

Elephant meat and ivory trade in Central Africa

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Abstract

An assessment of the CITES Monitoring the Illegal Killing of Elephants (MIKE) programme's 2001–2009 carcass database suggested that the trade in elephant meat, especially in the central African sub-region, may be an important factor underlying the illegal killing of elephants. The dynamics, scale and impact of the trade in elephant meat are not well understood and more information is required in order to improve the information in MIKE's database and for the Elephant Trade Information System (ETIS), as well as to assist with the development of appropriate management solutions. In 2010 the IUCN/SSC African Elephant Specialist Group (AfESG) undertook a study on behalf of MIKE to investigate the elephant meat trade as a factor in illegal killing in four Central African countries. The results strongly suggest that elephant meat represents an important incentive for poachers to hunt elephants, but that it is secondary to ivory as a driver of illegal elephant killing. Since the potential income from the meat of a single elephant can exceed that from ivory, however, the elephant meat trade problem needs to be monitored closely and should receive increased attention by range State governments and wildlife conservation organizations.

Key words: elephants, bushmeat, ivory, trade, Central Africa

Résumé

Une analyse de la base de données des carcasses par le Programme de Suivi de l'Abattage Illégal des Éléphants (MIKE) de la CITES entre 2001 et 2009 suggère que le trafic de la viande d'éléphant, en particulier dans la sous-région d'Afrique Centrale, peut être un facteur important qui sous-tend l'abattage illicite des éléphants. La dynamique, l'ampleur et l'impact du trafic de la viande d'éléphant ne sont pas bien compris et il faut de plus amples renseignements afin d'améliorer l'information dans la base de données de MIKE et celle du Système d'Informations sur le Trafic d'Éléphants (ETIS), ainsi que pour aider au développement de solutions de gestion appropriées. En 2010, le Groupe de Spécialistes de l'Éléphant d'Afrique de la CSE de l'IUCN (GSEAF) a entrepris une étude pour le compte de MIKE pour étudier le trafic de la viande d'éléphant comme un facteur du braconnage dans quatre pays d'Afrique centrale. Les résultats suggèrent que la viande d'éléphant représente une motivation importante pour que les braconniers chassent les éléphants, mais c'est une motivation secondaire par rapport à l'ivoire en tant que moteur du braconnage d'éléphants. Cependant, puisque le revenu potentiel de la viande d'un seul éléphant peut excéder celui de l'ivoire, le problème du trafic de la viande d'éléphant doit être étroitement surveillé et doit recevoir plus d'attention de la part des gouvernements des états de l'aire de répartition et des organisations de conservation de la faune.

Introduction

An assessment of the existing CITES Monitoring the Illegal Killing of Elephants (MIKE) programme's 2001–2009 carcass database suggested that the trade in elephant meat, especially in the central African sub-region, may be an important factor underlying the illegal killing of elephants (CITES, 2010; Burn

et al., 2011). The dynamics, scale and impact of the trade in elephant meat are not well understood and more information is required, both to improve information in MIKE and the Elephant Trade Information System (ETIS) and to assist with the development of appropriate management solutions.

In the forested countries of Central Africa, a complex and interconnected variety of development

activities take place such as logging, mining, building of supporting infrastructure (e.g. roads, schools and clinics), which entails the inflow of foreign nationals. Such projects attract an influx of immigrants seeking work, both national and foreign, who depend heavily on bushmeat for protein. With little law enforcement capacity and weak governance structures, there is a very real threat to many local elephant populations.

At present the primary factors and dynamics in the illegal killing of elephants in Central Africa and, in particular, the use of not only ivory but also meat, are assumed but not well understood. A deeper knowledge of the scale and extent of the killing and how the ivory and meat markets are interlinked is urgently needed. Gaining greater understanding of these trade dynamics could help to ascertain the key drivers behind the loss of elephants and other species.

African elephant range States of the Central African sub-region consist of Cameroon, Central African Republic (CAR), Chad, Republic of Congo (ROC), Democratic Republic of Congo (DRC), Equatorial Guinea and Gabon.

