no evidence of recent mining activity in the forests north of the Uele.

Overall, we can infer that the expansion of informal sector mining has increased the exploitation of chimpanzees and other bushmeat both directly, in order to meet a growing demand for meat, and also indirectly, as a source of revenue as the region has opened to wider trade. The expansion of mining in the region has led to the influx of a wide range of small-scale traders and other economic operators, most of whom, like the miners themselves, operate at a poorly-controlled informal level. These traders eagerly purchase chimpanzee orphans and bushmeat as a low-risk but speculative opportunity to diversify potential sources of revenue.

CONCLUSION AND RECOMMENDATIONS

The number of orphans and bushmeat carcasses we encountered clearly indicates that the chimpanzees of northern DRC are now under major threat. According to Goodall (1996), as many as 10 chimpanzees may die for every orphan that appears for sale in a big city market. It appears that in northern DRC we are now witnessing the beginning of a massive ape decline. This threat appears to be entirely the result of human hunting, uncompounded by disease or habitat loss, as has occurred elsewhere in West Africa (Butynski, 2001; Campbell *et al.*, 2008) and West Central Africa (Walsh *et al.*, 2003). Thus, there may still be time to stop the decline. Considering that the area is home to one of the largest remaining continuous populations of chimpanzees, it is urgent that a concerted effort be made immediately to reverse the process.

We recommend four lines of intervention to respond to this major and urgent threat: 1) Bring an end to the slaughter, 2) Establish formal protection for key chimpanzee populations and their habitats, 3) Begin educational campaigns via films and radio, and 4) Ensure the care of existing orphans.

The illegal killing of chimpanzees must be halted. To do so requires enforcement of existing wildlife laws, in-

cluding the arrests of chimpanzee hunters and seizures of bushmeat and orphans. We have found that the demand for chimpanzee body parts, used for charms and traditional medicines, is limited and local. Although there may be a new market for chimpanzee orphans emanating from Kinsangani or Kinshasa, the primary reason for killing chimpanzees in northern DRC is for their meat. The killing of this species therefore can be reduced by increasing the costs of hunting chimpanzees and the price of their meat relative to other types of meat. Enforcing laws is one way to increase the cost of killing and selling chimpanzees. John Hart encountered a similar situation facing bonobos (*Pan paniscus*) in the Maniema province south of the Congo River, with an average of nine bonobos per month arriving in Kindu as commercial bushmeat (Hart & Hart, 2009). An edict by the governor re-enforcing the national law against killing apes and establishing a closed season on hunting, accompanied by a concerted media campaign and monitoring of key bushmeat transport routes, nearly eliminated the sale of bonobo bushmeat, and reduced the killing in the forest. A similar effort focused on chimpanzees is needed in northern DRC and should be initiated as soon as possible.

The presence of commercial bushmeat hunters in mining camps is a major threat to chimpanzees. Mining camps are often located in remote forest, providing a base of operations for hunters together with a market for the meat. Limiting access to mining sites by hunters and controlling hunting by artisanal miners is urgently needed if chimpanzees are not to be directly threatened by the expansion of informal sector mining in DRC.

We recommend the initiation of a conservation information campaign in Buta, focused on shutting down the bushmeat trade in chimpanzees, okapi, elephant, and other protected species. Buta is the seat of the regional government where most important decisions are made for the District of Bas-Uele.

The most important remaining intact populations of chimpanzees in northern DRC require formal protection by re-enforcement of current protected areas, and the establishment of new ones. At present, the Bili – Gangu zone is the most important area for formal protection; its development as a national park is warranted based on the large numbers of chimpanzees in the area, their naiveté toward humans, and the occurrence of a distinct chimpanzee culture (Hicks, in prep.). In addition, the occurrence of other endangered species, including elephants and lions, enhances the value of this site for the highest level of conservation. The presence of chimpanzees, hippopotamuses, and okapis south of the Uele River, along with a relict population of elephants, makes the establishment of protected areas crucial there, as well. The potential for long-term investment in research and conservation by international partners enhances the importance of this site as a candidate for high-level protection. It is urgent to assess the current condition

of the Bili-Gangu Forest and its fauna, and to evaluate other potential high biodiversity areas which are not yet surveyed.

Even if halted, the current trend in chimpanzee-killing will leave a growing legacy of orphans, most of which face a dire future, if they manage to survive. The Wasmoeth Wildlife Foundation is establishing a chimpanzee sanctuary on the island of Boyoma, near Kisangani. This will provide a local base to support these orphans. A well-managed sanctuary will encourage government officials to confiscate orphan apes and will also aid in the conservation education of local populations.

