Elephant Meat Trade in Central Africa

Republic of Congo Case Study

Stéphanie Latour and Daniel Stiles

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The group meets approximately every one to two years to review status and trends of elephant populations and to discuss progress in specific areas related to conservation of the species. Since it was first convened in the mid 1970's, the AfESG has considerably grown in size and complexity. The AfESG Secretariat, based in Nairobi (Kenya), houses full-time staff to facilitate the work of the group and to better serve the members' needs.

The challenge of the group is to find workable solutions to country and regional problems in an open-minded atmosphere devoid of deliberate controversies. To meet this challenge, the AfESG has provided technical expertise and advice by helping to facilitate the development of national and sub-regional conservation strategies.The group has helped in the development of the Convention on International Trade in Endangered Species (CITES) system for monitoring the illegal killing of elephants (MIKE).

In addition, the AfESG has assisted in the organisation, facilitation and technical preparation of the Range States Dialogue process and more recently, the annual African Elephant meetings together with the CITES secretariat. This process has been instrumental in moving towards regional consensus on controversial elephant issues.

CITES MIKE
Monitoring the Illegal Killing of Elephants (MIKE) is a programme established by a resolution of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

MIKE is a monitoring system put in place across the entire range of the African and Asian elephants to provide information needed for elephant range States to make appropriate management and enforcement decisions, and to build institutional capacity within the range States for the long-term management of their elephant populations.

It is also intended that this monitoring system would assist the dialogue among Parties and facilitate the decision-making by the Conference of the Parties regarding the protected status of elephants by providing reliable information on levels and trends in the illegal hunting of elephants; to determine changes in these trends over time; and to determine the factors associated with such changes and to assess to what extent observed trends are related to CITES changes in listings or ivory trade resumptions.

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Cover photo: Steven Blake. Huge tuskers are now rare in Central Africa.

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Acronyms

BZV	Brazzaville
CARPE	Central African Regional Program for the Environment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNIAF	*Centre National d'Inventaire d'Aménagement de la Flore et de la Faune* (National Centre for Inventory Management of Flora and Fauna)
DRC	Democratic Republic of Congo
ECOFAC	*Conservation et utilisation rationnelle des Ecosystèmes Forestiers d'Afrique Centrale* (Conservation and Rational Utilization of Forest Ecosystems in Central Africa)
FCFA	Franc de Coopération financière en Afrique Centrale (Financial Cooperation in Central Africa franc)
GIS	Geographic Information System
IFO	*Industrie Forestière d'Ouesso* (Forest Industry of Ouesso)
INCEF	International Conservation and Education Fund
IUCN	International Union for Conservation of Nature
MDDEFE	*Ministère du Développement Durable, de l'Economie Forestière et de l'Environnement* (Ministry of Sustainable Development, Economy and Environment)
MIKE	Monitoring the Illegal Killing of Elephants
NGO	Non-Governmental Organization
NP	National Park
OKNP	Odzala-Koukoua National Park
PA	Protected area
PALF	*Projet d'aide à l'Application des Lois sur la Faune* (Project to assist Application of Wildlife Laws)
PROGEP	*Projet de Gestion des Ecosytèmes Périphériques* (Project for Ecosystem Management in Periphery Areas) of WCS
RA	Research Assistant
SOCALIB	*Société Congolaise Arabe Libyenne de Bois* (Congolese-Libyan Arab Timber Company)
TRIDOM	Tri Dja-Odzala-Minkebe (WWF conservation project)
UFA	*Unité Forestière d'Aménagement* (Forest Management Unit)
WCS	Wildlife Conservation Society
WWF	Worldwide Fund for Nature and World Wildlife Fund (USA/Canada)

Acknowledgements

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Finally, many thanks to all the research assistants in Brazzaville, Ouesso and Pointe-Noire for their excellent work.

Introduction

Background

Hunting of wild animals is an important component of household economies in the Republic of Congo (ROC), as in neighbouring countries. Many socio-economic studies show that bushmeat remains the primary source of protein for most of the rural families and that hunting can constitute a significant source of revenue for forest people (Wilkie & Carpenter, 1999; Fa & Brown, 2009). Bushmeat consumption by low density populations living in the forest may be sustainable, but a growing demand from urban consumers – facilitated by the upgrading of roads – has created an important market that can lead to unsustainable levels of bushmeat offtake. Large mammals with low reproductive rates like elephants are more susceptible to being over-exploited compared to smaller species that can tolerate intensive hunting (Blake, et al., 2007).

An initial assessment of the existing Convention on International Trade in Endangered Species - Monitoring the Illegal Killing of Elephants (CITES-MIKE) programme's carcass database, pertaining to information collected between 2001 and 2009, indicates that the trade in elephant meat, especially in the Central African subregion, may be an important factor underlying the illegal killing of elephants (CITES, 2010). The dynamics, scale and impact of the trade in elephant meat are not well understood and more information is required, both to improve the information in MIKE and the Elephant Trade Information System (ETIS) and to assist with the development of appropriate management solutions.

The IUCN/SSC African Elephant Specialist Group (AfESG) has been charged by MIKE with implementing a project to investigate the linkages between the elephant meat trade and larger social and economic dynamics at play, including, but not limited to, ivory trade, logging (legal and illegal), mining, infrastructure development, global economic trends, law enforcement at the national and international level, and community forest governance.

This report presents the results of a pilot project carried out in ROC to assess the importance of elephant bushmeat as a causative factor in the illegal killing of elephants.

Objectives of the Study

The overall objectives of the study were:

- to better understand the dynamics, scale and impact of the elephant meat trade in the ROC, focusing on Odzala-Koukoua National Park as a case study source area.
- to examine the trade in elephant meat and ivory as a factor in illegal killing of elephants.
- to have a better insight into levels of elephant meat trade and consumption at the site, city, and regional level.

Specific objectives were to determine:

- those involved in killing elephants for meat and ivory respectively;
- the methods and work effort of those involved;
- the source locations, transport methods and routes used for trafficking meat and ivory;
- the final destination of meat and ivory and identification of the consumers;
- the commodity chain of meat and ivory respectively and the social networks involved;
- the economics of the trade: prices for meat and ivory;
- attitudes and motivation related to killing elephants of those involved in the trade: the hunters, transporters/middlemen, vendors and consumers;
- the relationship and functioning of elephant meat trade within the broader context of bushmeat trade in general;
- the influence of external factors on the killing of elephants and trade in their products, for example, logging (legal and illegal); mining; infrastructure development; law enforcement at the national and international level; community forest governance; and economic trends that affect demand.

New data were required, which this study aimed to collect, and an analysis of research already undertaken relating to elephant poaching and bushmeat trade by relevant institutions was carried out.

Study Sites

Odzala-Koukoua National Park

Odzala-Koukoua National Park (OKNP) is located north of the equator in the Republic of Congo (0°09'-1°35'N, 14°18'-15°21'E) spanning two provinces: Sangha and Cuvette Ouest (West Basin) (**Figure 1**). Created in 1935 with a surface area of 2,850 km2, the park was extended to 13,545 km2 in 2001, being by far the largest national park (NP) in ROC and the third largest forested NP in Central Africa after Salonga and Okapi NPs in DRC.

The northern boundary of the OKNP is delimited by the main road connecting two district towns, Mokeko (25 km south of Ouesso) and Sembé, along which there are 13 villages, eight of them with a population of over 100 inhabitants (Victor Mbolo, WWF, pers. comm., 2010). The eastern border goes south towards Etoumbi running alongside the national road (RN) 2 for about 55 km from Mokouangonda to Epouma (seven villages). At Mokouangonda, the RN 2 diverges to the north-east away from the OKNP, rendering the north-eastern boundary of the OKNP inaccessible by motor vehicles. The recent renovation of the RN 2 makes access to the OKNP area easier and makes it possible to reach Ouesso from Brazzaville in one day, even with a public bus.

The south-western boundary of the NP follows a secondary road connecting Ebana to Mbomo, which continues to Oloba on the Gabonese border. From Mbomo to Oloba the road is no longer suitable for motor vehicles (**Figure 2**).

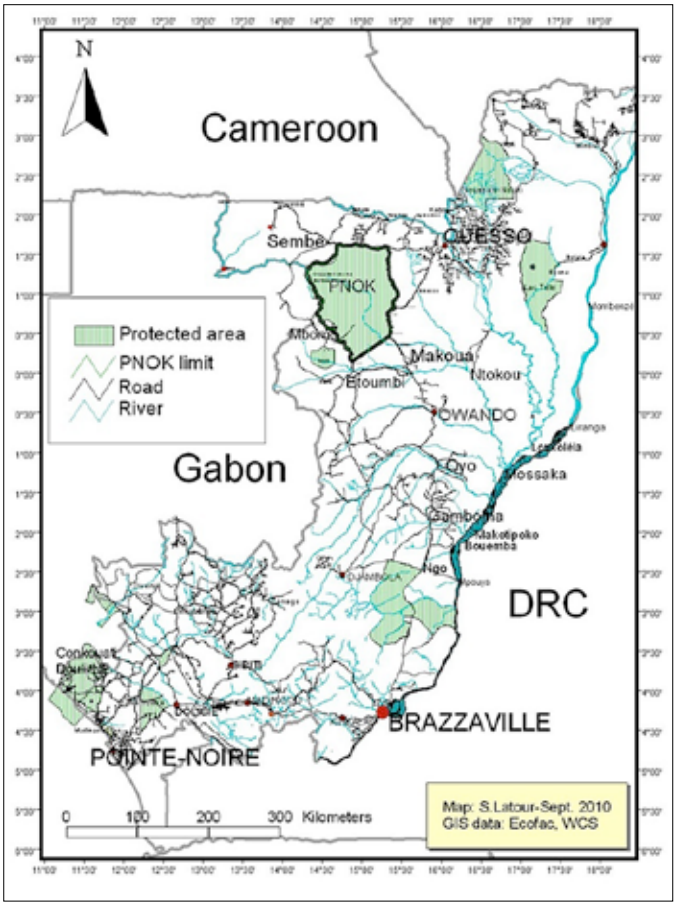
Human populations

South of the OKNP, Mbomo District, along with the whole of forested northern ROC, has a low population density of approximately 0.5 inhab/km^2. The population has grown from 4,541 in the 1987 national census to 7,163 in 2010. The population of Cuvette-Ouest in total was listed at 72,999 in 2010 (ROC National Census, 2010). Four ethnic groups are represented: the Mboko, the Kota, the Mongom and the Bakola. They are slash and burn farmers and hunters, except the Bakola Pygmies, who are hunter-gatherers.

On the eastern border, the population of the villages from Epouma to Mokouangonda (on the OKNP boundary) on the RN 2 was only 283 in 2006 and probably is not much

Forest elephants in northern ROC (Photo: Richard Malonga, WCS)

Figure 1. Congo map and study area. PNOK is Odzala-Koukoua NP



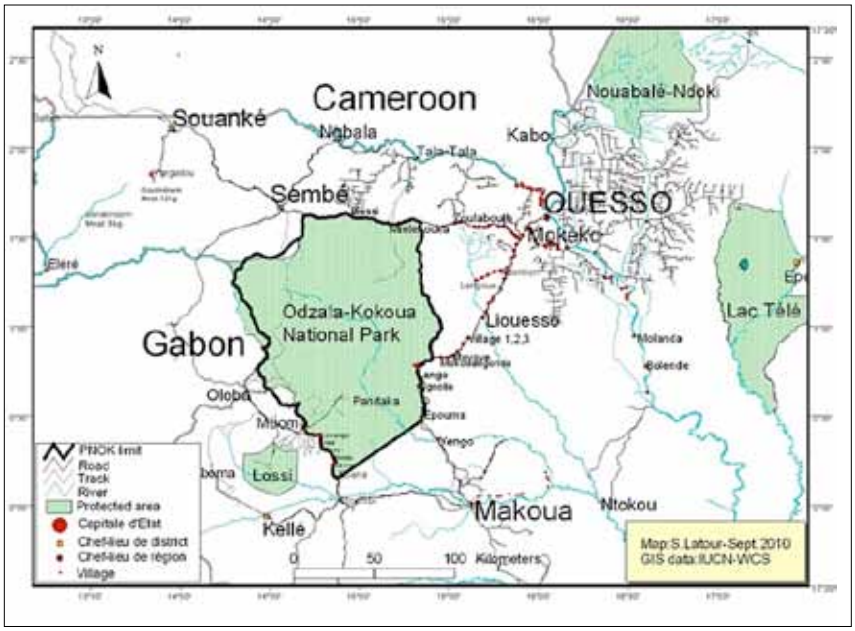
more now (Elende & Zoubabela, 2006). About 30 different ethnic groups were enumerated on the Yengo-Liouesso main road including the Mikaya, Bonguili, Bakota, Bokiba and the Ngombe while the Bakwele constituted the majority (Elende & Zoubabela, 2006). This population is divided into three different categories by the authors: farmers, hunters and unemployed. There is no alternative economic activity in this area.

The main villages on the northern border of the OKNP are Miélékouka and Biessi. The main road where they are located is passable towards Mokeko and Ouesso but is very difficult towards Sembé. The dominant ethnic group is Bakwele. Unlike in other areas around the OKNP, there is a tradition of cocoa growing in Sembé and Souanké districts, initiated by the Djem of Cameroon, which became productive in the 1950s (Guillot, 1977; Robineau, 1987). The current production is lower than before, but cocoa is still bought by Cameroonian traders and exported to Cameroon. The road from Sembé to Cameroon was opened in 2007 and thus accessibility and trade has improved.

Biological characteristics

The whole northern ROC region lies in the Guineo-Congolian/Soudanian transition area (Dowsett-Lemaire, 1995a). The semi-

Figure 2. Odzala-Koukoua NP



deciduous forests of the OKNP are typical of most of the Guineo-Congolian forest, which is a mixed moist semi-evergreen Guineo-Congolian rainforest as classified by White (1983). It extends from south-eastern Cameroon and eastern Gabon and includes the whole of the Congo Basin. The OKNP is a mix of several relatively heterogeneous vegetation types. In the north there is a tropical moist forest, while to the south lies a zone of forest-savannah mosaic with gallery forests running along watercourses. Along the rivers are inundated forests with extensive swamp forests associated with the Mambili River floodplain. These inundated areas are also found in the north-west, where swamps and seasonally flooded forests are the dominant vegetation types (Maisels, 1996). The OKNP contains wide areas of *Marantaceae* forest which are characterized by sparse tree cover and a dense layer of understorey herbs of *Marantaceae* and *Zingiberaceae* (Lejoly, 1996). The OKNP is also characterized by the presence of over one hundred forest clearings ranging in size from less than 0.5 ha to over 10 ha. These clearings, rich in minerals, called *bais*, are dominated by grasses and herbs of the *Graminae* and *Cyperaceae* families and they attract high densities of large mammals, particularly elephants and gorillas. Forest paths have been created and are used repeatedly by elephants, particularly in the *Marantaceae* forests (Vanleeuwe & Gautier-Hion, 1998).

The OKNP has a noteworthy mix of true forest species and savannah species. The mammals to be found include the following: forest elephant, forest buffalo, hippopotamus, bongo, sitatunga, bushbuck, Bates pygmy antelope, eight species of duiker (including Grimm's duiker and Ogilby's duiker), giant forest hog, red river hog, western lowland gorilla, chimpanzee, eight species of monkey, leopard, golden cat and spotted hyena. The bird community is diverse, with around 435 species in both the savannah and forest habitats contributing to the biodiversity (Dowsett-Lemaire, 1995b). Of the larger reptiles, two crocodile species are known to exist in the OKNP, with the presence of the Nile crocodile still an open question (Maisels, 1996).

Pertinence as a case study site

The OKNP is located within the largest forested area with the highest hunting pressure in the country. The park is known to contain important populations of large charismatic mammals, and has been managed and surveyed by several conservation and research programmes (ECOFAC, WCS, WWF) and it has been a MIKE monitoring site since 1999 providing relatively high quality Proportion of Illegally Killed Elephants (PIKE) data (CITES, 2010). The accumulated data render the NP a valuable site to study as a source of trade products from illegally killed elephants.

Since 1992, ECOFAC (Conservation and Rational Utilization of Forest Ecosystems in Central Africa) – a EU funded project – has carried out a conservation and development programme in the OKNP collecting data on elephant poaching and the ivory trade (Nishihara, 2003). Research and monitoring in the OKNP over the last two decades have demonstrated that the park contains an extraordinary abundance of forest elephants (Fay and Agnagna, 1991; Maisels, 1996; Vanleeuwe, et al., 1997; Vanleeuwe & Gautier-Hion, 1998; Querouil, et al., 1999; Blake, 2006a). Due to an excellent habitat with a profusion of *bais*, and a high degree of isolation in the interior of the park, the OKNP contains very high densities of elephants compared to other sites in Central Africa. Elephants are found in large part far from human activity along the river valleys. Between 2000 and 2008, the total number of elephants in the OKNP was estimated to be between 13,545 and 21,760 (Hart & Beyers, 2002; Blake; 2006a; Malonga, et al., 2009), while a further 13,260 elephants were estimated to inhabit the Forestry Management Unit of Ngombé, located contiguously to the east (Kiminou, et al., 2007). **Figure 3** demonstrates that elephants in OKNP tend to concentrate in areas away from human activities.

The OKNP has, however, been under considerable threat from poaching for many years, particularly of elephants to supply the ivory trade (Hecketsweiler, et al., 1991; Nishihara & Kosakosa, 1997; Nishihara 2003).