CITES–MIKE requested the assistance of the IUCN/SSC African Elephant Specialist Group (AfESG) to implement the ‘Elephant Meat Trade in Central Africa Project’. The overall objective of the project was to enhance knowledge of contemporary elephant meat market dynamics, patterns and trends in Central African countries and assess the importance of meat in relation to other causes—particularly ivory—of illegal elephant killing. The results aim to establish a baseline data set of variables that can subsequently be monitored to assess trends in meat and ivory trade at the site level.

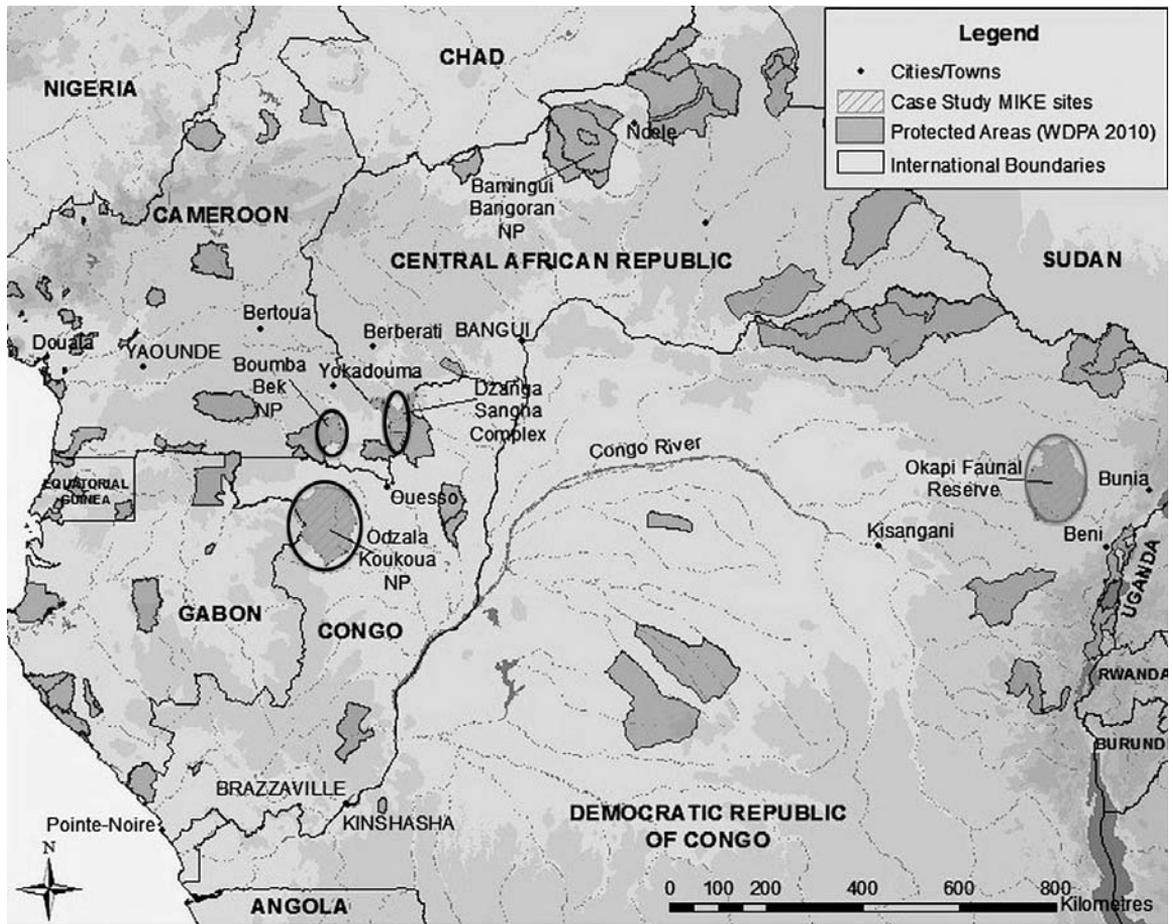


Figure 1. Study areas and MIKE study sites (circled).