The urgency for conservation action in the northern DR Congo could not be greater. The region retains one of Congo's last concentrations of large mammals, but this fauna is under imminent threat of rapid depletion. Conservation in the region has been all but totally neglected by the Congolese administration, and by the international community, as well. Without concerted action, one of the world's most important remaining populations of chimpanzees will soon be depleted or extirpated.

NOTE:

For more information on our large mammal survey south of the Uele River and the chimpanzee bushmeat crisis in Northern DRC, please see the three-volume e-book: Hicks, T.C. Trading Chimpanzees for Baubles: A Bushmeat Crisis in the Northern DR Congo; Aketi Field Season 2007-2008. Available at: <http://wasmoethwildlife.com/folder2007-2008/part1/index.html>

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Chimpanzee Orphan with a Crowd

Photograph by T.C. Hicks

Appendix I (a-d): Gallery of Orphans by Location

Ia: Orphans Found South of the Uele River 2007-2009



Kisanola
(M) 9/07, Bokpondo, fate: died



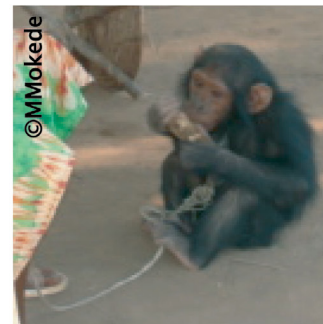
Kathé
(F) 11/07, Likati, fate: sanctuary



Monde-Arab
(M) 12/07, Bopandu, fate: died



Unnamed
(U) 12/07, Buta, fate: unknown



Toni
(F) 3/08, Aketi, fate: unknown



Bima Bolungwa
(F) 4/08, Dembia, fate: sanctuary



Le Blanc
(F) 10/08, Buta, fate: unknown



Tigre
(M) 4/08, Titule, fate: died



Ndiyo
(F) 10/08, Buta, fate: unknown



Pauline
(F) 5/08, Buta, fate: unknown



Jackle
(M) 6/08, Buta, fate: died



Sabine
(F) 7/08, Buta, fate: unknown

Ib: Orphans Found South of the Uele River 2007-2009



Django Mayanga

(M) 7/08, Buta, fate: sanctuary



Girl

(F) 7/08, Yema, fate: pet



Aketi Kigoma

(M) 11/08, Aketi, fate: sanctuary



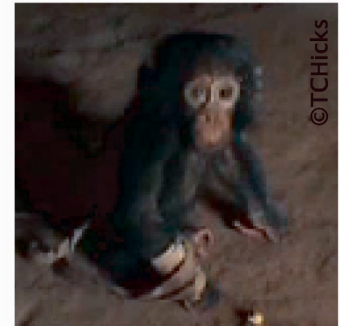
Manga

(U) 8/08, Titule, fate: unknown



Mangay

(M) 8/08, Lebo, fate: sanctuary



Wasekwa

(M) 8/08, route to Bambesa, fate: unknown



Jerome

(M) 8/08, Buta, fate: unknown



Mokomboso

(M) 9/08, Buta, fate: unknown



Azanga Mama

(F) 9/08, Buta, fate: unknown



Thuraya

(M) 11/08, Lalu, fate: unknown



Bob

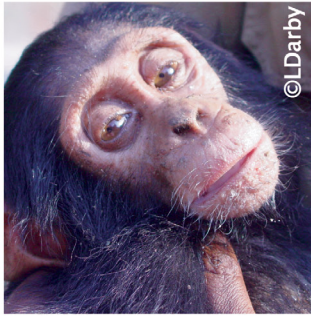
(M) 11/08, Bopandu, fate: pet



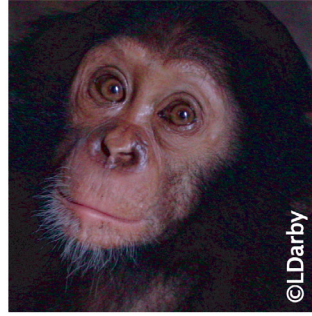
Lundi

(F) 10/08, Buta, fate: unknown

Ic: Orphans Found South of the Uele River 2007-2009



Akuma Cleveland
(M) 1/09, Aketi, fate: died



Souza Siforco
(M) 2/09, Aketi, fate: died



Tigo
(M) 10/08, Buta, fate: died



Lao Di Ka
(M) 11/08, Aketi, fate: unknown

Fourteen Orphans Have No Photograph

Sileri (F) 3/08, Aketi, fate: died
Unnamed (M) 9/07, Buta, fate: unknown
Unnamed (M) 9/07, Buta, fate: pet
Unnamed (U) 9/07, Buta, fate: unknown
Chico (M) 1/09, Likati, fate: unknown