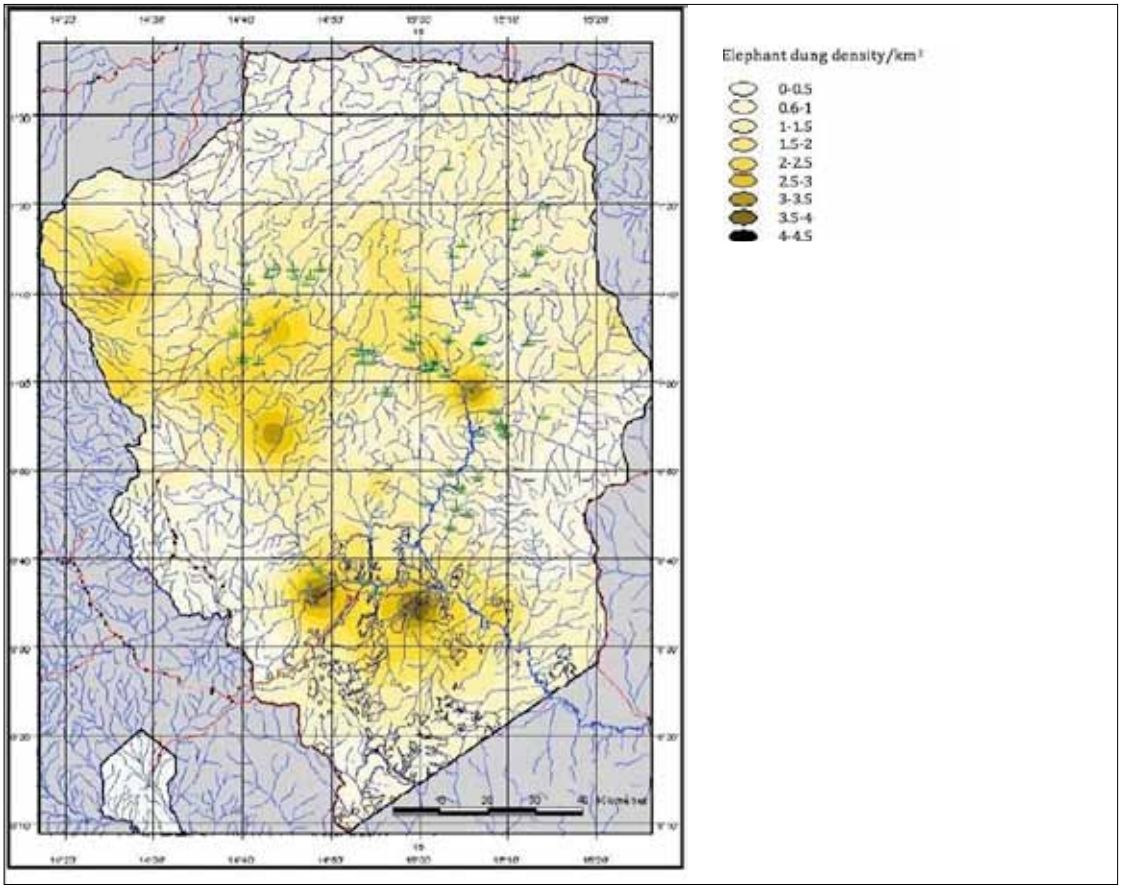
Southern Sector of Odzala-Koukoua National Park

Mbomo was the ECOFAC headquarters until June 2010 when the project closed down. Several ecoguard checkpoints are still operational. They are located in Mbomo, Ebana, Lebango and Mbandza (**Figure 4**) where ecoguards search vehicles for illegal wildlife products.

The data collection took place in villages along the Mbomo-Etoumbi road. Apart from Mbomo, which is the District administrative centre, the villages on this road are sparsely populated and resemble camps. The hunters that specialize in killing elephants are found mostly in Mbomo, Diba and Lisanga. Several of them have already been tried and imprisoned for poaching elephants, but are now back in their villages. The commune of Etoumbi, with numerous unemployed youth who poach in the national park, also represents a serious threat to wildlife.

There are no permanent markets on the RN 2 section that forms a part of the eastern boundary of the southern

Figure 3. Elephant density based on dung counts in OKNP (Source: Blake, 2006a)



part of OKNP from Epouma to Mokouangonda (**Figure 4**). Permanent markets are found in Mokeko to the south of Ouesso and in Ouesso, which is the fifth largest town of the country with about 28,000 inhabitants (**Figure 5)**. All the small villages on this road are potential bushmeat collection points. The villages which are well known for the trade and which are frequented by vendors and middlemen (called *routiers*) include the following:

- Attention (54 km SW of Ouesso) is a village on the national road, which is linked by a bush track to a big hunting and fishing camp at Lengoué.
- Liouesso (80 km SW of Ouesso) is close to the Lengoué River that is used to transport fish and bushmeat, including elephant meat. There are about 72 fishing camps along the river (Auzel, 2008) and hunting camps deeper in the forest. Several clearings (*bais*) frequented by elephants exist in this area. Elephants have been killed in this area for a long time. Their products are sent either to Liouesso (meat) or to Makoua via Ntokou (meat and ivory) by boat. Ntokou is a hot spot for ivory and bushmeat collection, most of it being conveyed to Brazzaville by river. Informants said that Chinese people exploiting a stone quarry for road construction on the Lengoué river, close to Liouesso, hide large quantities of elephant tusks on boats transporting stones to Ntokou and Makoua, but the story could not be verified during this study.
- Mokouangonda (117 km SW from Ouesso) is the last collection point for traders coming from Ouesso.

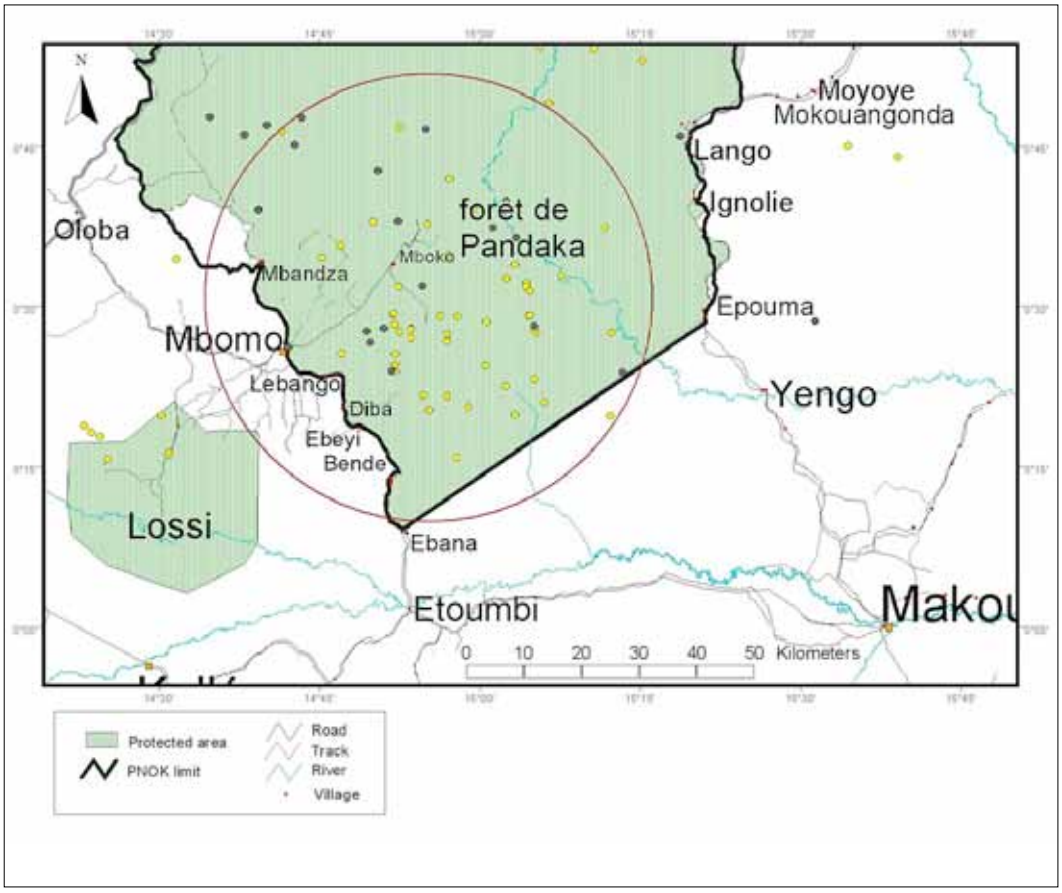
The bushmeat collected is transported by middlemen to Brazzaville and also to Ouesso. Three times a week, cars or small trucks travel from Ouesso to Mokouangonda to collect goods at every collection point.

The eastern side of the OKNP has three ecoguard check points, with four ecoguards each: PK17 (Mokeko), Mokouangonda and Yengo, on the Mambili River. The fact that so much elephant meat and ivory gets through suggests that inspection is not stringent.

Northern sector

WWF-TRIDOM is an international conservation project that operates in an area termed the Congo Interzone Space TRIDOM, which includes five protected areas, Dja,

Figure 4. OKNP Southern Sector



Nki and Boumba-Bek in Cameroon, the northern sector of Odzala in ROC and Minkébé in Gabon. The programme in ROC is based in Sembé and employs 10 guards, while providing support to the operations of 14 other guards (Biessi, Miélékouké), to monitor the Jua-Ikié logging concession and the Gabon and Cameroon border areas (see **Figure 5**). From Souanké to Ngbala on the Ngoko River on the Cameroon border,

OKNP guards, with WWF support, closed down all the hunting camps and evicted the hunters in 2009. Since then, WWF has noticed a return of elephants migrating from the Nki NP in Cameroon (Mbolo, pers. comm., 2010).

Unlike the southern and eastern areas, the northern sector possesses the alternative economic activity of cocoa bean growing. This activity is quite profitable as a worker earns FCFA 5,000/day (US$ 10/day) in a plantation, while the Congolese minimum daily wage is FCFA 2,500 (US$ 5)/day. As a result, during the cocoa harvest time from mid-August to January, men have less time to go hunting and bushmeat quantities decrease in the markets (Mbolo, pers. com, 2010).

The only permanent market is located in Sembé. WWF provides support to the northern sector (up to Miélékouka), while WCS provides support to the eastern sector. Three guard stations exist in the northern sector: Miélékouka with 11 guards, Biessi with four guards and Sembe with 10 guards (see **Figure 6**). The Sembe guards operate mostly in the north-western periphery of OKNP. WWF's programme consists of anti-poaching support, ecological monitoring, creation of protected areas and developing collaboration with the private sector (mining, logging).

Summary of Previous Research on Bushmeat and Ivory Trade in Congo

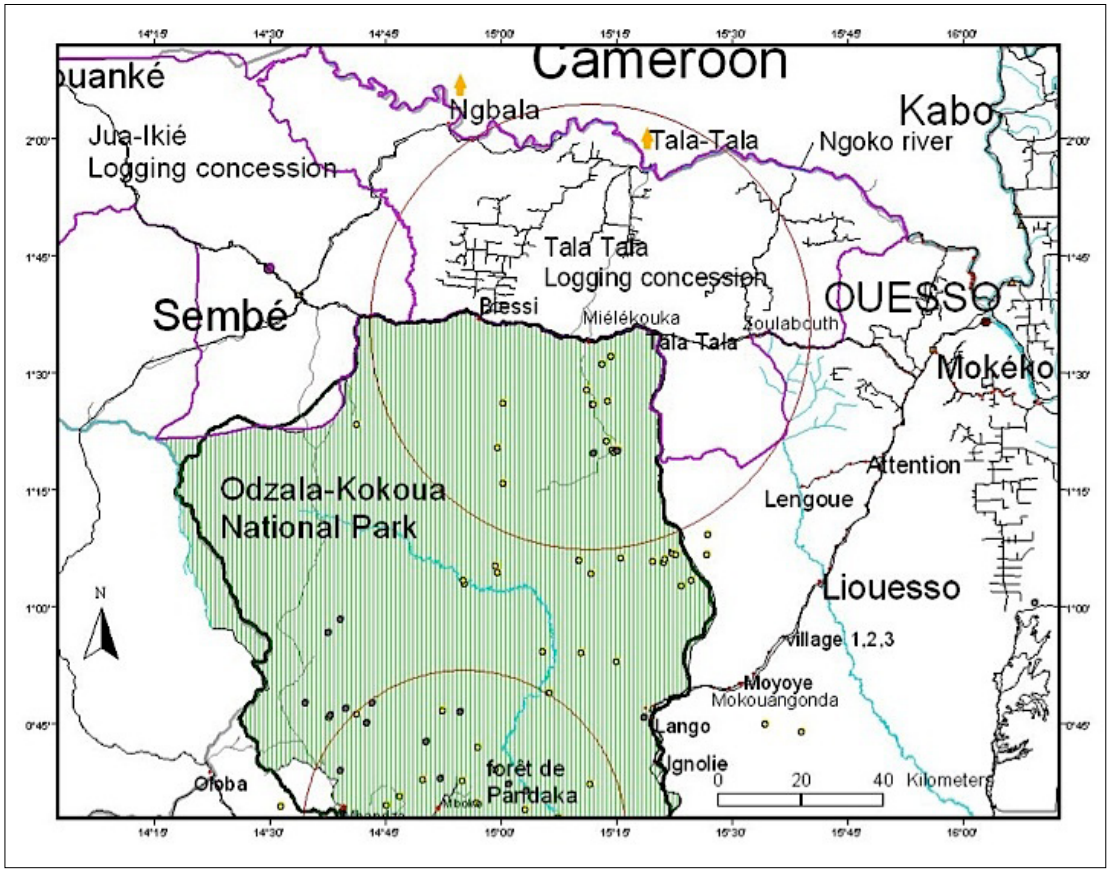
WCS and ECOFAC have undertaken several socio-economic studies to better understand the sustainability

of hunting and the bushmeat and ivory trade and their value in supporting livelihoods. WCS, in the framework of the socio-economic programme, OKNP-PROGEP (*Projet de Gestion des Ecosytèmes Périphérique* or Project for Ecosystem Management in Periphery Areas), is still monitoring the bushmeat flow of six key sites within the Forest Management Unit (UFA) of Ngombé, which is exploited by the Forest Industry of Ouesso (IFO), a logging company adjoining the OKNP. The villages monitored are Liouesso, Molanda, Ngombé site, Zoulabouth and Mokouangonda (see **Figure 5**), which includes an annual survey of local population food habits (Elende, 2009; Elende & Zoubabela, 2006, 2009).

Other studies dealt with bushmeat trade in ROC through a regional approach (e.g. Delvingt, 1997; Wilkie & Carpenter, 1999), while further studies focused on ROC, most of them on the northern part of the country. Wilkie, et al. (1992) in the Sembé-Ouessso area and Blake (1994) in the Kabo forest, noticed that traditional hunting was being abandoned in favour of metal snares and large-bore guns, used mainly by Pygmy hunters after elephants.

Carpaneto (1994) provided much valuable information about semi-traditional elephant hunting (techniques, cultural uses, economics) in the OKNP and in 1995 ECOFAC conducted its first study on local hunting in villages on the edge of the NP, providing quantitative data to assess its intensity, socio-economic contribution and impact on local wildlife (Vanwijnsberghe, 1996). Vanwijnsberghe (1996) reported two main threats to forest elephants: 1) local hunting by villagers with old hunting rifles using assegai spear-tips as projectiles and 2) a more organized hunting method managed by people from Makoua using modern weapons and travelling on the Mambili and Lekoli rivers to transport the meat and ivory. Nevertheless, he concluded that elephant poaching in the area had been considerably reduced in 1995 due to the efforts of ECOFAC's anti-poaching measures, although many hunters confessed they were ready to launch it again if ecoguards ever let up.

Figure 5. Northern OKNP area



A study of the bushmeat trade in Ouesso surveying markets and hunters was carried out in 1994 (Hennessey, 1995; Hennessey & Rogers, 2008). The study found that in 1994 some 20 km^2 of forest around Ouesso had been completely hunted out of large mammals. Bushmeat had to be brought in to market by road and river from surrounding areas. Elephant meat represented a small percentage of the meat sold in Ouesso, but elephant products (meat or tusks) were present in the markets regularly, an average of 3.8 times per week over four months. The study identified transport routes for bushmeat brought in to Ouesso and revealed an obvious lack of effective protection and management of wildlife.

Eves (2006; Eves & Ruggiero, 2000) conducted a socio-economic and hunting economics study in association with WCS in the Nouabalé-Ndoki National Park area of northern ROC in 1995 and 1996. She found that elephant hunting had significant economic potential for villagers. Using semi-structured interviews over four months in 24 villages, she found that 273 elephants had been killed during this period. The number was conservative, as the count included only elephants killed between October 1995 and January 1996 by hunts originating in those villages, not organized outside. Elephants were hunted unselectively, thus return from tusks and meat was highly variable. Distance of a kill from the village was also a factor, as it affected the difficulty of meat transport – the greater the distance, the less meat was carried back. The average profit from an elephant hunt was US$ 400, a considerable sum at that time in northern ROC rural areas. Eves recorded 275 12-gauge shotguns and 66 large-bore rifles used in the hunting. She did not mention if AK-47s were used. If shotguns were the main weapon used to hunt elephants, they must have been using large bullets fashioned from melted shot, as even 00 shot would not kill an elephant. Hunters reported that tusk sizes had been decreasing due to over-exploitation. Pygmies carried out most of the hunting with guns supplied by Bantus. Elephant meat was readily available in Impfondo, Ouesso and Pokola.

Eves (2006) concluded that with the advent of increased logging activities, improved roads and a growing human population, bushmeat hunting would become unsustainable, unless strict legislative, law enforcement and conservation actions were undertaken, along with the development of economic alternatives to hunting.

Studies have also been carried out to monitor hunting and bushmeat trade in logging concessions (Auzel & Wilkie, 2000; Wilkie, et al., 2001; Elkan, et al., 2006; Poulsen, et al., 2007, 2009). Logging activities impact adversely on elephants and other wildlife in several ways: the work camps create demand for bushmeat, logging truck drivers encourage bushmeat hunting as a supplement to their income through participating in transport and marketing and logging roads create access to previously inaccessible forest areas. One six-year study (Poulsen, et al., 2009) covering logging sites in northern ROC found that industrial logging operations led to a 69% increase in the population of logging towns and a 64% increase in bushmeat supply, thereby benefiting immigrants to the detriment of indigenous peoples. Immigrants used primarily wire snares and hunted 72% of the bushmeat harvested. The results suggest that a quite significant threat of logging to biodiversity is the permanent urbanization of frontier forests.

WCS initiated two socio-economic studies on urban trade of hunting products in Brazzaville, one of them on bushmeat (Malonga, 1996), with detailed information about the commodity chain, quantities, species and incomes generated, and one on carved ivory (Madzou & Moukassa, 1996) updated in 1999 (Madzou, 1999). Although ivory trade issues were discussed in most of the papers previously mentioned, a more complete analysis of ivory trafficking in Congo is presented by Nishihara (2003), as well as of elephant hunting in and around northern protected areas, including the OKNP.

The Forestry Industry of Ouesso (IFO) initiated a study of human populations in the Ngombé logging area with one objective being to investigate fish as an alternative to bushmeat in order to reduce hunting in northern ROC (Auzel, 2008). The study found that elephant hunters established hunting camps in the course of their hunting activities and even traded smoked elephant meat with fishermen. Military automatic weapons were used in hunting elephants. Auzel (2008) identified 72 fishing camps along the Lengoué and feeder rivers, 33 of them occupied at the time.

Several reports have been published of elephant and great ape population surveys in the OKNP and adjacent areas within the context of the WWF-TRIDOM and ECOFAC projects, and they provide useful elephant number and density data (Blake, 2006a; Kiminou, et al., 2007; Malonga, et al., 2007, 2009).

On a larger scale, more recently a landscape approach has been applied to examine biodiversity conservation in northern ROC, taking into consideration the sustainability of bushmeat hunting (Poulsen, 2009; Stokes, et al., 2010).