The findings of this study also aim to offer contributions to satisfy elements in CITES Decision 13.11 ‘Bushmeat’, Decision 14.78 (Rev. CoP15), which concerns updating information relating to the status of elephant conservation and the data that MIKE is collecting, and Decision 15.74, which is an evaluation of the need to revise CITES Resolution 10.10 (Rev. CoP 15) ‘Trade in Elephant Specimens’.

Methods

Project resources did not allow research to be carried out in all seven countries. Therefore, MIKE monitoring sites in four countries were selected on the basis of number and density of elephants, quality of monitoring data, available institutional support and extent of past bushmeat research to use as supportive data. The sites selected were: Okapi Faunal Reserve (OFR) in DRC, Boumba-Bek National Park (BBNP) in Cameroon, Dzanga-Sangha Complex (DSC) in CAR and Odzala-Koukoua National Park (OKNP) in ROC (Fig. 1).

A methodology was developed to identify and define data variables to collect. Questionnaires were formulated to guide interviews of the principal actors involved in illegal elephant killing and product trading: hunters, middlemen, transporters, vendors and consumers. Data entry sheets were designed to organize and store data (see Stiles 2011a for details).

Investigations were carried out near the MIKE sites on elephant hunting and the products harvested (i.e. meat, tusks, skin, hair, etc.), the quantities transported and sold, the methods and routes taken, actors involved and prices. The meat and ivory commodity chains were followed away from the MIKE sites to regional towns and finally to large cities (Kisangani, Yaoundé, Bangui and Brazzaville). Bushmeat markets and restaurants were surveyed to collect data on elephant meat and when possible ivory workshops and outlets were visited to gather data on ivory trade.

Given the legally sensitive nature of this topic and in an attempt to be a non-threatening observer and participant, the research teams used respondent-driven sampling (RDS) to identify informants, i.e. volunteer populations (Heckathorn, 2002). Through RDS, the research teams recruited hunters, middlemen, transporters, market vendors and consumers as informants. As a result of limited field time (4–6

weeks per country), the number and geographic distribution of informant types in each country were usually not adequate to represent statistically valid samples.

Results

Hunters

All 54 elephant hunters interviewed were commercial hunters, as distinct from subsistence hunters. They hunted for profit, not food (Table 1). Only three (5.6%) of these killed elephants primarily for meat, one each in Cameroon, CAR and DRC (Table 2).

Ivory was the stated primary motivation for 49 (90.7%). Well over half (59.2%) of elephant hunters said they were paid by others to kill elephants (Table 2). These *commanditaires*, influential government or military officers, businessmen or even clerics, order the hunt and provide money, food and other goods to the lead hunter, who organizes the hunting party. They also often supply weapons and ammunition in return for the tusks. The *commanditaires* are not interested in the meat, which is usually a by-product and an added incentive to the hunting party.

The two most common weapons used to hunt elephants are the AK-47 and the 12-gauge shotgun using manufactured bullets, followed by proper hunting rifles (e.g. .458, 10.75). Cable snares and homemade firearms are rarely used.

Elephant hunts entail a much larger expense and work effort than commercial hunting of smaller game or subsistence hunting. Hunting parties are on average larger (mean of 7) and more time is spent on each hunt (mean of 15 days) than hunts involving other targeted game (Table 3). Without the resource input and stimulus from *commanditaires*, it is likely that there would be many fewer elephant hunts, and consequently fewer elephants killed.

In the western Congo Basin, Pygmies are often both elephant hunter and tracker. In the east around OFR, Pygmies only track but do not shoot elephants. Pygmies rarely hunt elephants by themselves, they usually work on behalf of *commanditaires*.

Tusks are always taken from a kill and in 85% of hunts elephant meat was also carried away. However, in three country case studies no meat was carried away in 14%, 25% and 45% of hunts respectively (Table 4). The two main explanations for no meat being

taken were: 1) not enough porters were available to carry meat as well as tusks, or 2) the hunters feared detection and departed quickly after removing the tusks. When meat is taken, it is usually less than half of that available.