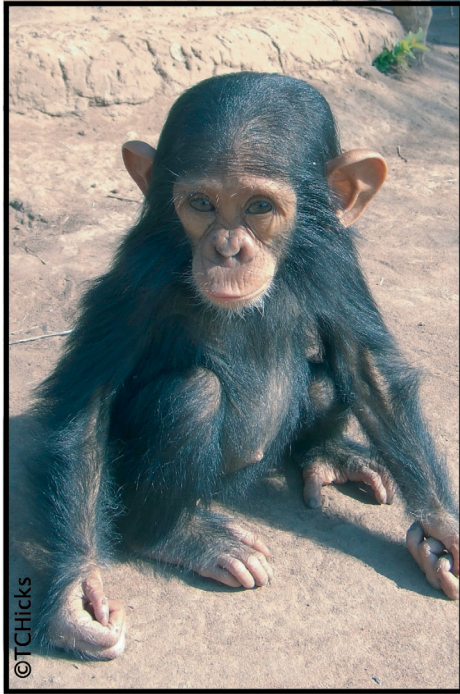
Unnamed (M) 5/08, Bambesa, fate: pet
Unnamed (U) 9/08, Buta, fate: unknown
Unnamed (U) 1/09, Buta, fate: unknown
Djuna (M) 7/08, Aketi, fate: unknown
Zaponé (U) 4/08, Aketi, fate: died

Kathe (F) 1/09, Likati, fate: unknown **Zalko** (M) 1/09, Likati, fate: unknown

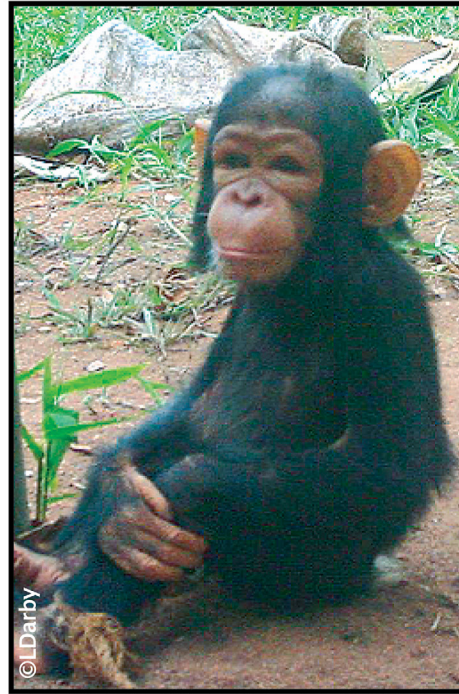
Chico (M), 10/08, Aketi, fate: unknown

Unnamed (U) 1/09, Likati, fate: unknown

Id: Orphans Found North of the Uele River 2004-2009



Unknown
(F), 12/06, Zapay, fate:died



Unknown
(U), 1/09, Bondo, fate:unknown



Between 2004 and 2009 we confirmed 44 orphan chimpanzees being kept as pets and offered for sale in the towns and along the roads to the north and south of the Uele River in the Bili-Buta region of the DRC. 42 of these orphans were recorded south of the Uele River in the Buta - Aketi region between 2007 and 2009

Appendix II Chimpanzee Orphans and Bushmeat, South Uele 2007-2009



a
A chimpanzee orphan from Zobia (near Bambesa) crated together with a baboon, being carried from Buta to Kisangani for sale. The bicycle caravan also carried a heavy load of bushmeat and a goat strapped to the top of the primate crate.

Photograph by Seba Koya in October 2008

Chimpanzee orphan offered for sale in a village between Buta and Bambesa, 2008.

Photograph by TC Hicks

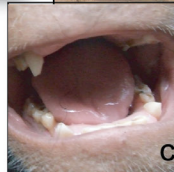


b



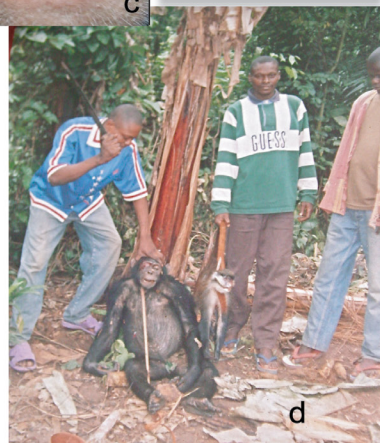
f
Chimpanzee bushmeat sold openly in a Buta (e, below) and an Aketi market (f, above)

Photographs by Seba Koya



c
An orphan whose upper teeth had been extracted with a hot knife in efforts to "domesticate" her.

Photograph by TC Hicks



d

Traveling photographers gave us photos of chimpanzee orphans and carcasses

Photograph courtesy of Laura Darby