The CITES-MIKE programme has established a series of monitoring sites in most of the African and Asian elephant range States (CITES, 2010). These monitoring sites consist of protected areas (national parks or reserves) in which relatively important elephant subpopulations are found. The overall goal of MIKE is to provide information needed for elephant range States to make appropriate management and enforcement decisions, and to build institutional capacity within the range States for the long-term management of their elephant populations. More specific objectives within this goal are:

- to measure levels and trends in the illegal hunting of elephants;
- to determine changes in these trends over time; and
- to determine the factors causing or associated with such changes, and to try and assess in particular to what extent observed trends are a result of any decisions taken by the Conference of the Parties to CITES.

The main benefits of the programme include a much increased knowledge of elephant numbers and movements and a better understanding of the threats to their survival, as well as an increased general knowledge of other species and their habitats.

Additional outcomes are anticipated as follows:

a) Elephant populations and their ecosystems in Africa are managed in sustainable ways; and
b) Observation reports and data about threatened and endangered species are regularly available in all elephant range States.

MIKE, in cooperation with the Department of Wildlife and Protected Areas of the MDDEFE, has been monitoring the illegal killing of elephants in OKNP since 2003. Between 2003 and the end of 2007, 184 elephant carcasses were reported in the OKNP to MIKE (CITES, 2010). Of these, 56 (30.4%) were thought to have been poached although whether for ivory, meat or both is not known. MIKE does not aim to estimate the total of all illegally killed elephants, but only the Proportion of Illegally Killed Elephants (PIKE) encountered in patrols. OKNP falls below the average PIKE value seen in Africa (CITES, 2010).

National Laws Relevant to Elephant Hunting, and Bushmeat and Ivory Trade

The ROC acceded to CITES on 31 January 1983. Hunting and activities linked to the commercialization and utilization of wild species are regulated by *Law No. 37-2008 of 28 November 2008* on Wildlife and Protected Areas.

Article 24 of this law classifies wild animals in three categories:

- Totally protected species;
- Partially protected species;
- Other species.

Elephants, even though they are classified as a 'Partially protected species', are prohibited from being killed by *Act no. 114-91 of 24 June 1991* and benefit from absolute protection by *Decree No. 32/82 of 18 November 1991*. These legal amendments to totally protect the elephant were made subsequent to CITES having placed the species in Appendix I in 1989 (Meredith, 1989).

Decree 3863 of 18 May 1984, *Article 3* specifies that totally protected species may not be hunted except for scientific purposes, live capture, population control or culling specifically authorized by the Ministry of Water and Forests.

Three exceptions are foreseen by *Law No 37/2008*:

- Exceptions linked to scientific research *(Article 25)*: Except for special permission accorded to holders of a scientific hunting permit by the Ministry of Water and Forests, totally protected animals may not be hunted.
- Exceptions linked to legitimate defence *(Article 65*): No judicial pursuit may be exercised against any person who hunts a wild animal due to legitimate self-defence or defence of another, of one's domesticated animals, fields or other goods.
- Exceptions linked to administrative actions *(Article 66*): The Water and Forests administration can allow techniques and methods to move away, catch or kill wild animals potentially dangerous for human beings or their properties.

<u>Regulations concerning circulation and holding of totally protected wildlife products</u>

Article 27: the import, export, detention and transport of wild animals or their trophies is strictly prohibited throughout the national territory, except for special exceptions from the Ministry of Water and Forests for scientific research or reproduction purposes.

Article 30: the possession and movement of totally protected species, their trophies or their hides are subject to obtaining an Origin Certificate from the Ministry of Water and Forests.

Article 65: if a totally protected animal is killed in self-defence, the trophy (pelt, skin, teeth, tusks, bones, horns, shells, claws, hooves, eggs or feathers) must be turned over to the competent technical service for onward transmission to the General Direction of the Ministry of Water and Forests. The meat should be distributed by the authorities in conformance with local custom.

The infractions and sanctions linked to totally protected species and to elephants

Article 113 outlines sanctions for infractions related to totally protected species, including live animals, their killing and trade of their meat or their trophies. Infractions can be punished by a fine of FCFA 100,000 to 5,000,000 (US$ 200 to 10,000) and/or a punishment of two to five years.

The law also makes provision for aggravating circumstances which increase the penalties if the animal was hunted either with prohibited means, from a motor vehicle, from a plane or a boat, with military weapons, etc.

Article 113 goes even further: the maximum penalties are applied in the following cases:

- The author of the infraction is a government agent;
- The infraction is committed during the closed hunting period;
- The delinquent is a repeat offender.

Protected species cannot be imported or exported. Sport hunting of elephants is prohibited in ROC.

Methods

Personnel

The team leader was Stéphanie Latour. Most of the staff were recruited in Brazzaville, except for three research assistants (RAs) hired in Ouesso. Personnel hired were either recommended by a conservation organization (INCEF, ECOFAC, PALF or WCS) or had already worked with the project consultant on previous assignments. The RAs and their assignments are outlined below.

- One sociologist, Maurice Evoura, was sent to Mbomo, south of the OKNP, to conduct hunter interviews. He was chosen because he is originally from this area and knows personally several famous elephant hunters, some of them being relatives. He could therefore win the hunters' trust quickly.
- One Water and Forests engineer, Chantal Nanitélamio, was first in charge of surveying all the Brazzaville markets, looking for elephant meat sellers and middlemen; then she travelled to the north of the country to investigate the transport routes (roads and rivers) and bushmeat markets.
- Another Water and Forests engineer, Chanelle Louzolo, conducted consumer surveys in all the different Brazzaville districts and visited restaurants that served bushmeat.
- An investigator working for the NGO PALF (*Projet d'Appui à l'Application des Lois sur la Faune* or Project to Support the Application of Wildlife Laws) was sent to Oyo and Mossaka on the Congo River to gather information on bushmeat transportation from the north to Brazzaville.
- Jean-Marie Bimba, a sociologist, was first hired to investigate north of the OKNP on the Ouesso-Sembé main road (hunters and middlemen interviews); then he joined the Brazzaville team to survey restaurants and markets.
- Two members of local conservation NGOs, Enoch Nguerre and Guillaume Meking recommended by WCS, were hired in Ouesso to survey markets and interview hunters.
- For a short mission in Pointe-Noire, two Water and Forests school students were hired to interview consumers: Armel Madou and Gildas Bayonne while two others investigated markets and restaurants: Arlette Tchicaya and Emmanuel Dilambaka.
- Two ECOFAC socio-economists, Aimé Bassouama and Brice Baketiba, who know the OKNP area very well and have worked a lot with local communities were not available to conduct field work, but they were hired for two days to write a report and give their personal insight on elephant poaching and bushmeat trade north and south of the OKNP.

Field work was carried out from 28 June to 15 August 2010. This included in-country organization and preparation.

Data collection methods

Collecting data on elephant killing and trade in bushmeat and ivory is extremely sensitive because these are all illegal activities and the actors are very wary of sustained questioning on these topics. Informants were identified by RAs in random fashion by using a chain of those willing to respond to questions concerning elephant hunting and meat trading.

To collect the data, the research assistant (RA) usually needed to create a cover story to justify the questioning. To collect data on hunters, either the RA was originally from the surveyed area (knowing hunters personally) and could therefore explain his objectives and conduct an interview, or he had to hold an informal conversation trying to get as much information as possible without arousing hunters' suspicions. To interview the vendors/middlemen, the RA pretended to be a customer looking for elephant meat or, more rarely, to be a retailer himself. This latter option was sometimes risky as one RA was once denounced to the Wildlife Department 'as an elephant meat vendor' by middlemen she had contacted earlier. To interview the consumers, the RA pretended to be a student carrying out a survey for a university degree.

RAs reported that in some places where wildlife authorities or NGOs had carried out repressive measures, interviewees, especially hunters, might have given imprecise answers (e.g. reducing the number of kills). In other words, they trusted the RA enough to talk about their hunting activities, but they became cautious again in their answers when detailed questions were asked.

Participatory observation of hunts and marketing was not possible as time was not available to develop the necessary trust and stay with hunters and middlemen for the number of days required.

Four informant categories were defined:

1. Hunter (H)
2. Transporter/middleman (T)
3. Vendor (V)
4. Consumer (C)

As a result of limited field time, the number and geographic distribution of hunter and middleman informant types were not large enough to represent statistically valid samples, but considerable useful information was nevertheless gathered that can be used as a sound basis for further research. It is thought that a statistically valid, representative cross-section of consumers was sampled in Brazzaville and Pointe-Noire.

To allow informants to remain anonymous, a code was used to identify them, which included category of informant, location of interview followed by a chronologic number. For example, the third hunter interviewed in Mbomo was recorded as: HM3 (hunter, Mbomo, #3).

Questionnaires devised by the IUCN/SSC AfESG project consultant, with an instruction sheet, were used to record data for each of the four categories of informant. The questionnaires can be viewed in **Appendix 1**.

To weigh samples of meat and be able to calculate a price per kilogramme (kg), the research assistant had to buy several pieces of meat. Meat was weighed using a Pesola electronic scale. The meat was subsequently given to a needy person close to them or discarded. All FCFA prices have been converted to US$ at the rate of FCFA 500 = 1 US$.

Three general types of bushmeat market were surveyed:

1. Small, rural within 10 km of MIKE site boundary;
2. Town on road leading from the MIKE site, ~50-100 km from the boundary;
3. Large city distant from MIKE site.

Results

Hunters

Initial information suggests that elephant hunters differ from normal subsistence hunters in that they are specialized in large mammals and use either automatic military weapons or large-bore hunting rifles, often fashioned from 12-gauge shotguns. RAs identified who the elephant hunters were by making enquiries and then approaching them to ask for their cooperation.

Twenty-eight hunters were interviewed in two areas:

- Etoumbi-Mbomo main road south of the OKNP and
- Ouesso-Sembe main road north of the OKNP.

Pygmies are known to be very good elephant trackers and hunters and they often work for middlemen. During this current study, it was found that they were often employed for hunting north-west of the OKNP between Sembé, Souanké and the Ivindo River (Mbolo, pers. comm., 2010) and sometimes in the Mbomo area. Many other studies confirmed that Pygmies play a large part in elephant hunting all over the western Congo Basin region (e.g. Blake, 1994, 2006b; Delvingt, 1997). However, many Bantu hunters are also specialized in elephant hunting. Towards the Gabonese border near Oloba, it is frequently Pygmy hunters who are sent to hunt elephants, and numerous accidents have recently occurred, including deaths by elephant attacks.

It was not possible to obtain very precise information or to visit hunting camps, as the hunters were wary of the researchers' intentions. Elephant hunting areas were defined based on the accounts given by the hunters interviewed and are circled in red on the map below (**Figure 6**). GPS data were obtained by long-term field studies or surveys, such as the MIKE programme and anti-poaching patrols and checks set up by ECOFAC, WCS and WWF.

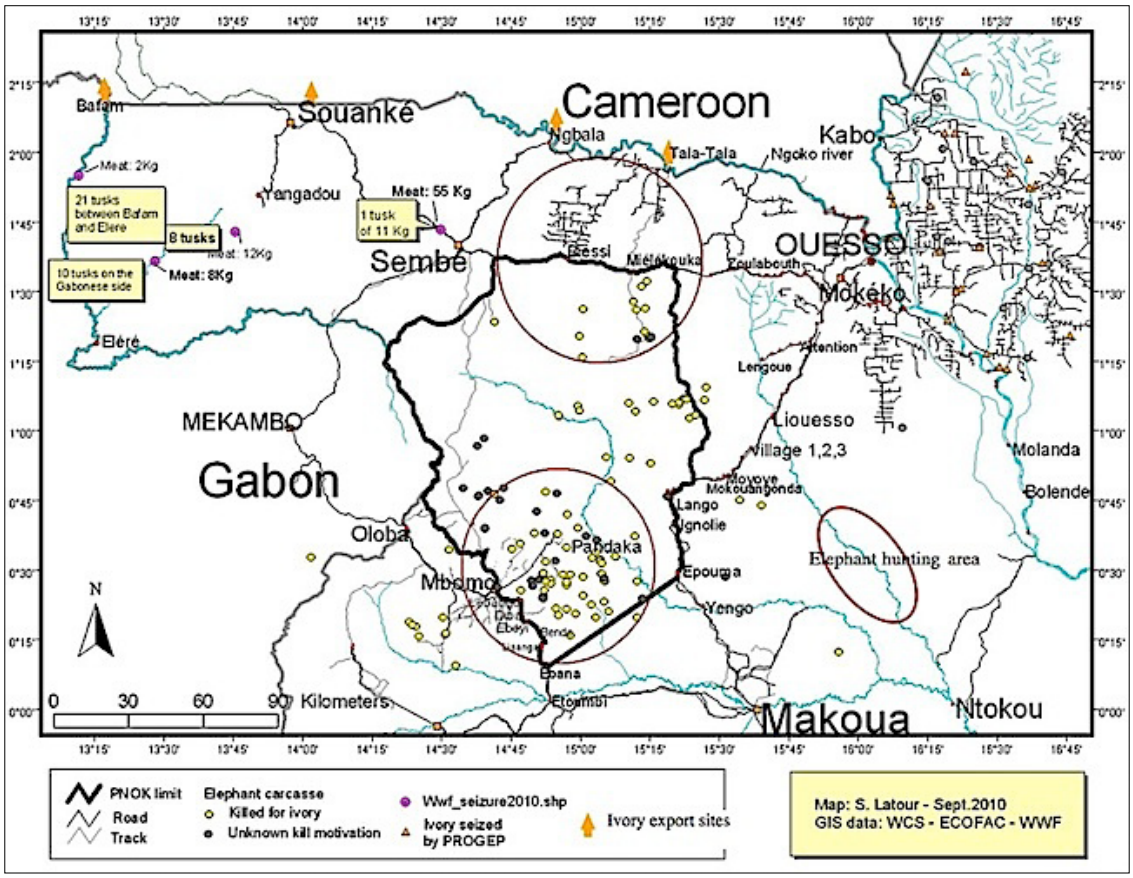
Figure 6 shows the elephant carcasses encountered by patrols in the OKNP (MIKE data 2003 to 2007) and in the Kabo area (WCS-PROGEP data 2004 to 2010). South of OKNP, all the kills recorded during interviews were committed inside the OKNP. It appears that many elephants are killed in the clearings of Lango and Mbouébé near Mboko.

Yellow points on the map represent carcasses showing evidence of poaching for ivory while grey points did not show any obvious evidence that could determine the motive for killing the elephant. None of the studies used meat as a killing motive variable; thus key data for the aims of this project are lacking.

North of the OKNP, hunters hunt both inside the park and outside in a logging concession on the land between the road and the Ngoko River, which marks the border with Cameroon. The triangle Souanké-Ngbala-Sembé is also

Pygmies are often involved in elephant hunting. (Photo: Dan Stiles)

Figure 6. Location of elephant kills in the OKNP area, 2003-2010



very rich in elephants according to WWF recent surveys (Mbolo, pers. comm., 2010) and it is also probably an important hunting area.

Elephant meat hunters

Many elephant kills are made inside the OKNP, as there are many *bais* such as Moadjé *bai* (25 km south of Miélékouké, which is in the north-eastern corner of the NP) and Ekagna, which attract many elephants. In 1995 and 1996 Moadjé *bai* was the scene of high rates of elephant poaching. More than 300 elephant carcasses (males, females, juveniles, and babies) were confirmed from the air and from the ground in 1996 (Nishihara, 2003).

The killings were done for ivory only, as the meat had not been taken. This *bai* is now monitored by ecoguards who are supported by WWF, with two teams alternating every three weeks (Mbolo, pers. comm., 2010.) Several factors affect the efficiency of their surveillance:

- irregular payment of their salaries;
- lack of personnel (only 10 ecoguards);
- armed clashes with poachers.

WWF explained that the rate of elephant kills is highly correlated negatively with the presence of ecoguards (Mbolo, pers. comm., 2010). As soon as the teams are in position and operational, the killing immediately stops and conversely, as soon as the ecoguards leave, the number of dead elephants found in patrols rises.

A well-known elephant poacher living in Miélékouka told one of the RAs that he had a track leading to Moadjé *bai* from just behind his house. He said that the *bai* was so large that he could evade the ecoguards. He said that hunting in Moadjé *bai* started in 1986 with military weapons. This hunter was recently sentenced for poaching, but is still free and continues to poach.

Hunters living in Biessi, Séka, Kokoua (between Séka and Sembé), Miélékouka, Zoulabouth and Goa hunt in the OKNP or north of the main road in the SOCALIB Tala-Tala logging concession (**Figure 6**). Middlemen who buy and trade the meat also live in these villages.

In the southern sector, the ECOFAC programme succeeded in reducing the frequency of elephant poaching,

but the anti-poaching system which exists has been weakened by the following factors:

- The irregular payment of ecoguard salaries (in August 2010 more than 20 months late) has reduced motivation to patrol and confront poachers;
- The ecoguards are considered 'family' with the local population, which limits their power to engage in repressive acts. Whenever they organize patrols, everyone knows when they will start and where they will patrol, which allows the poachers to avoid them;
- Lack of follow-up for arrests and confiscations of arms due to a deficiency of resources and corruption;
- The rehabilitation of the Makoua-Etoumbi road allows traffic to reach Brazzaville in one day, which facilitates the traffic and commerce of bushmeat.

In the village of Mbomo, poaching is facilitated in part by government agents (police and military), who order the meat and frequently furnish weapons and ammunition to poachers. In exchange, the hunter shares the meat with the person who initiates the hunt (*commanditaire*). In the case of ivory, it is bought entirely by the person ordering the hunt. So hunters benefit by receiving a part of the elephant meat and all the other animals killed during the hunt.

Military weapons seized by the ecoguards and turned over to the police or the military are regularly returned to the hunters. Ecoguards are supposed to inspect vehicles and control and arrest offenders. When they have to search a suspect at his home they are supposed to be assisted by policemen or gendarmes. In general, when the case is important, they are assisted by policemen or gendarmes to make arrests.

Table 1 shows the different types of hunters interviewed. Most of them are both 'commercial' and 'subsistence' hunters. Commercial hunters are those who hunt more or less full time as a profession and who sell most of the products they obtain from the hunt. Subsistence hunters, usually farmers, consume most of the meat they hunt within the household. Generally, those who own military weapons or large-bore hunting rifles and can afford ammunition hunt for themselves or they sometimes commission others to hunt for them. Those who do not own appropriate firearms for hunting elephants will work for *commanditaires*, who provide them with weapons and ammunition in exchange for half the tusks.

Hunters interviewed in the south are all Mboko, except one who is Bakwele. Hunters met in the north were Bakwele (3), Pygmies (3), Bonguili (2) and Pomo (1). The average age was 39.4 (from 25 to 68).

Many elephant hunters prefer small hunting parties to ensure that they are accompanied by reliable and trustworthy persons. They are usually relatives or very close friends. The duration of the mission depends on the distance travelled and on the aim of the mission. If meat has to be smoked it takes longer than just taking the tusks. Smoking the meat can take two to three days and must be done in forest camps near the kill site safe from the ecoguards.