Elephant bushmeat is almost always sold smoked. Elephants are most often hunted far from roads, as elephants tend to avoid areas of human activity, and smoking delays spoilage. It takes two to three days to smoke the meat, thus it must be done in a secure location to avoid detection.

In the vicinity of the MIKE sites, elephant meat prices were approximately equal to or somewhat higher than meat from other species. The potential earnings from elephant meat were very high. Prices at the hunter level varied from USD 1 to 5.55/kg, with an average of roughly USD 2.80/kg. The further the distance from the source of the kill, the higher the price for elephant meat and the differential between elephant and other meats increases. In regional towns and large cities elephant meat was often amongst the most expensive meats available, being more expensive than beef, goat and pork (Table 5).

Hunters and *commanditaires* earned considerably more for ivory than for meat per kg. Table 6 shows the prices in three of the countries studied. No hunter ivory prices could be obtained in the CAR.

The economic potential of elephant meat for the hunter often exceeds that of ivory. If all meat could be harvested and sold from an adult male (estimated to equal approximately 1,000 kg smoked) earnings would equal USD 1,000–5,000, with an average of about USD 2,600. Only an elephant with very large tusks (>20 kg each) could provide that much from ivory. On average, hunters could earn much more from meat than from ivory from one elephant.

Many other products are taken from elephants for personal and commercial use: trunk, tail, skin, ears, feet, fat, bone marrow and possibly musth liquid (noted in Cameroon).

The carcass of a single adult elephant with large tusks could potentially earn hunters and/or their *commanditaires* well over USD 10,000. Due to logistical and security constraints, the full potential is rarely achieved.

Table 1. Types of elephant hunters interviewed

Country	Number	Subsistence	Commercial	Full Time	Part Time	Hunting for Self	On command
Cameroon	11	0	11	2	9	1	10
CAR	8	0	8	0	8	4	4
ROC	28	0	28	9	19	17	11
DRC	7	0	7	0	7	0	7
Total	54	0	54	11	43	22	32

Table 2. Hunters' primary motive for killing elephants

Country	A	B	C	D	E	F	G	H
Cameroon		1			8			
CAR		1		3	4			
ROC		0		18	10			
DRC		1			6			
Total		3		21	28			

A - Meat for self, family
 B - Sell meat for self
 C - Sell meat on command
 D - Sell ivory for self

E - Commanded to hunt for ivory
 F - Protect crops, property or life
 G - Cultural reason
 H - Other

Table 3. Sample cases of work effort involved in an elephant hunt*

Country	No. of respondents	Distance travelled (km)	Time on hunt (Days)	No. in party
Cameroon	11	-	8–34 (16)	2–15 (5)
CAR	8	-	10–34 (17)	3–13 (8)
ROC	28	22–100 (53)	2–21 (9)	2–6 (4)
DRC	7	30–262 (116)	3–21 (17)	5–18 (10)

*The mean is in brackets (), rounded off to the nearest whole number.

Table 4. Utilization of meat from recalled elephant kills

Country	A	B	C	D	E
Cameroon	0–12% (2.3%)	0–40% (10%, or ~100 kg)	0%	0–60% (8%, or ~80 kg)	5 (45%)
CAR	2–5% (3.5%)	0–165 kg (85 kg)	0%	0–630 kg (260 kg)	1 (13%)
ROC	~1%	0–10 kg (6 kg)	0%	10–300 kg (100 kg)	0
DRC	~1%	0–315 kg (82 kg)	0%	0–1000 kg (279 kg)	1 (14%)
Mean range	1–3.5%	6–100 kg	0%	80–279 kg	0–5 (0-45%)

A- fresh meat consumed by hunters/shared D- smoked meat sold
 B- smoked meat for personal/shared use E- kills when no meat taken
 C- fresh meat sold