Table 2 shows the work effort involved in an elephant hunt of the hunters interviewed. All the questions refer to their latest elephant hunt.

The mean number of elephant kills per hunting expedition was two, with a range of one to six. The killed elephants were composed of 50% adult males, 37% adult females and 7.5% juveniles. The hunters were asked about the largest number of kills they had ever made in one mission. The mean was 4.7, with a range of one to nine. It should be stressed that some interviewees may not have revealed the true number, as there is always some wariness when talking about illegal activities. It is known that when hunters enter a *bai* with automatic weapons, they can easily kill dozens of elephants.

WWF reported that in the ROC-Gabon Ivindo River area hunting is mainly traditional (or semi-traditional) and is

Table 1. Types of elephant hunters interviewed

Type	Number	Full time	Part time	Works for self	Works on command	Works for self & on command
Commercial	6	3	3	3	0	3
Commercial & Subsistence	22	6	16	14	5	3
Total	28	9	19	17	5	6

Table 2. Work effort of elephant kills

Elephant Kill	OKNP area	Location	Number of people in hunting party	Total distance travelled (km)	Total duration of the hunting mission (days)
1	South	Mbandza	4	30	5
2	South	Kéba	4	50	5
3	South	Ollémé	5	50	7
4	South	Ollémé	4	50	5
5	South	Ollémé	5	40	4
6	South	Mbandza	3	58	7
7	South	Diba	5	22	3
8	South	Lisanga	3	56	2
9	South	Ebana	6	60	14
10	South	Mbandza	4	40	7
11	South	Ebana	3	70	7
12	South	Ebana	6	100	14
13	South	Ebana	5	60	21
14	South	Ebana	4	45	7
15	South	Ebana	4	50	10
16	South	Papaye	5	40	14
17	South	Ebana	5	80	6
18	South	Ebana	4	40	14
19	South	Ebana	3	40	7
20	North	Ngoko river	3	?	?
21	North	Sangha river	?	?	?
22	East	Liouesso	4	?	14
23	East	Liouesso	?	?	?
24	North	Miélékouka	3	60	10
25	North	Douma	2	50	8
26	North	Miélékouka	3	55	9
27	North	Douma	3	56	14
28	North	Zoulaboth	2	80	12
Mean			**3.9**	**53.4**	**9**
Median			**4**	**50**	**7**

conducted largely by Pygmies, although Naftali Honig of PALF (pers. comm., 2010) states that hunting with AK-47s is also done in that area. They kill elephants with old shotguns (called *fusil de traite*) using a kind of short javelin, ending in an assegai head as a projectile instead of a bullet. This projectile seems to be very efficient and relatively cheap, costing less than FCFA 2,000 (US$ 4). A blacksmith residing in Lele, on the Cameroon border, supplies many hunters along the Ivindo River with these projectiles (Mbolo, pers. comm., 2010).

In non-Pygmy areas around the OKNP, hunters use mainly military firearms, usually AK-47s imported during the ROC's civil war in 1997. In reference to this, Demetriou, et al., (2001) stated that:

> "…. massive quantities of weapons were distributed to militias without any mechanisms to register ownership or ascertain that they were properly dispersed. At present, and taking into account the quantities lost, destroyed or collected, the vast majority of these weapons remain in the possession of ex-combatants."

Table 3. Investment and cost price for hunters

Elephant Kill	Owner of the weapon	Type of gun	Type of bullet	No. bullets used	Price/ cartridge (FCFA)	Total price (FCFA)	No. of kills	Expenses/ elephant (FCFA)
1	Policeman	AK47	1095, 711, 1039	60	350	21,000	2	10,500
2	hunter	AK47	1095, 711, 1039	60	250	15,000	2	7,500
3	Policeman sergeant	AK47	1095, 711, 1039	120	350	42,000	3	14,000
4	Policeman	AK47	1095, 711	60	250	15,000	3	5,000
5	Head of gendarmerie	AK47	1095, 711, 1039	40	250	10,000	2	5,000
6	Military	AK47	1095, 711,	90	250	22,500	3	7,500
7	hunter	AK47	1095, 711, 1039	30	300	9,000	1	9,000
8	hunter	AK47	1095, 711	30	200	6,000	1	6,000
9	hunter	AK47 Rifle	1095 1075	60	250	7,500	1	7,500
10	hunter	Rifle	1075	2	10,000	20,000	1	20,000
11	hunter	Rifle AK47	1075, 1095,711	4 30	10,000 100	43,000	1	43,000
12	hunter	Rifle AK47	1075 1095, 711	2 80	10,000 100	28,000	1	28,000
13	hunter	AK47	1095, 711, 1039	90	200	18,000	3	6,000
14	hunter	AK47	1095, 711	90	250	22,500	3	7,500
15	hunter	AK47	1095, 711	60	150	9000	4	2,250
16	hunter	AK47	1095, 711	90	250	22,500	5	4,500
17	hunter	AK47	1095, 711	90	250	22,500	3	7,500
18	hunter	Rifle	1075	3	10,000	30,000	6	5,000
19	hunter	Rifle	1075	4	10,000	40,000	1	40,000
20	military	AK47	1095	?			1	
21	Hunter	?	?	?				
22	military	AK47	1095	?			1	
23	?	?	?	?			1	
24	Farmer	12mm gun	Home-made bullet	2	?		1	
25	Hunter	12mm	?	2	?		1	
26	Hunter	12mm gun	Home-made bullet	3	?		1	
27	Farmer	12mm gun	?	7			1	
28	Hunter	Rifle	1075	2	10,000	20,000	1	20,000
MEAN						**21,175**		**12,787**

AK-47s are widely distributed amongst hunters in northern ROC. (Photo: Bassama Charles)

The authors estimated that 57,000 weapons were still in circulation at the end of 1999, and many of these are still being used in illegal hunting today. The situation allowed hunters to acquire automatic guns at a reasonable price or to use the one they were given during the war. According to Demetriou, et al., (2001), a Kalashnikov semi-automatic assault rifle could be purchased in ROC from US$ 13 to US$ 67, and ammunition could be bought for US$ 0.23 to US$ 0.38 per round. In 2000, the price of ivory in the interior was between US$ 3-6/kg, and three times as much in Brazzaville (Blake, 2006b), with the price on the illegal international market US$ 100 or more (Martin & Stiles, 2000). Russian or Chinese AK-47s with a clip of 30 rounds could be purchased for about the same price as perhaps a single tusk of 5-6 kg (Blake, 2006b). The situation today does not seem to be very different. According to Gun Policy[1], the asking price for an AK-47 type of assault weapon in the ROC in 2010 was US$ 50. **Table 3** shows the investment in ammunition of interviewed hunters.

Results show that an average investment of FCFA 21,175 (US$ 42.35) was made for ammunition on a hunting mission with an average cost of FCFA 12,787 (US$ 25.60) per elephant. Other animals were, however, also killed with this ammunition on the hunting trip. This estimate is only provisional, as the sample is small (N=20) and it only applies to hunters who own their own weapons. Other hunters are given weapons and ammunition by military personnel or police who do not pay for the guns or bullets.

Both WCS and WWF managers in the north OKNP area stated that elephant product seizures from hunters, including meat, had surprisingly gone up in recent years, despite limited human resources available to inspect offenders on the roads (about 14 ecoguards for each NGO). For the first half of 2010 alone, WWF seized 77 kg of elephant meat compared to 15 kg in 2009. These are still relatively small quantities when one considers that several hundred kilograms of meat can be procured from one elephant carcass.

Use and apportionment of meat removed from killed elephants

It was very difficult to collect accurate data of quantities in kg concerning the way in which hunters use and share elephant meat. In general, people do not measure meat in price/kg when they sell or buy, but speak of price per piece or price per pile. For ivory, however, there is a certain market price per kg.

The parts of meat eaten at the kill site are generally the following: eyelids, feet, heart, cheeks and trunk (in order of importance). The trunk is often kept to be sold as it is a highly appreciated part.

All the meat carried away is previously smoked at the hunting camp. Concerning the Mbomo area, the quantities of elephant meat carried from the forest to the village were described by informants as ‘a few baskets’ (rattan game bags), ‘one or two flour bags’ or ‘some pieces’. Some of this was shared with the family for household consumption. A flour bag contains 50 kg of flour, but the weight would be different when full of smoked meat. Several informants explained that a 50 kg flour bag normally contained 12 big pieces of meat (estimated at 2.5 kg each), meaning that a full flour bag of elephant meat would contain about 30 kg.

The tail is always brought back to the village, as it can easily be sold for use in ritual ceremonies and the hairs are used to make bracelets. According to the sample group, the price ranges with the size from between FCFA 1,000 to 5,000 (US$ 2-10) per tail.

To obtain more complete data, researchers would need to be present for a longer period of time and observe the entire process, counting and weighing in the field. It takes

Elephant tail bought for 3,000 FCFA (US$ 6) (Photo: S. Latour)

[1] http://www.gunpolicy.org/

Table 4. Disposal of elephant meat

Code	Quantity carried smoked (kg)	Kg for personal use	Kg sold to a middleman	Selling site
HS1	90 (3 baskets)	5	30 kg	Hunter's home
HS2	60 (2 baskets)	10	30 kg	Hunter's home
HM1	100	0	60 kg	Hunter's home
HM2	90 (3 baskets)	5	60 kg	Hunter's home
HZ1	60 (2 baskets)	10	30 kg	Hunter's home
Mean	**80 kg**	**6 kg**	**42 kg**	

much time to win the hunters' trust. However, as a rough guide, **Table 4** presents fairly accurate data collected near OKNP for five hunters. Informants stated several times that a flour bag full of elephant meat cost between FCFA 50,000 and 70,000 (US$ 100-140).

Assuming the bag to contain approximately 30 kg of meat, the price would therefore range from FCFA 1,667 to 2,333 (US$ 3.33-4.67)/kg. Relatively small quantities of smoked meat were carried away in the five samples recorded, ranging from 60 to 100 kg.

Hunters were asked to rank in order of importance (1 being most important) their reasons for hunting elephants. **Table 5** presents the results. For all the hunters interviewed, ivory was the first motivation for killing elephants,

Table 5. Hunters' motive for killing

Informant code1	A	B	C	D	E	F	G	H
HM1	2	3		1	1			
HM2	2	3		1				
HM3	3	4		1	2			
HM4	2	3		1	1			
HM5	4	3		1	2			
HM6	2	3		1	1			
HD7	2	3		1				
HL8	2	3		1				
HE9	2	3		1				
HE10	3	2		1				
HE11	2	3		1				
HE12	2	3		1				
HE13	2	3		1				
HE14	2	3		1				
HE15	3	2		1				
HE16	2	3		1				
HE17	2	3		1				
HP18	2	3		1				
HEb19	2	3		1				
HO1	4	3	2		1			
HO2		2		1				
HO3	4	2	3		1			
HO4	2	3			1			
HS1	3	4	2		1	5		
HS2	3		2	1				
HM1	4	3	2	1		5		
HM2		2	3		1	4		
HZ1	4	3	2		1			
Average	2.58	3.03	2.28	1	1.18	4.67		

A - Meat for self, family
B - Sell meat for self
C - Sell meat on commission
D - Sell ivory for self
E - Commissioned to hunt for ivory
F - Protect crops, property or life (HEC)
G - Cultural reason
H - Other

Table 6. Other bushmeat hunting

Species	No. who hunt	Av. % meat consumed*	Av. % meat sold
Blue duiker	12	50	50
Red duiker	18	20	80
Monkey	20	50	50
Red river hog	14	20	80
Porcupine	6	80	20
Buffalo	1	0	100
Gorilla	2	0	100

* The average is for all the meat of each species for all hunters grouped.

with a majority selling the ivory themselves, followed closely by those given orders to hunt for ivory. Elephant meat for subsistence was the second most important motivation, followed by selling the meat.

For HM1 and HM6, the hunters keep and sell some of the ivory as compensation and give the rest to the person commissioning them to hunt.

During an elephant hunting mission, hunters always kill other species depending on opportunities. They use a part of the meat to feed themselves on site and bring the rest to the village to give to their family and sell to customers (**Table 6**).

Several studies (Vanwijnsberghe, 1996; Elende & Zoubabela, 2009; Malonga, 2010; Hennessey & Rodgers, 2008) confirm that duikers are the most commonly hunted species and the most abundant in markets in northern ROC. Red duikers (*Cephalophus callipygus*, *C. dorsalis*) and blue duikers *(C. monticola)* represented from 63 to 70% of animals hunted. Duikers are followed by primates in terms of quantities hunted and sold. Monkeys represent about 18% of animals hunted (with a preference for the *Cercopithecus cephus*). Red river hogs are also highly appreciated and great apes are killed occasionally, with a preference for chimpanzees, which are not dangerous to kill and which can also be trapped with snares.

Hennessey & Rogers (2008) report that in 1994, an estimated 32 elephants were killed in a four month period to supply the quantity of meat and tusks seen passing through the Ouesso market. The elephant meat and tusks were arriving on a regular basis, the meat mostly from the Liouesso area and ivory from the Pokola area.

Ivory hunters

It is extremely difficult to investigate the ivory trade. Collecting reliable data specifically on ivory trafficking in the time given for this pilot study (six weeks) with the human resources available was not easy. Consequently, it was not possible to collect much information on this secondary objective. Research assistants did interview hunters on the subject, but middlemen and vendors were very suspicious of questions concerning ivory from people they did not know.

For the hunters who work on command, most said they are paid in kind with meat and keep half of the ivory for themselves while they give half to the person who ordered the hunt and provided weapons. The *commanditaire* can also offer to buy the hunter's half of the ivory. Hunters who work for themselves sell all the ivory and keep the proceeds.

North-west of the OKNP, between Sembé and the Ivindo River, Pygmy hunters are paid by *commanditaires* in kind with a portion of the meat, manioc flour and sachets of whisky (Mbolo, pers. comm., 2010).

Table 7 presents data relating to ivory trade for hunters. Prices are in FCFA (500 = US$ 1).

Although variability was quite high, average hunter prices were US$ 12/kg for <5 kg, US$ 20/kg for 5-10 kg, US$ 31/kg for 10-20 kg and US$ 45/kg for >20 kg weight tusks.

Transporters/middlemen

Elephant meat

Fourteen meat middlemen were approached to provide information (**Table 8**). They all transported the meat they traded. In general, they were very suspicious and it would take a much longer time to be able to infiltrate this commercial network. Initial results indicated that elephant meat is transported and sold along with other bushmeat; no special distinction is made for it.

Table 7. Hunters' ivory trade incomes

Code	Purchaser	Selling site	Tusk <5kg FCFA/kg	Tusk 5-10 kg FCFA/kg	Tusk 10-20 kg FCFA/kg	Tusk >20Kg FCFA/kg
ChM01	Congolese and Malian dealers	Mbomo (at home)	3,000	6,000	15,000	18,000 - 30,000
ChM02	Congolese and Malian dealers	Mbomo (at home)	2,500	5,000	10,000	30,000
ChM03	Congolese and Malian dealers and local officials	Mbomo (at home)	6,000	13,000	15,000	18,000
ChM04	Local and Malian shopkeepers	Mbomo (at home)	6,000	13,000	15,000	18,000 – 30,000
ChM05	Local and West African dealers	Mbomo (at home)	3,000	6,000	15,000	18,000 – 25,000
ChM06	Malian dealers	Mbomo (at home)	8,000	12,000 – 20,000	18,000	30,000
ChM07	Malian shopkeepers	Diba (at home)	7,500	12,500	15,000	30,000
ChM08	Malian shopkeepers	Lisanga (at home)	10,000	15,000	20,000	25,000
ChM09	Malian shopkeepers	Etoumbi (at home)	3,000	6,000	15,000	18,000
ChM10	West African dealers	Etoumbi	6,000	15,000	15,000	18,000
ChM11	Congolese and Malian dealers	Etoumbi	3,000	6,000	15,000	18,000
ChM12	Malian dealers	Etoumbi	10,000	15,000	15,000	18,000
ChM13	Malian dealers	Etoumbi	3,000	6,000	15,000	18,000
ChM14	Malian dealers	Etoumbi	3,000	6,000	15,000	18,000
ChM15	Malian dealers	Etoumbi	3,000	6,000	15,000	18,000 – 30,000
ChM16	Malian dealers	Etoumbi (at home)	3,000	6,000	15,000	18,000 – 30,000
ChM17	Congolese and Malian dealers	Etoumbi	6,000	8,000	15,000	18,000 – 30,000
ChM18	Congolese and Malian dealers	Etoumbi	5,000	6,000	15,000	18,000
ChM19	Malian dealers	Etoumbi and Ebama	3,000	6,000	15,000	18,000
ChO1	West African dealers	Ouesso	5,000	8,000	15,000	
ChO2	West African dealers	Ouesso	-	10,000	17,000	20,000
ChSé1	Senior executive working in Ouesso	Séka (at home)	-	-	15,000	25,000
ChSé2	Cameroonian dealer	Séka (at home)	-	-	17,000	20,000
ChMié1	Military officer from Ouesso	Miélékouka (at home)	-	-	15,000	25,000
ChMié2	Shopkeeper from Ouesso	Miélékouka (at home)	-	-	17,000	20,000
ChZou1	Cameroonian dealer	Zoulaboth (at home)	-	10,000	15,000	25,000
RSé1	-	-		17,000	20,000	25,000
Rmié1	-	-	10,000	13,000	15,000	20,000
Rmié2	-	-	12,000	15,000	18,000	25,000
Rzou1	-	-	11,000	15,000	17,000	23,000
Rzou2	-	-	10,000	15,000	18,000	25,000
Mean			**5,917 (US$ 12)**	**10,204 (US$ 20)**	**15,710 (US$ 31)**	**22,384 (US$ 45)[2]**

Although variability was quite high, average hunter prices were US$ 12/kg for <5 kg, US$ 20/kg for 5-10 kg, US$ 31/kg for 10-20 kg and US$ 45/kg for >20 kg weight tusks.

[2] US$ average was rounded off to the nearest dollar.

Generally, elephant meat and other bushmeat are carried to Ouesso either by road or by the Ngoko River, depending on the hunting area. A road passable by motorcycle exists between Biessi and Tala-Tala. When by road, bushmeat and ivory are often transported by official cars belonging to the people who have ordered the products and/or provided military weapons, so they can go through check points unhindered.

Ivory, and occasionally elephant meat, are hidden in baggage and transported to Brazzaville in vehicles that transport people and their goods, such as the large Mercedes trucks found on these roads, or by the bus company Océan du Nord. Some poachers also take advantage of the arrival of officials in Mbomo (politicians or military) to transport the products of illicit trade to Brazzaville. These officials either personally consent to assisting in this trade or facilitate it through their subordinates.

Some foreign traders, often West African, prefer to export their merchandise to Gabon, which is less than 100 km away via Oloba, most likely to use a route free from checkpoints on to Cameroon.

The sample size is small and not representative of the diversity of this link in the commodity chain. It appears that bushmeat is often transported by river, with the Sangha and Lengoué rivers used to transport products to the Congo River, which constitutes a main 'highway'. The bushmeat comes from northern Congo and also from DRC, in particular from Salonga NP (Omari & Ibata, 2010, pers. comm.). Very large boats called *baleinières* (whaleboats) have freezers on board and can transport large quantities of fresh and smoked meat. Prohibited meat is well hidden in big trunks, which also contain tools, diesel fuel, etc. Many transactions between middlemen and suppliers (hunters or first middlemen) are made without even disembarking, in the middle of the river from a canoe to the big boats. One of the RAs went to some strategic trading points on the Congo River and confirmed the important river bushmeat traffic, but did not have time to obtain detailed information from the transporters/middlemen.

WWF reported that no significant elephant meat trade was uncovered on the upper Ivindo River, so huge amounts of elephant meat have been left rotting in the forest.

Table 9 presents examples of meat transport trips reported by a sample of middlemen in the OKNP area.

Public bus was the most common means of transport of meat to Brazzaville, with one case each of truck and airplane reported. Meat was most often transported from OKNP to Ouesso by motorbike, with public bus being the second means of transport most commonly used. Occasionally, government vehicles, private cars or canoes were used. A larger sample might alter these results.

All the transporters interviewed have regular suppliers and customers. They organized their trip and itinerary according to their suppliers and bought quantities of meat according to their subscribers or regular retailers' orders. If they have enough stock, they can also sell goods to infrequent customers. Transporters working in Brazzaville

Table 8. Information on middlemen interviewed

Transporter	Interview location	Home	Age	Sex	Ethnic group	Transporter since when (year)	Other job
TB1	BZV	BZV	25	M	Makoua	2009	Bushmeat retailer
TB2	BZV	BZV	40	M	Kongo	?	?
TB3	BZV	BZV	?	F	Kongo	2006	No
TB4	BZV	BZV	45	M	Bakwele	1998	Admin officer
TB5	BZV	BZV	36	F	Kouni	2008	Shopkeeper
TB6	BZV	BZV	39	F	Bateke	2007	No
TB7	BZV	BZV	45	F	Bakwele	2008	nurse
TO1	Ouesso	Ouesso	49	M	?	2008	No
TS1	Séka	Ouesso	35	M	Djem	2001	Shopkeeper
TM1	Miélékouka	Ouesso	30	M	Bonguili	2005	Bushmeat retailer
TM2	Miélékouka	Ouesso	34	M	Bakwele	2009	Shopkeeper
TZ1	Zoulaboth	Ouesso	28	F	Bakwele	2006	Bushmeat retailer
TZ2	Zoulaboth	Zoulaboth	32	M	Bakwele	2008	Shopkeeper
TZ3	Zoulaboth	Zoulaboth	42	M	Bakwele	2007	Shopkeeper

Table 9. Middlemen meat transport

Transporter	Meat transported		Round trip distance (Km)	Duration of the trip (day)	No. trips/ month	Means of transportation			Type of road
	From	to				1st	2nd	3rd	
TB1	Cuvette ouest	Makoua	200	1	1	bus	private car	canoe	public
TB2	Cuvette	BZV	500	3	0.5	bus	truck		public
TB4	Ouesso	BZV	900	2	2	bus			public
TB5	Sibiti	BZV	450	2	2 to 3	bus			public
TB6	Etoumbi	BZV	600	2	2 to 3	bus			
TB7	Ouesso	BZV	900	2	2	bus	airplane		public
TO1	Ngoko river	Ouesso	?	?		canoe			river
TS1	Séka	Ouesso	120	1		motorbike	bus	Gov. vehicle	public
TM1	Séka	Ouesso	120	2		motorbike	bus	Gov. vehicle	public and logging
TM2	Miélékouka	Ouesso	120	2		motorbike	bus	Gov. vehicle	public
TZ1	Zoulaboth	Ouesso	73	1 to 3		motorbike	bus	-	public
TZ2	Zoulaboth	Ouesso	73	1 to 2		motorbike	bus	private car	public
TZ3	Zoulaboth	Ouesso	73	2		motorbike	bus	Gov. vehicle	public

have restaurant owners as customers. They use public transport or government vehicles if these are available. When travelling by bus, checkpoints are usually not an obstacle for middlemen as they conceal the meat well. If the meat is found by an ecoguard or the police, they bribe to continue on their way. Important quantities of bushmeat are also sent from the north (i.e. Ouesso and Impfondo) to Brazzaville by airplane (Malonga, 1996).

Preliminary data from only six middlemen informants resulted in an average selling price for elephant meat of FCFA 1,766 (US$ 3.55)/kg, with a range of FCFA 1,200-3,000 (US$ 2.40-6), but further research is needed to confirm this. The six transported 25 kg to 100 kg of elephant meat, with an average of 47.8 kg, relatively small amounts. Only two of the meat middlemen reported transporting ivory also.

Ivory Transporters/Middlemen

As was pointed out above, it was not possible to approach middlemen specializing in the ivory trade. According to NGO managers and other informed people, ivory obtained in the Ouesso area is taken to Cameroon across the Ngoko River. In Cameroon, road networks are more developed and it is easy to transport ivory either to Yaoundé or to the port of Douala for export. Informants also said that ivory could go to Nigeria. It is easier and safer to transport ivory to buyers in Cameroon, where demand is higher than in Brazzaville. WWF, together with OKNP and the National Agency for National Parks/MINEF (Gabon), uncovered an ivory trade network on the Upper Ivindo leading to Cameroon.

The known buyers of ivory in Mbomo include local merchants, the head of the gendarmes and some Malian traders. Middlemen also operate in Ouesso.

PALF provided information on their investigations of illegal ivory traders and results of arrests and trials. **Table 10** lists the closed cases concerning ivory traffickers.

In both cases, cross-examinations to identify the trafficker's network were very weak and no information resulted (Honig, pers. comm., 2010).

In addition to those closed cases, five other cases of ivory trafficking are still in the process of being judged (four in Brazzaville, one in Pointe-Noire). PALF organized the first arrest of elephant meat vendors in Brazzaville in December 2010. Two vendors were arrested with a sack containing 25 kilogrammes of elephant meat.

Table 10. Closed ivory traffickers' cases

Case #	Country of origin	Date	Sentence	Fine (CFA) (US$)	Damages (CFA) (US$)
1	ROC	Apr-09	3 years (suspended)	500,000 1,000	800,000 1,600
2	DRC	Oct-09	1 year (custodial)	300,000 600	4,500,000 9,000
3	DRC	Oct-09	1 year (custodial)	300,000 600	4,500,000 9,000
4	DRC	Oct-09	1 year (custodial)	300,000 600	4,500,000 9,000
5	ROC	Apr-08	6 months (suspended)	100,000 200	1,000,000 2,000
6	ROC	Nov-09	5 years (suspended)	50,000 100	2,000,000 4,000
7*	China	Jan-10	2 years (suspended)	unknown	Unknown
8	ROC	Mar-10	2 years (suspended)	200,000 400	1,000,000 2,000
9*	China	May-10	3.5 years (suspended)	100,000 200	1,000,000 2,000

**Case 7:* arrested with five whole tusks, eight statuettes, 20 rings, three bracelets and two ivory seals. The ivory was suspected to come from Kinshasa.
**Case 9:* this Chinese woman was arrested in Maya-Maya airport with four whole tusks that were detected by the scanner. She is a shopkeeper in Brazzaville specialized in selling military uniforms.

In 2009 PALF instigated a seizure of illegal ivory in ROC. (Photo: PALF)

A number of other cases involving elephant poachers, and in one case, ivory traffickers, have taken place in Sangha. These sentences often include significant fines as well as custodial sentences; although in practice these sentences cannot realistically be served as the prison is not functional in Ouesso.

One elephant poacher is known to have been sentenced in Djambala as well in December 2010. He was held in custody while on trial, but his sentence was a suspended sentence.

In June 2010, 37 elephant tusks were seized by OKNP and MINEF (Gabon) guards on each side of the Ivindo River (10 on the Gabonese side and 27 on the Congolese one), with WWF support.

Chinese nationals have been arrested in Brazzaville and Pointe-Noire trying to smuggle raw and worked ivory to China (Anon., 2010; Anon., 2011).

In August 2011 a Chinese national was sentenced to four years in prison, a demonstration of the government's determination to control ivory trafficking (Séverin, 2011).

Vendors

Elephant meat

Brazzaville

Brazzaville, the administrative capital, has a population of over 1,300,000 inhabitants living in seven districts: Makélékélé, Bacongo, Poto-Poto, Moungali, Ouenzé, Talangaï and Mfilou. There are many bushmeat markets in Brazzaville, retail or wholesale.

Wholesale markets

Any place where bushmeat was purchased in bulk by retailers, even without being a proper market, was considered a wholesale market. These include the following:

- Maya-Maya Airport: middlemen go to the airport and pick up their bushmeat parcels and bags arriving by plane (mainly from the north, i.e. Sangha and Likouala districts). Often vendors meet the middlemen at the airport as they know the flight schedules.

- Port Yoro/the Beach: on the Congo River, on the edge of downtown. The boats *(baleinières)* arrive from northern Congo and from DRC full of bushmeat. Retailers come here to obtain a fresh supply at the landing, or meet the boats in the middle of the river (or upstream from the port) with their own pirogues to be more discreet.

- Marché Bouemba (Ouenzé): located on a big avenue where buses and trucks arrive from the north of the country and where vendors come to get fresh supplies three times a week.

- Marché Commission (Bacongo): a place where vehicles come from the Pool district north of Brazzaville near the Congo River, Stanley Pool. The bushmeat is purchased mainly by vendors who work in Marché Total.

- Marché Mfilou: on the RN 2 where all the vehicles coming from the north arrive with bushmeat and other produce.

Main retail markets

- Marché de Dragage (Talangaï): it is a night market (one of the biggest bushmeat markets) that opens at 6 p.m. About a dozen tables sell bushmeat.

- Marché du Plateau des 15 ans (Moungali): a huge market of about 3,700 tables (PALF, pers. comm., 2010), with only 10 being for bushmeat.

- Marché de Ouenzé: more than 4,000 tables, but no accurate information about the number of tables selling bushmeat (from 10 to 20). Bushmeat is often combined with other meats and fish on the same table. Vendors are flexible and do not specialize due to the irregular delivery of bushmeat.

- Marché de Moungali: about 5,000 tables, with around 15 tables selling only bushmeat.

- Marché Total (Bacongo): the biggest market of Brazzaville, in terms of surface area and infrastructure. Around 6,000 tables, about 40 of them selling bushmeat.

- Marché Poto-Poto: in the centre of town.

Smaller markets

- Mikalou, Makélékélé, Moukondo, Texaco, Soukissa, 10 Francs.

Seventy-six market visits were made in Brazzaville in 20 different markets. Elephant meat vendors were present 19 times representing 11 different individuals (see **Table 11**). Ouenzé Market displayed the most elephant meat, with a total of 59 kg seen with six vendors selling for US$ 11.06-14.81/kg (mean = US$ 13.05/kg). Total Market had the next largest quantity with four vendors selling 32 kg of elephant for US$ 8.33-15.38/kg (mean = US$ 11.26/kg).

Table 11. Bushmeat market survey

Location	Market	No. of visits	How many times ele meat vendors were present	No. of different Ele meat vendors
BZV	Ouenzé	12	7	4
BZV	Total	9	8	5
BZV	Moungali	6	0	
BZV	Poto-Poto	6	3	1
BZV	Beach	5	0	
BZV	Mikalou	5	1	1
BZV	Mfilou	3	0	
BZV	Makélékélé	3	0	
BZV	Dragage	4	0	
BZV	Yoro	3	0	
BZV	Lycée	3	0	
BZV	Plateau 15 ans	2	0	
BZV	Moukondo	2	0	
BZV	10 Francs	2	0	
BZV	La base	2	0	
BZV	Kissoundi	2	0	
BZV	Commission	2	0	
BZV	Railway station	2	0	
BZV	Coach station	2	0	
BZV	Texaco	1	0	
Ouesso	Diazi	7	0	
Ouesso	Central	6	4	4
Ouesso	Port	6	2	2
Ouesso	TP	7	0	
Ouesso	Home	1	1	1
Total		**102**	**25**	**17**

Poto-Poto Market had one vendor selling 6.9 kg at US$ 15/kg and Mikalou had one vendor selling 4.8 kg at US$ 12.12/kg. One person sold elephant meat from home for US$ 16.67/kg. The overall average price was US$ 12.76/kg.

Ouesso

There is one central retail market in Ouesso and two minor ones (TP and Diazi). The Port of Libongo can be considered as a wholesale market as it is the place where boats unload bushmeat, together with the bus station where middlemen arrive by public buses with bushmeat collected between Ouesso and Lango. These five markets were surveyed during 27 visits over seven days by two RAs. Seven different elephant meat vendors were seen, with one of them selling meat from home.

In Ouesso, vendors and restaurant owners are very careful and buy protected species bushmeat directly from middlemen in their homes or wait for the merchandise at arrival points (Port de Libongo and the bus station). At the port, totally protected species are hidden and sold only to people who give a predetermined password, while unprotected species are openly displayed.

During the July 2010 survey, vendors were seen regularly in Brazzaville markets with elephant meat clearly displayed on their tables. In August, during a second market investigation, no elephant meat was found, even with the vendors previously identified, with one exception. A few days previously, Naftali Honig, PALF coordinator, had organized the arrest of a retailer in the Marché Total who was selling a smoked chimpanzee carcass. As usual, PALF made this arrest the focus of media attention and the message was well disseminated, so vendors stopped selling protected species for a while.

Unprotected species of bushmeat for sale at the Port of Libango, Ouesso (Photo: S. Latour)

That was a very good demonstration of the effectiveness of law enforcement, but it modified our study conditions.

Tables 12 and **13** present occurrences of elephant meat vendors and some retail price data. All the prices/kg were calculated precisely and pieces of meat weighed with an electronic scale.

The average retail price for elephant meat was 62.5% higher in Brazzaville than in Ouesso, although there is a small overlap in prices in a few instances. One can readily see the opportunity for profit in trading elephant meat. Hunters sold the meat near the OKNP for US$ 3.33 to 4.67/kg and vendors sold it in Ouesso for an average of nearly US$ 8/kg and in Brazzaville for an average of US$ 12.76/kg.

Smoked elephant meat in Brazzaville and Ouesso
(Photos: S. Latour)

Pointe-Noire

Wholesale markets

The Grand Marché: this is the main wholesale market where almost all the retailers in town come to obtain a fresh supply of bushmeat. There are about 30 tables selling bushmeat. The RAs met the president of the bushmeat vendors' organization who revealed that the wife of an important Brazzaville politician was an important wholesaler. She worked with several regular hunters pro-

Table 12. Retail elephant meat vendors in Brazzaville markets

Elephant meat vendor	Date	Market	Estimated quantity on the table (kg)	Price FCFA/ kg (with weighing)	other bushmeat sold	Other protected species
VB1	1-Jul	Ouenzé	4	7,142	duiker, monkey, hog	buffalo
VB1	7-Jul	Ouenzé	2.8	6,451		
VB2	1-Jul	Total	6	7,692	duiker, monkey	
VB3	2-Jul	Mikalou	4.8	6,060	?	
VB4	2-Jul	Ouenzé	6	5,529	duiker, hog, porcupine	
VB4	17-Jul	Ouenzé	1			
VB5	2-Jul	Ouenzé	9	6,422	monkey, hog	
VB5	4-Jul	Ouenzé	7			
VB5	17-Jul	Ouenzé	2	6,666		
VB6	5-Jul	Ouenzé	4	6,060	duiker, monkey	
VB7	7-Jul	Poto-Poto	6	7,500	duiker, monkey	chimp, buffalo
VB7	15-Jul	Poto-Poto	0.5			
VB7	17-Jul	Poto-Poto	0.4			
VB8	7-Jul	Total	5.5	4,166	duiker, monkey, hog	chimp
VB9	7-Jul	Total	4	4,687	duiker, monkey, hog	
VB9	17-Jul	Total	6	5,405		
VB10	12-Jul	Total	8	6,206	duiker, monkey, hog, porcupine	
VB10	17-Jul	Total	2.5			
VB11	13-Aug	Ouenzé	5	7,407	duiker, monkey	
VB12	11-Aug	Home	?	8,333	monkey	buffalo
Mean			**4.4**	**6,382**		

Table 13. Retail elephant meat vendors in Ouesso markets

Elephant meat vendor	Date	Market	Estimated quantity on the table (kg)	Price FCFA/kg (with weighing)	Other bushmeat sold	Other protected species
VO1	9-Jul	Central	2.5	2,678	duiker, porcupine	-
VO2	12-Jul	Central	hidden under table		duiker, monkey	-
VO3	12-Jul	Port	hidden under table		monkey, hog	-
VO4	13-Jul	Central	hidden under table	4,166	duiker, cane rat	-
VO5	14-Jul	Central	?	3,571	duiker, monkey, hog	-
VO6	10-Jul	Home			duiker, porcupine	-
VO7	13-Jul	Port		5,555		-
Mean				**3,993**		

viding them with weapons and ammunition. She also has a restaurant in town where bushmeat is served.

Marché Makayabou-Nkouikou and Marché Mont Kamba: these are both located on the northern edge of the town. Trucks, buses and middlemen arrive there from the bush and some wholesalers wait for goods, including bushmeat.

Marché Mvou-Mvou: it is close to the place where vehicles, bushmeat and middlemen arrive from Conkouati, located to the east of Brazzaville near the border with Gabon.

Retail markets
Marché Tié-Tié, Miambazila (Fond Tié-Tié), Marché Mayaka, Marché Faubourg.

In Pointe-Noire, over a one-week period, 21 market visits were carried out in eight different markets. No elephant meat was found. Vendors seemed to be more distrustful than in Brazzaville and several of them became angry when RAs were too insistent. Many vendors said they were afraid to sell protected wildlife meat since a well known hunter and elephant meat wholesaler, a DRC national, had been arrested five years previously. They also pointed out that since WCS began work in Conkouati NP, there were more checkpoints and more arrests. The president of the bushmeat vendors association confirmed this account and added that elephant meat was still sold occasionally, but secretly. Two retailers also said that elephant meat came from Conkouati, from the border with Cabinda and from Moulenguibinza in Gabon.