Table 5. Average retail price of wild and domesticated meats, USD/kg

Country	Locality	Elephant	Duiker	Monkey	Beef	Chicken	Fish
Cameroon	Near MIKE site	3.33–6	1	1.50	-	-	-
	Regional town	7.67–10	2.25–3	3.25–4.50	3.90–4.40	6.67–8	1.80–2
	Large city	7.50–13	3.20	5	5.29	5.36–8	1.60
CAR	Near MIKE site	2.97	2.79	3.21	-	-	-
	Regional town	2.93*	3.26	3.13	-	-	-
	Large city	6.94	4.43	4.67	3.34	5	-
DRC	Near MIKE site	5	2.20	2.20	-	-	1.50
	Regional town	-	3	2.50	-	-	2.08
	Large city	5.50	2.02	3.36	6	3.60	4.95

* In 2004, Rieu (2005) documented an average price of USD 4.83/kg for smoked elephant meat and USD 4.08/kg for elephant trunk in Berberati (at 1 USD = 540 XAF (Central African CFA Franc)).

Table 6. Hunter prices for tusks (USD)

Locality	<5 kg		5–10 kg		10–20 kg	
	Range	Mean	Range	Mean	Range	Mean
BBNP	-	26	-	26	30–36	32
OKNP	5–24	12	10–40	20	20–40	31
OFR	5–30	16	15–30	29	25–80	56

Middlemen/Transporters

Meat middlemen are often women; among the interviewees of the study, 17 were female and 12 were male. Although the primary purpose of an elephant hunt is generally ivory, when bushmeat traders become aware of an expedition being mounted they might visit the hunting camp to buy meat, or encounter the party upon its return at a road or in a village to make a purchase. Elephant meat disperses quickly to several middlemen, who take it to sell in local or regional markets and restaurants using a variety of transport such as motorbike, rented car or public transport.

Middlemen convey relatively small amounts of elephant meat the long distance to large cities, as other varieties of bushmeat are plentiful, and transporting illegal elephant meat poses a risk. Authorities rarely seize the meat, as the middleman simply pays a small bribe to carry on. Middlemen sometimes pay transporters—such as logging trucks, buses, commercial vehicles and even government or NGO vehicles—to carry meat to urban markets. Selling prices of elephant meat among middlemen ranged from USD 3.20–4/kg in Cameroon, USD 3.33–6.67/kg in CAR, USD 2.40–6/kg in ROC and USD 2.60–5/kg in DRC. Prices varied depending on the distance from the source and whether the middlemen sold wholesale to vendors or directly to consumers.

Those who command ivory hunts resell the tusks usually to international traders, who export the tusks, or they resell to ivory workshops. Larger tusks are exported while smaller, poorer quality tusks sell for local use. Tusks were exported to West Africa (Nigeria, Ivory Coast and Senegal), Sudan, and Egypt or to Kampala, Nairobi or Addis Ababa for transit to the East Asia.

Middleman ivory selling prices varied from USD 25–70/kg for <5 kg tusks, USD 40–100/kg for 10–20 kg tusks and USD 50 to more than USD 120/kg for

>20 kg tusks (Table 7). Some craftsmen in Kisangani reported prices as high as USD 250/kg, which could not be verified.

Trade paths for elephant meat and ivory diverge and have different commodity chains following the hunter or the first middleman. Fewer than 10% of middlemen traded in both meat and ivory, all of them women.

Table 7. Prices that middlemen received for ivory (USD/kg)

Location	<10 kg	10–20 kg	>20 kg
Yaoundé, Cameroon	40	40–50	50–100
CAR*	<30	>35	-
Kisangani, DRC	30–70	80–100	>120

* No prices were obtained in ROC.

Vendors

Bushmeat vendors are usually women, with 49 interviewed, along with 13 men. Elephant meat is generally sold clandestinely in markets cut up into small pieces or in restaurants to known customers. It is also sold directly to ‘subscribers’ from the vendor’s home. Elephant meat was rarely seen in markets and restaurants relative to other types of bushmeat.