One of the RAs, posing as a prospective buyer for a large quantity of elephant meat for a traditional party, managed to meet an elephant hunter. The hunter had just received an order from a restaurant owner who wanted elephant meat. He was therefore organizing a special mission for this purpose. The restaurant owner had given him money and food as an advance. He estimated the cost for tracking and killing an elephant at FCFA 100,000 (US$ 200). The hunter requested an advance of FCFA 50,000 from the RA before killing an elephant for her, which obviously was not forthcoming. The incident demonstrates, however, how easy it is to obtain large quantities of elephant meat, if one has the money.

Ivory Vendors
The only handicraft market in Brazzaville, located next to the Marché du Plateau, was visited several times by the team leader to look for prohibited animal products in general and ivory in particular. Only three bracelets made of elephant hair and a necklace with three ivory beads were found. The vendor also had golden cat skins and other non-identified animal parts (even a dried buffalo head). He refused to provide information about ivory and pretended that he was not the owner of the shop. No other ivory was observed, although it is possibly kept hidden, unless a customer requests it.

In Pointe-Noire at the Marché des Voiliers, the largest handicraft market in the city, RAs also found elephant hair bracelets displayed on tables. When they requested, some small ivory objects hidden under the tables were brought out. One RA, pretending she needed to place a big order, was introduced to a jeweller who gave her

some information. The ivory comes from the Kouilou region to the north of Pointe-Noire (Conkouati and Ntié-tié), the Niari region and Cabinda. Traffickers are Malaysian, Senegalese, Malian and from DRC. The jeweller was selling ivory beads that were about 2 cm in diameter for FCFA 8,000 (US$ 16) each, an extremely high price.

No worked ivory was found in Ouesso, where there are very few tourists and no handicraft markets or shops.

Consumers

Elephant meat

One hundred and fifty consumers were interviewed in Brazzaville and 207 in Pointe-Noire. Every section of each city and each socio-economic category was sampled to obtain a representative cross-section of the population. One RA spent 15 days interviewing in Brazzaville and the author and three RAs spent a total of 19 interview days in Pointe-Noire.

Brazzaville results

Bushmeat is eaten by all of the consumers sampled, with a more frequent consumption by men. Most of men interviewed have eaten elephant meat at least once, but for some it was a long time ago and on very few occasions. **Table 14** presents food habits in terms of consumption of bushmeat in general and elephant meat in particular.

Table 15 presents the reasons for those not eating elephant bushmeat.

It is important to note that 80% of men and 52.5% of women who do not eat elephant meat do not do so because of lack of availability. If the meat were to become more available, consumption would rise. No one avoided elephant meat because it is illegal.

Among the Brazzaville people who do eat elephant meat:

- 57.6% eat it in town, 35.3% in the bush and 7.1% in town and in the bush;
- 63.1% buy the meat, 36.9% receive it as a gift from family or friend;
- 88.8% like eating this meat for its taste and 11.3% for a cultural reason.

Pointe-Noire results

There are obvious differences between Brazzaville and Pointe-Noire bushmeat eating habits. For example, some people never eat bushmeat for religious or health reasons (e.g. Ebola) in Pointe-Noire and quite a substantial proportion of the sample of men (77.1%) and women (80.4%) have never eaten elephant meat (**Table 16 and 17**).

Among the Pointe-Noire elephant meat-eaters:

- 36.4% eat it in town, 45.5% in the bush and 18.2% in town and in the bush;
- 56.8% buy the meat, 43.2% receive it as a gift from family or friend;

Table 14. Food habits in Brazzaville

	Bushmeat eating				Elephant meat eating			
	M		F		M		F	
	No.	%	No.	%	No.	%	No.	%
Never	0	0	0	0	25	31.3	40	57.1
Rarely*	20	25	41	58.6	36	45	26	37.1
Regularly	18	22.5	15	21.4	11	13.8	2	2.9
Often	42	52.5	14	20	8	10	2	2.9
Total	**80**	**100**	**70**	**100**	**80**	**100**	**70**	**100**

*Rarely: < once/month; Regularly: 1 to 3 times/month; Often: >3 times/month

Table 15. People not eating elephant meat in Brazzaville

	Why don't you eat elephant meat?			
Reason	M		F	
	No.	%	No.	%
Culture & religion	5	20	15	37.5
Availability (in markets)	20	80	21	52.5
Taste	0	0	4	10
Health	0	0	0	0
Price (too expensive)	0	0	0	0
Law respect	0	0	0	0
Total	**25**	**100**	**40**	**100**

Table 16. Meat habits in Pointe-Noire

	Bushmeat eating				Elephant meat eating			
	M		F		M		F	
	No.	%	No.	%	No.	%	No.	%
Never	14	13.3	19	18.6	81	77.1	82	80.4
Rarely	35	33.3	41	40.2	21	20.0	19	18.6
Regularly	45	42.9	35	34.3	2	1.9	0	0
Often	11	10.5	7	6.9	1	1	1	1
Total	**105**	**100**	**102**	**100**	**105**	**100**	**102**	**100**

Table 17. People not eating elephant meat

Reason	Why don't you eat elephant meat			
	M		F	
	No.	%	No.	%
Culture & religion	19	23.5	20	24.4
Availability (on markets)	36	44.4	27	32.9
Taste	8	9.9	22	26.8
Health	7	8.6	5	6.1
Price (too expensive)	4	4.9	4	4.9
Law respect	7	8.6	4	4.9
Total	**81**	**100**	**82**	**100**

- 72.7% like eating this meat for its taste, 13.6% for religious/cultural reasons;
- 11.4% have no particular reason and 2.3% for health.

Restaurants

- Twenty-five restaurants were visited 32 times in total in Brazzaville. None of them had elephant meat or any other protected species meat on the menu. Most of them declared that protected species had to be ordered in advance, as it was too expensive to keep in stock. Only two of them said they could serve elephant meat on order.
- Five restaurants were visited eight times in total in Ouesso. None of them had elephant meat on the menu, but one of them said he could serve it on order.

Location of Hunting Camps and Bushmeat Markets

Figure 7 shows the location of permanent markets and known bushmeat collection points around the OKNP and on the road to Brazzaville.

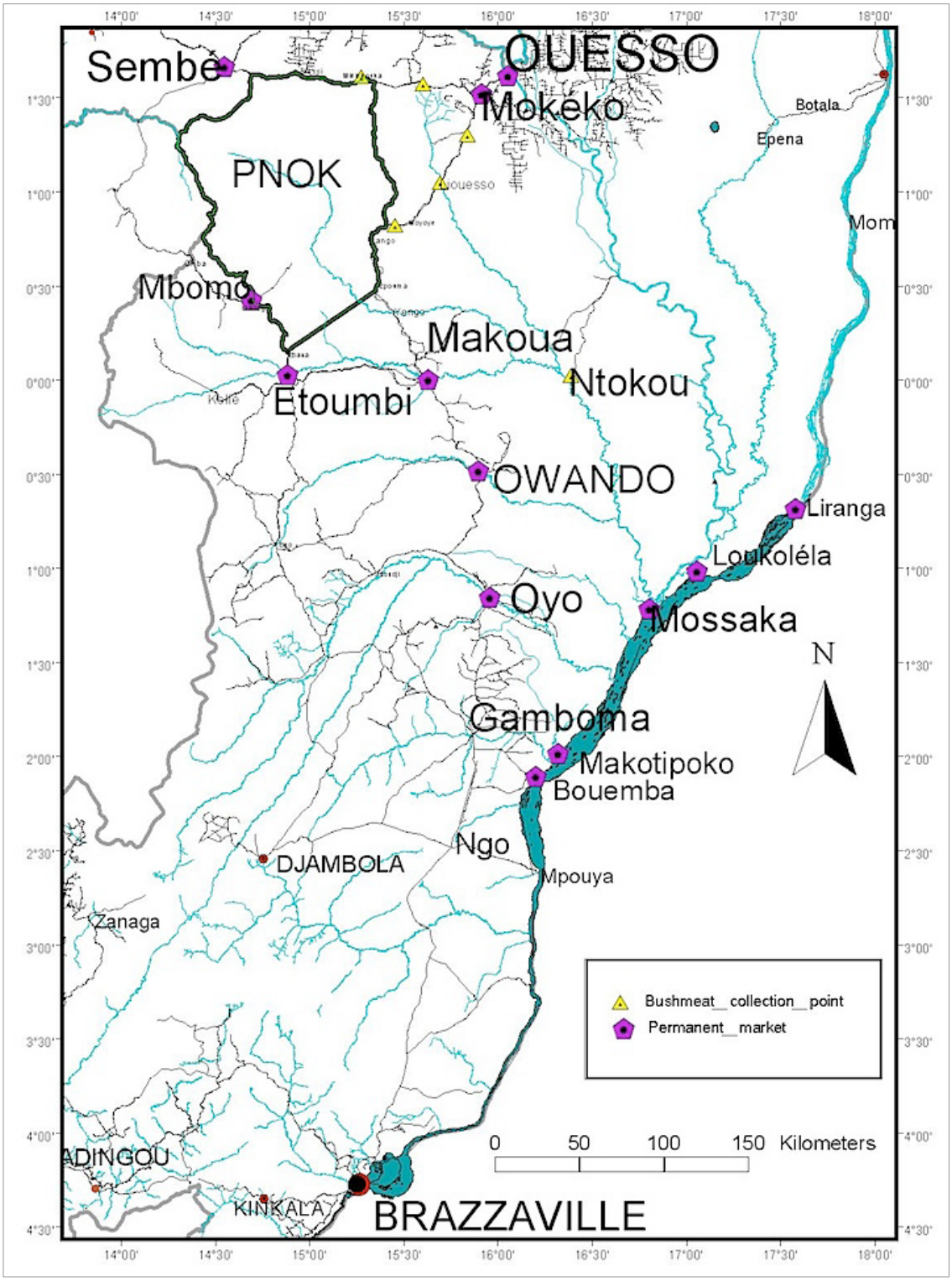
One of the RAs visited Makoua, Owando, Oyo, Mossaka and Loukoléla to investigate the markets and collect information about the organization of the bushmeat trade.

Makoua: after two days visiting three different markets, the RA finally found a single bushmeat vendor who sold only duikers. No elephant meat was seen. Retailers explained that they had stopped selling bushmeat since the radio and newspapers warned them about a possible Ebola outbreak in the area. Indeed, three weeks earlier, three hunters died in Mokouangonda (100 km north of Makoua) under circumstances and with symptoms that could be associated with an Ebola infection. While researchers and doctors were running medical tests, authorities recommended that the population not hunt, sell or eat bushmeat. While recommendations were followed in Makoua, nothing changed in Ouesso, which receives bushmeat from this area. The project team leader was present when the suspected outbreak began and noticed no change in Ouesso. Fruits bats, which are suspected to be a reservoir for Ebola, were even sold in the Port market.

The only information that could be obtained in Makoua was that the bushmeat usually came from Ntokou (**Figure 7**) and that selling protected species was far too dangerous because of the risk of arrest and conviction.

In *Owando*, two markets (Central and Olocko) and the port were visited. Bushmeat was found only in the Central market, but no protected species were identified.
In *Oyo*, non-protected species were found at the Grand

Figure 7. Permanent markets and bushmeat collection points between Ouesso and Brazzaville



Fresh whole fruit bats (including *Hypsignathus monstrosus*, a known Ebola reservoir, on the right) in Ouesso market (Photo: S. Latour)

Marché. The bushmeat comes from the villages alongside the Alima River, from Mossaka and from DRC.

In *Mossaka*, known to be a hot spot for bushmeat trade on the Congo River, it seems that vendors and transporters of protected species have found a way of avoiding police and wildlife authorities. They organize the trade on the river from boats, sometimes at night. They also claim to have alternative methods to sell forbidden products, but did not divulge what these were. They did confirm that elephant meat sold in Brazzaville came from Ouesso, Bétou, Pokola, Pikounda, Liranga and DRC via Mossaka. According to them, it was so well hidden in the boats that policemen and ecoguards could not find it and, in any case, the police and MDDEFE staff are too few to inspect all boat traffic. An official market exists on the bank of the river, but only non-protected species were found.

In *Loukoléla*, north of Mossaka, retailers held the same views about elephant meat as in Mossaka. They denied that it could be found in the market but recognized it could probably be bought elsewhere in town and indicated where that kind of meat originated.

Discussion

Elephant meat

No other study has been conducted specifically on elephant meat in the ROC. There have been studies about bushmeat in general in which some elephant meat variables appear. Hennessey & Rogers (2008), analyzing data collected in Ouesso in 1994, report that elephant meat or tusks were continually coming through the market on an average of 3.8 times a week, which would be equivalent to two elephants killed and sold per week. They added that, according to hunters and buyers interviewed, up to the equivalent of three elephants per week could be providing the products seen during the dry season. No price was given specifically for elephant meat, but they said that all bushmeat was sold in 'bunches' of variable weight and quality for FCFA 200-500 (US$ 0.40-1 in 1994). If these were similar to the way in which bushmeat is sold in the DRC, these bunches are called *tas* (piles) and weigh about 150-200 gm each, which would translate to US$ 2-5/kg. In 2010, hunters received about US$ 3.33-4.67/kg for elephant meat, quite similar to prices 15 years previously. In 1994 Hennessey & Rogers (2008) concluded that demand outstripped supply and currently the same situation probably prevails. One difference with today is that protected species were sold openly in 1994. The authors stress that there was low law enforcement and little effective protection of wildlife, a situation that has improved somewhat since then with the interventions of WWF, WCS and ECOFAC.

Vanwijnsberghe (1996) reported that a hunter in early 1995 obtained FCFA 15,000 from meat on his last elephant hunt in the OKNP area, worth about US$ 30. But returns could be much higher than that. Hunters around OKNP said that an average forest elephant could provide 30 to 40 *morceaux* ('pieces') of meat, sold at FCFA 2,000 each (US$ 8), or US$ 240-320 from one elephant. Another hunter reported that an old bull could supply 12 'fish baskets' of meat (50 cm in diameter by 2 m long). Each contained about 50 pieces of meat at FCFA 2,000 each, which calculates to US$ 2,400. The last statement was made by a famous elephant hunter so it must be taken with a grain of salt. Vanwijnsberghe does not indicate whether these quantities were for fresh or smoked meat, but probably the former.

In Olémé village on the western edge of OKNP, hunters talked of killing 60 elephants a year, and big game hunting was the main source of meat for the villagers (pop. 142 in 1995). Since ECOFAC initiated its anti-poaching programme, small game became the main source of protein (Vanwijnsberghe, 1996). It would be very difficult today to transport for sale all of the smoked meat from one elephant, which would consist of several hundred kg, due to the ecoguard road check points.

As for bushmeat transport routes, they seem to be almost the same today as in 1994, with 70% coming from Liouesso, although today the meat comes from further south, and also by the rivers Ngoko and Sangha.

In 1996, Malonga studying the bushmeat flow to Brazzaville markets found that elephant meat was very common, with 6,460 kg per year being sold that year. The largest amount was recorded during the closed hunting season. Finally, one of the more significant differences with the present study is the origin of elephant meat. Malonga (1996) stated that the Kouilou region in the south-west, bordering Gabon, provided almost the same amount of bushmeat (all species) as the northern area, using the railway as transport. The present study suggests that today bushmeat sold in Brazzaville comes mostly from the northern part of the country. It might be due to the improvement of roads and the public bus service in the north, while train service from Pointe-Noire to Brazzaville is deteriorating. When asked about this, Malonga (in litt., 2010) replied that in the late 1990s there were 28 trains a week (four a day) from Pointe-Noire to Brazzaville. Today there are only two trains a week and the train is not safe (robberies and accidents). The decrease might also be a sign of wildlife impoverishment and over-hunting in the Kouilou area.

In general, it appears that elephant hunting has decreased since the 1990s in northern ROC due mainly to the influence of the WWF-TRIDOM, WCS PROGEP and ECOFAC projects. It is uncertain if the government could sustain the current effort, limited as it is, without this external assistance.

Ivory

A review of previous research concerning ivory trade in ROC was conducted in order to compare with the little that was learned during this study to see if any trends could be perceived.

Brazzaville

Before the CITES ivory trade ban in 1989, the ROC was an important ivory exporting country. Importing countries

declared receiving 954.7 tonnes of raw ivory in the decade 1979-1988 from ROC, the fourth largest quantity on the continent (Luxmoore, et al., 1989). Meredith (1989) points out, however, that some of this originated in the DRC. Meredith stated that investigations indicated that high ranking personnel were involved in illegal ivory exports. Large quantities of ivory were smuggled out of northern ROC to the CAR or overseas via the Brazzaville airport 'by well organized gangs', facilitated by government officials (Meredith, 1989).

In 1989 there were 80 ivory carvers in Brazzaville and most of them belonged to registered 'artists' organizations. A Hong Kong Chinese trader established an ivory factory in Brazzaville in conjunction with a local company in the late 1980s (Meredith, 1989). Meredith estimated that 2,500-3,000 kg of ivory were consumed annually in manufacture. The raw ivory prices for Brazzaville in the late 1980s are given in **Table 18**. Prices varied according to whether they were official government prices or for black market ivory sold on the open market and whether destined for local carvers or export.

Ivory prices always vary considerably due to various factors, so the prices presented by all authors should be considered as average and approximate.

Madzou and Moukassa (1996) carried out a study of ivory in the Brazzaville Plateau arts market from August 1994 to August 1995. Most of the raw ivory used to manufacture objects originated from the north of the country and Ouesso and Mossaka were named as sources, along with ivory coming from the DRC via Bolobo. The number of ivory vendors varied from nine to 16 over this period, most of them West Africans. They purchased tusks that weighed less than 5 kg for FCFA 1,500-3,000 (US$ 3-6)/kg and tusks above 5 kg for FCFA 3,000-7,000 (US$ 6-14)/kg, depending on quality. If these prices are correct, it would show a significant decline in the price of raw ivory following the CITES ivory trade ban.

Madzou (1999) carried out a follow-up ivory study in August and September 1999. The number of ivory vendors in the Brazzaville Plateau arts market had dropped to only two, but the price of raw ivory had risen considerably. Tusks of less than 5 kg now sold for US$ 13.10/kg, 5 to 15 kg tusks for US$ 16.40/kg and more than 15 kg for US$ 24.60/kg (1 US$ = 610 FCFA). The fact that large tusks were now available in Brazzaville indicates that a shift in trade patterns had occurred. Local demand for worked ivory was very low, and it seems the price rise was due to two factors: a crackdown on ivory poachers and dealers in northern ROC, in which ivory had been seized and an ivory smuggling network disrupted, and the fact that a Japanese trader in Kinshasa, just across the Congo River from Brazzaville, was willing to buy any large consignment of tusks that arrived in Brazzaville. Therefore, there was concurrently a restriction of supply and increase in demand. Madzou stated that most of the raw ivory that made it to Brazzaville came from Sangha Province, in which part of the OKNP is found, specifically Sembé-Souanké to the north and Liouesso to the east.

OKNP area

Ivory prices in the rural areas in the 1980s are unknown at present, as no research on the question has been done. For the 1990s, Carpaneto (1994) gave a price of FCFA 7,000-8,000/kg for tusks above 20 kg in weight sold by hunters to middlemen in Mbomo and Etoumbi on the south-west edge of the OKNP. This price was before the devaluation of the CFA franc in 1994 and therefore would have equalled approximately US$ 28-32/kg (1 US$ = FCFA 250). Vanwijnsberghe (1996) interviewed several hunters in the western and south-western OKNP area from June 1995 to February 1996 with the ECOFAC project. He obtained prices in FCFA that translate to those shown in **Table 19.** The 1993 prices were adjusted for inflation using the GDP Inflator Index (http://cost.jsc.nasa.gov/inflateGDP.html) to estimate prices in 2009 US$ in the last column.

Table 18. Raw ivory prices in Brazzaville in the 1980s in US$/kg

Tusk weight Kg	Govt. All buyers '83-'85	Local open market '83-'86	Govt. export '86-'89	Govt. local market '86-'89	Local open market '86-'89
<5	16.66	10-11.60	-	16.66	16.66-26.66
5-10	30	11.60-23.33	100	30	26.66-30
10-15	46.66	-	126.66	46	-
15-20	60	-	150	60	-
>20	83.33	-	166.66	83.33	-

Source: Meredith, 1989.

Table 19. Raw ivory prices around the OKNP in the early 1990s in US$/kg

Tusk weight kg	US$ 1993	US$ 2009
<10	10	13.20
10-15	20	26.40
15-20	30	39.50
>20	40	52.70

Source: Vanwijnsberghe (1996)
NB: 2009 US$ prices obtained from GDP Inflator Index (http://cost.jsc.nasa.gov/inflateGDP.html) and rounded off.

Table 20. Raw ivory prices in Ntoku in 1999 in US$/kg

Tusk weight kg	US$ 1999	US$ 2009
<5	4.10	4.90
5-10	4.92-8.24	5.80-9.70
10-15	12.30-13.90	14.50-15.50
15-20	17.28-20.60	19-23
>20	24.60-28.78	27-32

Source: adapted from Nishihara 2002. (1 US$ = FCFA 610)

NB: 2009 US$ prices obtained from GDP Inflator Index (http://cost.jsc.nasa.gov/inflateGDP.html) and rounded off.

Vanwijnsberghe (1996) pointed out that killing one large elephant with a pair of 30 kg tusks could furnish FCFA 600,000 (US$ 2,400) in the early 1990s, which, when the meat was added, would result in a substantial windfall. Nishihara (2002, 2003) summarized the data collected by ECOFAC from 1996 to 2001 on elephant poaching and ivory trade around the OKNP and included research of his own. Tusk prices in Ntoku, about 140 km south-east of the OKNP on the river transportation route to Brazzaville (**Figure 10**), sold in 1999 for those shown in **Table 20**.

Carpaneto (1994) was one of the first to signal how the introduction of modern weapons into northern ROC in the early 1980s brought on a virtual carnage of elephants. Elders from one village near the OKNP recalled that in 1979 they used to obtain tusks of 36-37 kg, whereas in 1982-83, the biggest were 22-25 kg and in 1992-93 the heaviest found were not even 20 kg. Eves (2006) also documented a decrease in tusk size in the 1990s in a study of hunters and bushmeat exploitation in the Nouabalé-Ndoki National Park area north of the OKNP.

Modern weapons coupled with poverty, corruption and high raw ivory demand in eastern Asia resulted in a perfect storm for elephant disaster. However, Vanwijnsberghe (1996), Nishihara (2003) and Eves (2006) all documented how the introduction of conservation management projects in northern ROC in the 1990s reduced elephant poaching considerably, but the result was a significant drop in rural income from elephant meat and ivory. Vanwijnsberghe (1996) estimated that the monthly return on hunting per hunter was FCFA 14,610 (US$ 29.20) in one village and only FCFA 5,391 (US$ 10.80) in another, after elephant hunting had been controlled.

No raw ivory prices were obtained for Brazzaville in the current study.

Price data, when coupled with some knowledge of supply and demand conditions, are an excellent indicator of overall demand. It is demand for elephant products that is the prime determining variable influencing incentive to kill elephants, hence the attention given to it here. **Table 21** presents a summary of ivory price data over time for the OKNP area, which constitutes a changing incentive for hunters and middlemen. The GDP Inflator Index has been applied to all pre-2010 prices to estimate past prices in 2009 US$ (http://cost.jsc.nasa.gov/inflateGDP.html) to account for inflation and make all prices equivalent.

Nishihara's (2002) reported prices in Ntoku seem too low, but prices in Brazzaville in 1999 collected by Madzou (1999) are not inconsistent with them. The prices in the 1999 BZV column are those of Madzou (1999) with the

Table 21. Prices (in 2009 US$) for ivory sold by hunters in the north in US$/kg

Tusk weight Kg	1994	1996	1999 North	1999 BZV	2010
Tusk <5kg		13.18	4.90	15.60	5-20
Tusk 5-10 kg		13.18	5.80-9.70	19.50	10-40
Tusk 10-20 kg		26.37-39.54	14.50-23	19.50-29	20-40
Tusk >20Kg	36-41.30	52.72	23-32	>30	36-60

Sources: Carpaneto (1994), Vanwijnsberghe (1996), Nishihara (2002), Madzou (1999) and this study.

Table 22. Open market tusk prices in Brazzaville, 1983-1999 (2009 US$/kg)

Tusk weight kg	1983-1985	1986-1989	1996	1999
<5	17.30-20	26.50-42.50	3.70-7.40	15.60
5-10	20-40.30	42.50-47.80	7.40-17.40	19.50
>15	-	-	7.40-17.40	29.20

Sources: Meredith (1989), Madzou & Moukassa (1996) and Madzou (1999).

GDP Inflator Index applied. One could still make a profit transporting tusks from Ntoku to Brazzaville, although, oddly, for larger tusks the margin was small.

There is no discernable trend either up or down in ivory price data in the north between 1994 and the prices collected in this study in 2010. If the 2010 prices are correct, tusks today are selling in US$ prices, adjusted for inflation, not that different than in the mid 1990s, at odds with findings from the other country case studies in this project (Stiles, 2011). Future research will hopefully resolve the question.

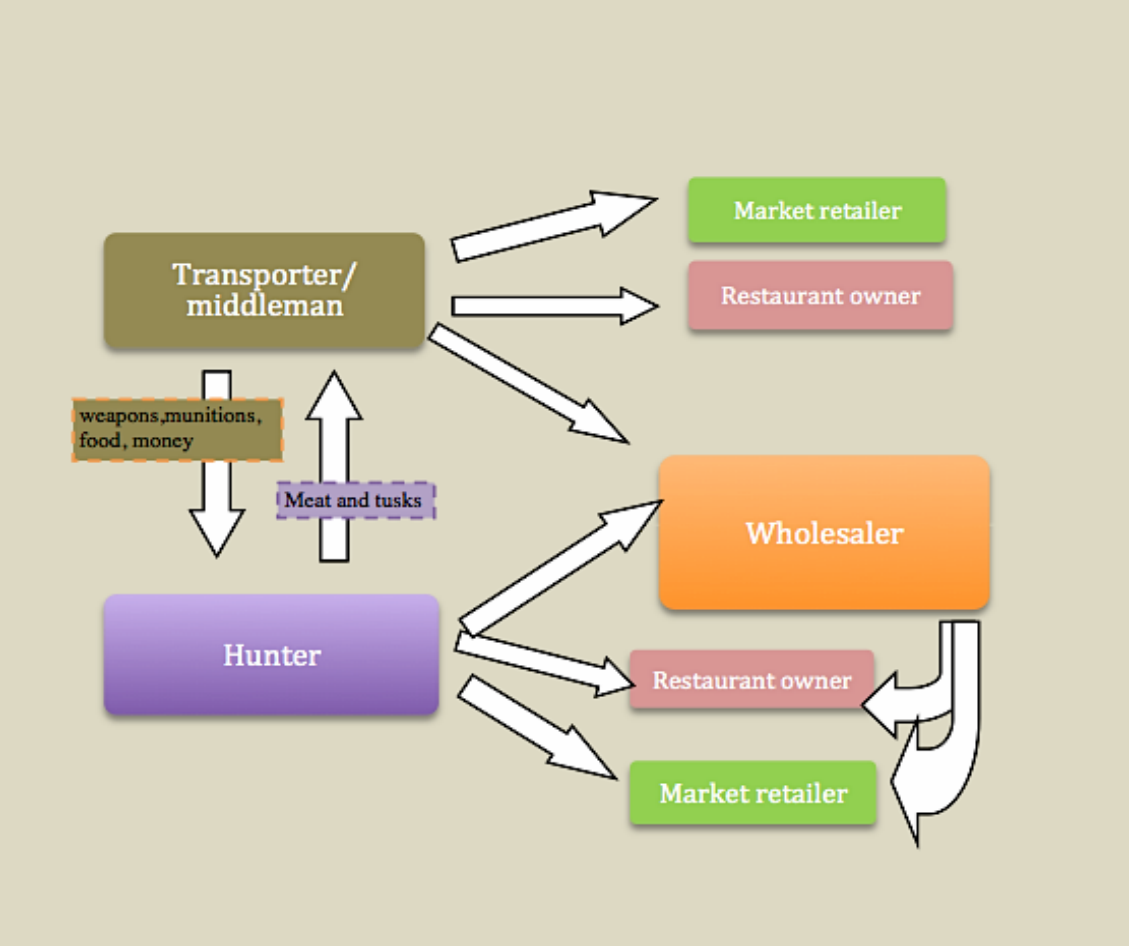
Table 22 presents the inflation-adjusted open market (i.e. black market) prices for tusks in Brazzaville from 1983 to 1999. The tusk weight classes are not ideal as they had to be adapted to the unorthodox method Madzou used in collecting tusk weight data.

The highest prices seen in Brazzaville were in the years leading up to the CITES ivory trade ban. Global demand was so high in the late 1980s that tusks over 10 kg in weight were exported rather than sold on the local market. As in other parts of Africa (Dublin & Jachmann, 1992; Stiles & Martin, 2000), tusk prices in Brazzaville fell in the 1990s (**Table 22**).

Research in this study suggests that the local worked ivory market has experienced a continuous decline since the 1980s and 1990s and today it has gone largely underground. Most of the tusks from elephants killed in the country, particularly in the north, are smuggled out through Cameroon. Recently, however, Chinese nationals have been apprehended in Pointe-Noire and Brazzaville trying to smuggle out raw and worked ivory to China (Anon., 2010; Anon., 2011).

Ivory displayed in the Pointe-Noire crafts market (Photo: S. Latour)

Figure 8. Commodity chain of elephant meat



Commodity chain

The diagram **(Figure 8)** presents the commodity chain of elephant meat. Reliable data concerning the ivory commodity chain could not be collected during the short study period, but the main difference would be that ivory heads to Cameroon with different actors than those involved in meat, which remains for the most part in ROC.

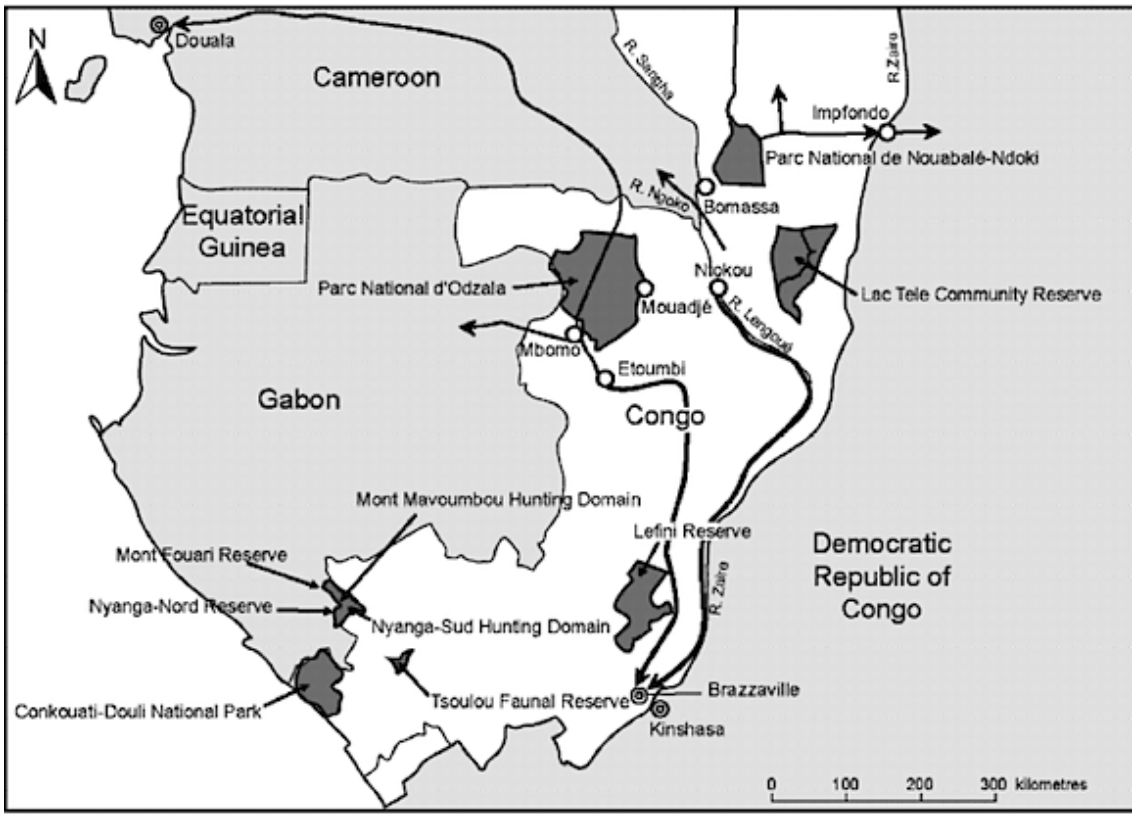
Transport and distribution

Nishihara (2003) presented a map of ivory transport routes in the late 1990s that is very similar to the current one (**Figure 9**).

Meat and ivory are transported by foot out of OKNP back to the home village of the hunters. The meat is consumed in the village and if there is surplus, some is sold. If there was a very large quantity of elephant, and perhaps other, bushmeat it can be sold to itinerant traders or passers-by. If the hunting was to the north of OKNP, the Ngoko River is often used to transport the hunt products by river to Ouesso to be sold.

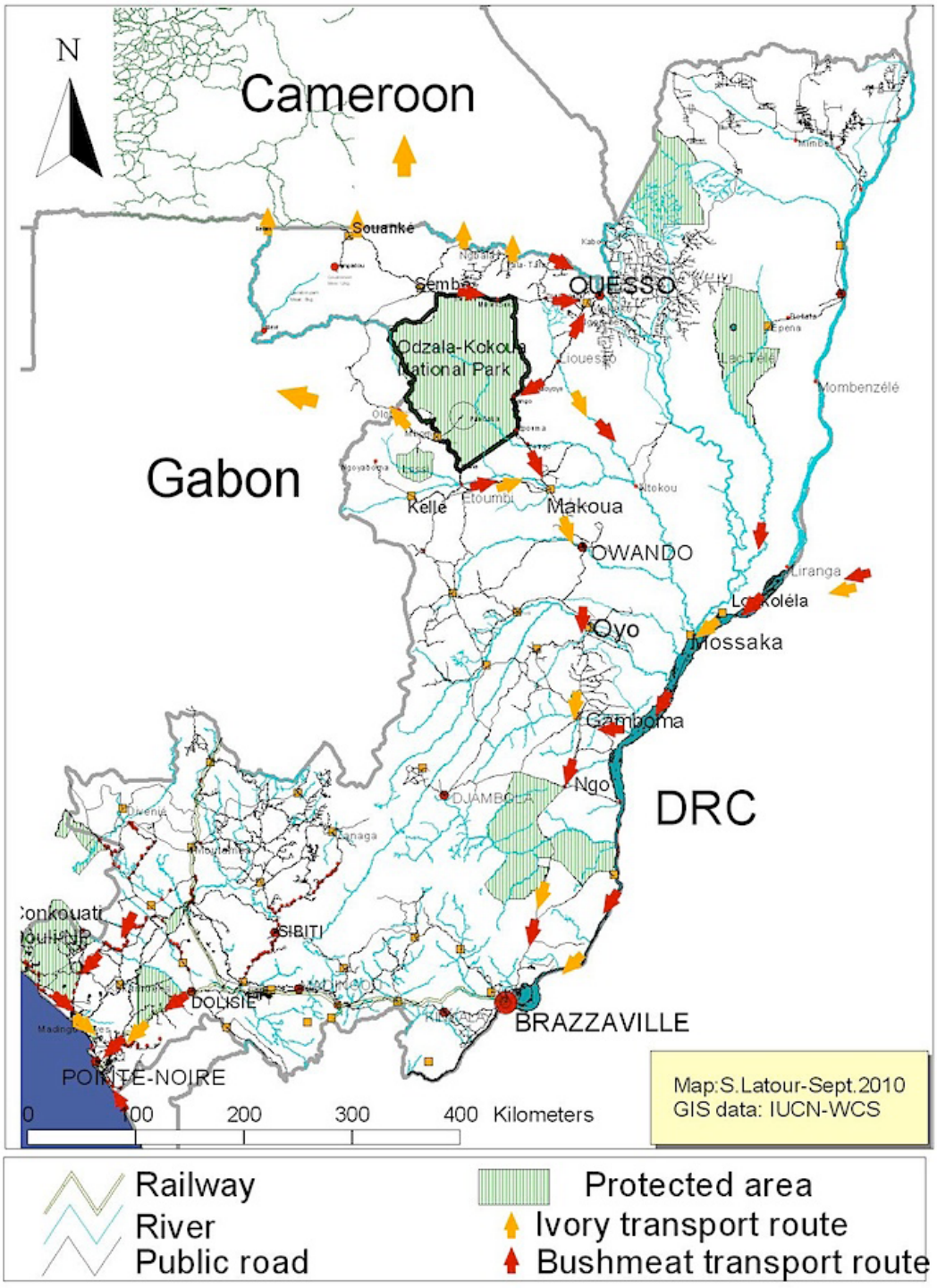
Figure 10 shows the transport routes for ivory and bushmeat in 2010, consisting of logging roads, public roads as well as the Congo River and smaller rivers (e.g. Likouala-aux-Herbes, Sangha, Oubangi and Motaba rivers). Air links are also used to transport bushmeat and ivory, mainly from the north to Brazzaville. It is also known that air links are frequently used to export bushmeat illegally from Congo to Europe. Chaber et al. (2010) gives an estimate of 580 kg of bushmeat carried per week on Air France flights from Brazzaville to Paris-Charles de Gaulle airport, although almost none of this included elephant.