Market retail prices for smoked elephant meat varied from USD 2.93/kg to USD 13/kg, depending on the type of outlet, with the average being approximately USD 6.65/kg. Except in south-west CAR, it was usually the highest or amongst the highest priced meat seen (Table 5). Elephant meat in south-west CAR averaged USD 2.93/kg in 2010, down from an average of USD 4.83/kg documented in 2004 (Rieu, 2005). The drop in price in 2010 was probably a result of the market being flooded with elephant meat due to Sudanese poachers (Anon., 2011).

The term ‘ivory vendor’ refers to those who sell

worked ivory in retail outlets, which can be as informal as a pavement display to as upmarket as a luxury hotel boutique. Most worked ivory in Central Africa is sold in large crafts markets. Raw ivory is not normally sold openly in retail outlets because law enforcement officials in Central African countries pay much more attention to unworked tusks than to worked pieces. Tusks are traded in concealed environments. The degree to which worked ivory is displayed varies from country to country, depending on recent law enforcement efforts. Ivory vendors were investigated in Cameroon, ROC and DRC in this study, but not in CAR due to time constraints.

Ivory displayed openly was rare in Yaoundé, Douala, Pointe-Noire and Brazzaville, where anti-trade enforcement has been effective in recent years (LAGA, 2010). The number of ivory carvers, outlets selling ivory and number of items on offer had dropped markedly from earlier ivory surveys (Martin & Stiles, 2000; Madzou & Moukassa, 1996; Nishihara, 2003). Ivory was openly displayed in Kisangani (Stiles, 2011b) and Kinshasa (Milliken et al., 2009) in DRC.

The most significant trend in the ivory trade industry, inferred from interviews, was the shift away from the local working of tusks to their export to East Asia. The number of East Asian businessmen, construction workers and diplomats has been rising in Africa. According to ivory craftsmen and vendors, most of the larger, quality tusks are purchased by East Asians and exported, while only smaller tusks are available locally for working, at ever increasing prices.

External Factors

Based on observations and informants' responses, weak law enforcement, corrupt government and military officials combined with lack of means of earning a livelihood are critical causal factors in elephant poaching, as well as other forms of natural resource over-exploitation.

Most informants in this study cited abuses or collusion by authorities in illegal wildlife exploitation activities. They expressed dissatisfaction in the way natural resources were managed. Poverty and a lack of alternative sources of income were cited as primary motivations for illegal hunting and product trafficking.

Forestry concessions were an indirect causal

factor in elephant killing. The three MIKE case study sites in the western Congo Basin are virtually surrounded by forestry concessions, with consequent construction of logging roads, other infrastructure, truck transport, the promotion of bushmeat hunting by truck drivers and the influx of immigrants in search of employment, all of which creates a demand for bushmeat. Those without jobs are attracted to poaching for meat, ivory and other trade products. Immigrant shop owners finance ivory poaching and buy tusks. The OFR is not affected by forestry concessions.

Other studies have shown that governments and NGOs, collaborating with logging companies, can yield positive results when working to implement Forest Stewardship Council guidelines. A good example of implementation of the FSC guidelines is the Buffer Zone Project (BZP) in northern ROC that has co-operated since 1999 with the *Congolaise Industrielle des Bois* logging company, WCS and the Congolese Ministry of Forestry Economy (Poulsen, 2009; Mockrin et al., 2011).

Mining is currently a minor causal factor around the western MIKE sites, attracting illegal artisanal miners near DSC and BBNP. Large mining developments are underway that will have a major impact on the entire western Congo Basin sub-region over the next two decades (WWF-CARPO 2009). Illegal mining has been taking place inside the OFR for almost 20 years, but it does not appear to stimulate elephant poaching, although miners purchase elephant bushmeat for consumption.

The recent upgrading of public roads in the Cameroon, ROC and DRC study areas has promoted elephant killing by facilitating transport of illegal products.

Human population growth around protected areas is a major negative factor, as a growing population raises demand for bushmeat and the greater number of destitute people living near protected areas increases the number of those who will poach to survive.