Figure 9. Transport routes of Congolese ivory traffic in the late 1990s (Nishihara, 2003).



Hunters use passing trucks to transport bushmeat to market. (Photo: WCS)

Figure 10. Ivory and bushmeat transport routes



Conclusions

This pilot study resulted in gaining a better understanding of elephant meat trade in the ROC, as there are no previous studies focusing on this issue. Since elephant poaching is an illegal activity, data provided by informants must be considered with caution. In future studies of this kind, the methodology needs to be refined, RAs need to be trained in data collection and recording techniques and it would be greatly advantageous to have more time in the field to cultivate relationships with hunters, middlemen and vendors and to utilize participatory observation as a data gathering methodology.

The study found that both elephant meat and ivory are obtained on a regular basis from the OKNP, but that ivory is the main motivating factor in illegal elephant killing. Often, the meat is not even harvested, but left to rot, especially when far from roads in the forest. The meat that is taken is usually smoked and is used for subsistence by the hunters, with some traded in villages and eventually finding its way to Ouesso and on to Brazzaville by road, river or air. More research is required to determine the prices through the commodity chain, who is involved and the quantities involved. It is clear, however, that if demand for elephant meat rises, corruption in checkpoints persists and transportation becomes easier, that the bushmeat trade could seriously threaten elephant survival.

Policy Recommendations

The Poaching problem

Anti-poaching programmes and checkpoints in and around protected areas would not be functional without support from international NGOs. Government agencies are not only understaffed and sometimes poorly trained, but they also have to put up with unpaid salaries and economic problems that demoralize them and/or lead them to accept corruption. Abuse of power coming from other authorities, facilitating illegal wildlife traffic, is itself a factor that can demoralize ecoguards and MDDEFE officials by devaluing their work.

The profusion of military weapons – available for cheap prices or provided by government agents (policemen or military officers) – and cheap ammunition encourage poaching in general and elephant killing in particular. Carpaneto (1994), referring to the Mbomo-Mbandza area, confirmed that the emergence of more sophisticated war weapons in the early 1980s resulted in a genuine carnage for elephants.

The absence of alternative activities generating income, such as commercial farming or ecotourism, is also a factor encouraging hunting as a commercial and subsistence activity.

Finally, the presence of national, secondary and private roads, poorly controlled or not at all, promotes an intensification of hunting.

Law enforcement situation

The legislation of the country is strong enough and well adapted but its implementation is impeded by lack of financial and human resources, lack of political will and by corruption. Many arrested offenders are not taken to court, or when they are, they miraculously escape their sentence. The success of initiatives to support law enforcement such as PALF demonstrates that the law can be implemented, even with limited resources, if there is leadership. Successful prosecution of criminals, thanks to a team of national, motivated lawyers, also demonstrates to people that breaking the law can lead to serious legal consequences. This realization was noted during the study when talking with communities.

Finally, it is imperative to better inform the population concerned about national regulations that are often ignored or misunderstood in the areas of protected species, boundaries of protected areas, penalties that can be incurred, etc. This can be successfully done through interactive programmes such as those implemented by INCEF[3] in ROC. There is also a need to train law enforcement personnel to communicate effectively with communities concerning wildlife laws.

Elephant meat and ivory traffic

Due to the above factors, elephant poaching is an activity that can be profitable if ways to commercialize its products are accessible (roads and means of transport) and if there is demand (markets and customers). As long as the risks to offenders in using access roads and rivers and selling in markets are low and penalties incurred are slight and/or negotiable, trafficking remains extremely advantageous and will be difficult to stop.

It is very complex and expensive to curb poaching at its origins, which involves monitoring hunters and camps scattered across thousands of square kilometres of dense forest. However, it is feasible to control the trade at the 'bottleneck' of the chain, i.e. on access routes (roads and

[3] http://www.incef.org/

rivers) that must be used to market the goods. One of the first measures to be implemented is therefore increasing controls on these major routes and strengthening their effectiveness. Efficiency involves a reduction of corruption, a better enforcement of laws and a follow-up of convictions, which greatly depends on the Government's political will.

There remains a strong need to defend key elephant territories against poachers. This involves a high rate of patrols in elephant habitat (which is also often great ape habitat as well) and establishing networks of informers within local communities who can alert the authorities about illegal activities.

Concerning the international traffic, it is also important to strengthen airport controls in ROC and in countries of destination (Chaber, et al., 2010). Sniffer dogs could be used at airports (McConnell, 2009).

Table 23 summarizes the recommendations.

Table 23 - Problems and policy recommendations

Problem	Recommendation
Poaching	Reinforce capacity of MDDEFE to support anti-poaching
	Control proliferation and traffic of military weapons
	Develop alternative economic activities
	Improve roads surveillance
	Increase penalties for killing elephants
Law enforcement	Fight against corruption; take measures to ensure that the judiciary prosecutes wildlife trade offenders and penalizes them
	Support projects such as PALF
	Develop education programmes (cf. INCEF)
Elephant meat and ivory traffic	Drastic improvement of controls on all access routes
	Fight against corruption
	Raise funds to support improvement of ROC human resources and equipment
	Improve airport controls in ROC and in Europe (e.g. France)

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Appendix 1 – Questionnaires

CHASSEURS

1. Nom de l'enquêteur _____
2. Code de personne interviewée _____
3. Date _____
4. Ville/village de l'entrevue _____
5. Coordonnées de carte _____
6. Lieu de naissance _____

Identification

7. Âge (approximatif) _____
8. Sexe: Masculin / Féminin
9. Groupe ethnique_____
10. Profession(s) _____
11. Ville/Village ou vous habitez actuellement _____
12. Etat civile: Marié / Marié polygame / Célibataire / Veuve
13. Religion : Protestant / Catholique / Musulman / _____ Autre (spécifier)

L'abattage le plus récent

14. Site: a. Région _____ b. Aire protégée la plus proche _____
    c. Village le plus près _____ d. Distance au village _____ km
    e. Description du site d'abattage_____
15. Date de l'abattage _____
16. Nombre d'éléphants abattus, sexe et classe d'âge : a. Dernière mission _____
_____
_____
b. Quel est le plus grand nombre d'éléphants abattus en une fois depuis vos débuts de chasseur_____
17. Quantité de viande (et de quelle partie) consommée sur place_____
_____
_____

18. Viande transportée de _____ *(site spécifique)* à_____
19. Ivoire transporté de _____*(site spécifique)*à _____
20. Durée du voyage pour trouver, tuer, boucaner et transporter la viande/l'ivoire _____ jours
21. Distance approximative du trajet A/R _____ km
22. Nombre et type de participants:
    a. _____ membres de la famille
    b. _____ Amis de votre village
    c. _____ Amis d'un autre village(s)
    d. _____ Autre (précisez): _____

23. Méthode de chasse: _____
    Type fusil: _____
    Type cartouche: _____
    Nombre de cartouches utilisées: _____
    Coût d'une cartouche: _____
    Autre: _____

24. Si chasse au fusil, qui est le propriétaire de l'arme: _____

25. Classer par ordre d'importance les raisons de l'abattage d'éléphants : (1 = plus important, 2 = 2ème plus important, etc.)

a. _____ ivoire
b. _____ viande
c. _____ protéger la vie/les champs cultivés (conflit humain-éléphant)
d. _____ culturel _____ (description)
e. _____ autre _____ (précisez)

26. Type et quantité d'autres animaux pris pendant le voyage:

a. A vendre : _____
b. A consommer : _____
c. A partager : _____
d. Pour usage culturel : _____
e. Pour médicine : _____
f. Autre but (précisez) : _____

27. Ranger les modes de transport selon la fréquence d'usage (1 = le plus fréquent, 2 = 2ème, etc.)

a. ____ bus/car
b. ____ voiture particulière (propriétaire ?) _____
c. ____ véhicule gouvernemental (précisez) _____
d. ____ véhicule de société/association (spécifier) _____
e. ____ moto
f. ____ vélo
g. ____ à pieds
h. ____ pirogue

28. Quantité de viande d'éléphant transportée: _____ kg total ou autre mesure

a. ____ kg au marché
b. ____ kg vendus sur la route
c. ____ kg vendus à un abonné
d. ____ kg au foyer familial
e. ____ kg à partager avec autres foyers amis
f. ____ kg à vendre à un étranger

(Précisez si la viande est transportée fraiche ou boucanée).

29. Quantité d'ivoire transportée : nombre de pointes _____
kg total _____

30. Nombre de porteurs _____

31. L'acheteur de l'ivoire a (description)_____

b. Provenance (venant de quelle ville, quel pays, nationalité) _____

32. Autres parties d'éléphant transportées/utilisées (oreilles, poils, mâchoires, queue, nossements….)_____

a. kg ou nombre transporté au marché _____
b. Prix au kg ou à la pièce _____
c. kg ou nombre vendus à une personne connue_____ Qui _____
d. kg ou nombre vendus à un inconnu _____
e. kg ou nombre transporté au foyer _____
f. kg ou nombre donnés comme cadeau_____ Qui _____

33. Sites de vente de produits d'éléphant par le chasseur (marché, bureau, domicile, restaurant, gargote)

Description du site	Localisation du site	Type de produit vendu	Acheteur

Motifs économiques de la chasse aux éléphants

34. Prix d'un kg de viande (approximatif) _____ CFA / kg
35. Autre rémunération pour la viande (troc) _____
36. Prix d'un kg d'ivoire: pointe <5kg _____FCFA; pointe 5-10 kg _____FCFA pointe>10 kg _____ FCFA pointe >20Kg_____
37. Autre rémunération pour l'ivoire _____
38. Autres produits vendus ou utilisés _____
_____
39. Rémunération _____
40. Les contrôles des écogardes sont-ils un frein à votre activité _____
Dans les deux cas, expliquez pourquoi _____
_____

Transporteurs/Grossistes

1. Nom d'enquêteur _____
2. Code de personne interviewée _____
3. Date _____
4. Ville/Village de l'entrevue _____
5. Coordonnées de carte _____
6. Lieu de naissance _____

Identification

7. Âge (approximatif) _____
8. Sexe: Masculin / Féminin
9. Groupe ethnique_____
10. Profession(s) _____
11. Chasseur pour soi-même _____ ou pour commanditaire _____
12. Si commanditaire, qui (nom ou description) _____
13. Ville/Village ou vous habitez actuellement _____

14. Etat civile: Marié / Marié polygame / Célibataire / Veuve

15. Religion : Protestant / Catholique / Musulman / _____ Autre (spécifier)

16. Depuis quand transportez-vous/vendez-vous la viande/l'ivoire? _____

17. Viande transportée de _____ (site spécifique) à _____
18. Ivoire transporté de _____ (site spécifique) à _____

19. Voie utilisée (route publique, route de concession forestière, route de mine, piste, rivière, etc.)

_____

_____

_____

20. Durée du voyage _____ jours
21. Distance approximative du trajet _____ km
22. Nombre et type de participants:
    a. _____ membres de famille
    b. _____ Amis de votre village
    c. _____ Amis d'un autre village(s)
    d. _____ Autre (spécifier): _____

23. Dates d'approvisionnement en viande/ivoire: mois de _____ de l'année _____
24. Dates de vente de viande/ivoire : mois de _____ de l'année _____
25. Ranger les modes de transport selon fréquence d'usage (1 = le plus fréquent, 2 = 2ème, etc.)
    a. ____ bus/car
    b. ____ voiture particulière (propriétaire) _____)
    c. ____ véhicule gouvernemental (précisez) _____)
    d. ____ véhicule de société/organisation (précisez) _____)
    e. ____ moto
    f. ____ vélo
    g. ____ à pieds
    h. ____ pirogue

26. Quantité de viande d'éléphant transportée: _____ kg total
    a. ____ kg au marché
    b. ____ kg vendus sur la route
    c. ____ kg vendus à un abonné
    d. ____ kg au foyer familial
    e. ____ kg à partager avec autres foyers amis
    f. ____ kg à vendre à un étranger

27. Quantité d'ivoire transportée : nombre de pointes _____
    kg total _____
28. Nombre de porteurs _____
29. L'acheteur de l'ivoire a. Description_____
    b. Provenance (venant de quelle ville, quel pays, nationalité)_____

30. Autres parties d'éléphant transportées/utilisées (oreilles, poils, mâchoire, queue, ossements)

    _____

    a. _____ kg/nombre du produit au marché
    b. _____ prix kg/pièce
    c. _____ kg/nombre vendus à une personne connue Qui _____
    d. _____ kg/nombre vendus à une inconnue
    e. _____ kg/nombre transporté au foyer
    f. _____ kg/nombre donnés comme cadeau Qui _____

Sites de vente de produits d'éléphant par le transporteur/grossiste

31. (marché, bureau, domicile, restaurant, gargote, etc.)

Description du site	Localisation du site	Type de produit vendu	Acheteur

Motifs économiques

32. Prix de vente d'un kg de viande (approximatif) _____ CFA / kg

33. Autre rémunération pour la viande _____

34. Prix d'un kg d'ivoire: pointe <5kg _____FCFA; pointe 5-10 kg _____ FCFA pointe>10 kg _____ FCFA pointe>20Kg_____

35. Autre rémunération pour l'ivoire _____

36. Autres produits vendus ou utilisés _____

37. Rémunération _____

Fluctuations de prix de vente de viande de l'éléphant

38. Prix mensuel / kg

Jan	Fev	Mar	Avr	Mai	Juin	Juillet	Août	Sept	Oct	Nov	Déc
____	____	____	____	____	____	____	____	____	____	____	____

39. Prix à long terme

1990 prix moyen / kg	1995 prix moyen / kg	2000 prix moyen / kg	2005 prix moyen / kg
_____CFA	_____CFA	_____CFA	_____ CFA

Fluctuations du prix de l'ivoire

40. Prix à long terme pointe de 5-10 kg

1990 prix moyen /kg	2000 prix moyen /kg	2005 prix moyen /kg	2008 prix moyen/kg
_____FCFA	_____FCFA	_____ FCFA	_____FCFA

Détaillants

1. Nom d'enquêteur _____ 2. Code de personne interviewée _____

3. Date _____ 4. Ville/Village de l'entrevue _____

5. Coordonnées de carte _____ 6. Lieu de naissance _____

Démographiques

7. Âge (approximatif) _____

8. Sexe: Male / Femelle

9. Groupe ethnique_____

10. Profession(s) _____

11. Comment et avec qui avez-vous été initié au commerce de viande d'éléphant? _____
_____
_____ _____
_____

12. Ville/Village ou vous habitez actuellement _____

13. Etat civil: Marié / Marié polygame / Célibataire / Veuve

14. Religion : Protestant / Catholique / Musulman / _____ Autre (spécifier)

Source de la viande/ivoire

15. Décrire le fournisseur de viande/ivoire et l'endroit de l'achat _____
_____

16. Quantité de viande obtenue par semaine _____kg, par mois _____kg

17. Prix d'achat de la viande _____FCFA

18. Quantité d'ivoire obtenue par semaine _____kg, par mois _____kg

19. Prix d'achat d'ivoire: pointes <5 kg_____FCFA; 5-10 kg_____FCFA; >10 kg_____FCFA ; >20 Kg_____FCFA

Fluctuations des prix de vente de la viande de l'éléphant

20. Prix mensuel / kg

Jan	Fév	Mar	Avr	Mai	Juin	Juillet	Août	Sept	Oct	Nov	Déc
____	____	____	____	____	____	____	____	____	____	____	____

21. Prix à long terme (prix de vente du détaillant)

1990 prix moyen / kg	1995 prix moyen / kg	2000 prix moyen / kg	2005 prix moyen / kg
_____CFA	_____CFA	_____CFA	_____ CFA

Sites de vente de produits d'éléphant par la détaillante

22. (marché, bureau, domicile, restaurant, gargote, etc.)

Description du site	Localisation du site	Type de produit vendu	Acheteur

Consommateur

Enquêteur	Code personne interviewée
Date	Lieu

Détails sur le sujet

Age :	Jeune (<25 ans)	Adulte (25 – 50 ans)	Vieux (> 50 ans)

Sexe	Masculin	Féminin

Comportement du sujet	Très coopératif	Normal	Méfiant

Profession :	

Lieu de naissance :	

Groupe ethnique :	

Etat civil :	Marié(e)	Marié polygame	Célibataire	Veuf/veuve

Religion :	Catholique	Protestant	Musulman	Autre (précisez)

Situation économique (salaire mensuel)	Très riche (>1.000.000)	Riche (500.000 – 1.000.000)	Moyen (100.000 – 500.000)	Pauvre <100.000

Commentaires sur le sujet, son origine et sa situation économique

Habitudes alimentaires

1. Consommation de viande de brousse en général

Jamais	Rarement (< 1 fois par mois)	Régulièrement (1 à 3 fois par mois)	Souvent (>3 fois par mois)

2. Consommation de viande d'éléphant :

Jamais	Rarement (< 1 fois par mois)	Régulièrement (1 à 3 fois par mois)	Souvent (>3 fois par mois)

3. Quelle est la dernière fois où vous en avez mangé ?

4. Où mangez-vous le plus souvent cette viande ?

A Brazzaville	En brousse	A BZV et en brousse

5. Comment vous procurez-vous la viande d'éléphant ?

Achetée	Donnée	Consommée chez des amis	Consommée au restaurant	Autre :

6. Savez-vous de quelle région provient la viande d'éléphant que vous consommez ?

7. Pour quelle(s) raison(s) aimez-vous manger la viande d'éléphant ?

Goût	Santé (vertue)	Culturelle	Economique	Autre :

8. Quelle est la partie de l'éléphant que vous préférez manger ?

9. Utilisez-vous d'autres parties de l'éléphant pour d'autres usages (peau, oreilles, poils, queue..) et si oui, lesquelles et pour quel usage?

10. A quelle occasion mangez-vous de la viande d'éléphant ?

Sans motif particulier	Cérémonies	Fêtes familiales	Invités de marque	Autre :

11. Est-ce facile de trouver la viande d'éléphant à Brazzaville ?

12. Quels sont les marchés ou on trouve facilement la viande d'éléphant à BZV?

13. Quel est le ou les marchés où vous achetez la viande d'éléphant habituellement et pourquoi ?

<u>Aspects économiques</u>

14. Pour combien en achetez-vous habituellement ? (prix et/ou quantité) ?

15. Quel est le prix au Kg ?

16. Les prix varient-ils selon la saison ?

17. Les prix varient-ils d'un marché à l'autre (à BZV) ?

18. Les prix sont-ils différents d'il y a 5ans, 10 ans, 20ans ou plus ?

19. Si vous ne mangez jamais de viande d'éléphant, quelle en est la raison ?

Goût	Disponibilité (trop difficile à trouver)	Culture et religion
Prix (trop cher)	Santé (mauvais pour la santé)	Respect des lois (espèces protégées)

Expliquez si besoin est :

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