Linked to population growth is the increasing conflict between humans and elephants as people expand into elephant habitats in search of new agricultural land and forest resources. In some areas outside of PAs, the number of 'problem' elephants killed represents a considerable proportion of deaths from all causes. There are two main circumstances of legally killed elephants due to human-elephant conflict. The first is 'problem animal control' (PAC),

which is carried out by the wildlife authorities in response to complaints by villagers of crop-raiding or other elephant depredations. The second is self-defence, in which local inhabitants kill a problem elephant that is threatening their lives and/or property. Meat from legitimate HEC killings does not appear to enter bushmeat trade networks, although research is needed on the question.

Forest and natural resource governance and management are at the heart of all of the problems facing elephants and biodiversity in general. Each case study country has forestry laws that provide the legal framework for managing forest resources, including elephants. These operate in tandem—and sometimes in conflict—with traditional land tenure rules, which are usually based on kinship networks and relationships. Laws are in transition in most Central African countries as legislation is under review, influenced by current conservation initiatives. The Commission of Ministers in Charge of Forests in Central Africa (COMIFAC) has emerged as a strong centralizing institution to gather together all of the various international, national and NGO forest conservation programmes under one umbrella. The Congo Basin Forest Partnership (CBFP) acts as a facilitator to promote cooperation between the various COMIFAC participants to implement forest governance guidelines established by COMIFAC's Convergence Plan.

Forest zoning and land-use in Central African countries are complex, with many categories and applicable laws. Large tracts of forest land are increasingly being turned over by governments to foreign private enterprises for natural resource exploitation. The fact that the legal and economic circumstances are not always well comprehended by all parties is a problem that needs to be addressed by comprehensive legislation reform (Karsenty, 2010).

The main strategy of the CBFP partners to achieve good forest governance involves defining large-scale landscapes in which to implement land use planning. There are currently 12 landscapes in the Congo Basin covering 839,128 km². Planning at the landscape level defines different types of land-use zones: protected areas (PAs) whose main purpose is the conservation of natural resources; community-based natural resource management (CBNRM) areas where communities have some form of natural resources use rights; and extractive resource zones (ERZ), which include forest

concessions, large-scale private plantations, mines, safari hunting zones, and energy and transportation infrastructure. Each of the MIKE study sites belongs to a CBFP landscape, but the land-use zoning and planning are still in an early phase (de Wasseige et al., 2009; ECODIT, 2010). PAs are managed largely by government wildlife and forests agencies, CBNRM areas are (or in principle will be) managed by local community organizations; private-sector companies operating in ERZs are subject to management plans that they formulate following government guidelines and laws. If the COMIFAC plan implemented by the CBFP partners succeeds, natural resource management should improve considerably and devolve management responsibilities historically held by the State on to local communities in the CBNRM zones and to private enterprise in the ERZs.

Good forest governance depends on national governance, rule of law, control of corruption and law enforcement effectiveness. Recent measures of these variables made by the World Bank (2010) indicate that Central African countries are seriously deficient in all of them.

Conclusions

Hunters that specialize in elephants are commercial hunters who primarily target ivory. They often work on behalf of wealthy *commanditaires* who subsidize elephant hunts with weapons, ammunition and supplies in exchange for tusks. Meat is an important by-product of these hunts, along with other parts from the elephant, and these non-ivory products are often part of the incentive for hunters and porters to participate in arduous elephant hunts. Such hunts tend to involve more work effort than subsistence hunts; elephant hunting parties are larger, travel longer distances and last longer than subsistence hunts. Illegal killing for ivory and meat are closely linked, but ivory is more often the primary motivation because *commanditaires* subsidize the hunts in exchange for tusks, which require less manpower to transport and by unit weight, they provide a much higher return.

Elite urban consumers prize elephant meat for cultural reasons and they are willing to pay higher prices for it than for almost any other kind of meat. The main reason more elephant meat is not consumed is its scarcity. Although elephant meat has significant

economic potential for hunters, the commodity is underutilized because of manpower constraints in transport and fear of being detected by the authorities if hunting parties are too large or remain for too long in one place smoking meat.

Since demand for elephant meat exceeds supply, there is great potential for the trade to grow, particularly as other kinds of bushmeat become scarcer as a result of overexploitation propelled by human population growth and a lack of protein alternatives. The trade would almost certainly increase if logistical constraints were eased (e.g. roads were built offering easier access and exodus) and/or security concerns lessened (e.g. eco-guard patrols and road check points decreased, or increase in corruption of law enforcers).

Recommendations

Recommendations for policy and actions to reduce illegal elephant killing emerging from this study include:

1. Leverage the COMIFAC –CBFP strategy of focusing on defined landscapes and creating land-use zones and natural resource management plans to constitute the framework for policies and actions aimed at conserving elephants.
2. Transfer, whenever possible, access, user rights and the responsibility to sustainably manage wildlife resources to local stakeholders who have a vested interest in maintaining the resources and who can deliver solutions at the local level. Strengthen the capacity of these empowered local communities to ensure that they have the ability to exercise these rights responsibly and with accountability.
3. Incorporate traditional knowledge into management and monitoring systems in order to enhance conservation and sustainable use of wildlife resources.
4. Make special efforts to provide education, training and employment for hunters as an incentive to cease killing elephants. Commercial hunters are the proximate cause of elephant poaching in Central Africa and according to them they would cease killing elephants if alternative sources of income were available to them. Elephant hunters are often known within their communities and to local law enforcement authorities. Concurrently, laws must also be more strictly enforced to arrest and punish hunters to deter illegal elephant killing.
5. The relevant authorities, assisted by NGOs (e.g. LAGA, PALF), need to do more to identify these *commanditaires* and middlemen and put a stop to their operations by publicizing their activities and taking them to court. *Commanditaires* and middlemen trading in elephant meat and ivory are intermediate causes of illegal elephant killing. Without their participation and often encouragement in killing elephants and rewarding hunters, elephant poaching would probably decline significantly.
6. Consumers that purchase elephant meat in Central Africa and worked ivory of illegal origin anywhere in the world are the ultimate cause of illegal killing of elephants, as they create the demand that economic motivation must supply. Therefore, education and public awareness programmes should be increased to create public consensus of the need to conserve elephants and also to generate stigma associated with buying elephant products.
7. The international community should sustain its efforts to encourage governments in Central Africa and elsewhere to practice good governance and effective rule of law and such efforts should even be intensified.
8. It is crucial to maintain large protected areas in Central Africa for elephant and other biodiversity conservation. Governments and international donors should consider establishing buffer zones around protected areas in which transportation and communications infrastructure will not be introduced. A real dilemma is the paradox created by, on the one hand, the need for economic development to decrease rural populations' dependence on natural resources for survival and, on the other hand, the consequences of increased economic activity, which brings larger populations with increased means to impact negatively on biodiversity, including elephants. Development should therefore go hand-in-hand with effective conservation policy and actions.
9. Forest eco-guards should secure protected areas and the paths leading to forest clearings in which elephants and other protected species such as great apes congregate. If located in State forests, forestry concessions or communal lands, buffer

- zones should be created around them in which no human activities are allowed.
10. Governments and NGOs need to work with the private sector to promote best-use practices and the establishment of company regulations that promote sustainable forestry management under the Forest Stewardship Council where extractive industries—such as oil, logging or mining—operate. Bushmeat to feed workers must be forbidden and company vehicles must be prohibited from transporting wildlife products.
 11. Strengthen national wildlife management agencies (e.g. MINFOF, ICCN). Also, properly train and equip field officers to allow them to carry out their duties. Staff should be recompensed appropriately and in a timely fashion in order to incentivize, build morale and provide encouragement to carry out their duties.
 12. Improve law enforcement monitoring within national wildlife management agencies in order to evaluate their effectiveness and take remedial measures where necessary.
 13. National governments and international donors should provide resources to permit comprehensive elephant censuses and monitoring programmes to be carried out in co-operation with national wildlife agencies and international organizations such as MIKE, WWF, WCS and the ECOFAC programme.
 14. An elephant meat and ivory trade monitoring programme at the site level should be initiated under the auspices of CITES–MIKE and in collaboration with the IUCN/SSC AfESG and TRAFFIC.

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