

Current status of the bonobo (*Pan paniscus*) in the proposed Lomako Reserve (Democratic Republic of Congo)

J. Dupain^{a,b,*}, E. Van Krunkelsven^a, L. Van Elsacker^{a,b}, R.F. Verheyen^b

^aRoyal Zoological Society of Antwerp, K. Astridplein 26, B-2018 Antwerp, Belgium

^bDepartment of Biology, University of Antwerp, Universiteitsplein 1, 2640 Wilrijk, Belgium

Received 1 April 1999; accepted 15 November 1999

Abstract

The creation of a 3800 km² forest reserve along the Lomako river (Equateur Province, Democratic Republic of Congo) is considered one of the main actions necessary for the conservation of the bonobo (*Pan paniscus*). We conducted a one-month qualitative survey in parts of the Lomako forest, in order to determine the presence of bonobos and the nature and degree of human disturbance. Results are based on information obtained by questionnaires at human settlements, direct evidence of human activities and forest visits in search of bonobos. There is still a rather large bonobo population in the south-central part of the Lomako forest, relatively free of hunting. However, the northern population seems to be decimated, except in the most impenetrable forest parts. The threats to the proposed reserve are twofold. First, the indigenous inhabitants of the Lomako forest have started intensifying commercial bushmeat hunting as an alternative to the loss of their agricultural economy. Secondly, an increasing number of commercial hunters are entering the area. In addition to the creation of the Lomako Forest Bonobo Reserve, we consider that support of local agriculture and the presence of researchers are the most important factors for the continued preservation of the local bonobo population by the indigenous inhabitants of the forest. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: *Pan paniscus*; Conservation; Hunting; Survey

1. Introduction

The bonobo, or pygmy chimpanzee (*Pan paniscus*), a species endemic to the Democratic Republic Congo (D.R.C.), is listed as highly vulnerable in the IUCN/SSC Action Plan for African Primate Conservation (Oates, 1986) and as endangered in the IUCN Red Data Book (Baillie and Groombridge, 1996). The species is officially protected by Congolese and international laws, and is listed in Appendix 1 of CITES and on Class A of the African Convention. Nevertheless, the overall bonobo population is thought to be declining rapidly, due to increasing pressures from the growing human population, erosion of hunting taboos, economic crises, political instability, and deforestation (Nishida, 1972; Susman et al., 1981; Kano, 1984; Sabater-Pi and Vêa, 1990; Kano, 1992; Thompson-Handler and Malenky,

1993; Pearce and Ammann, 1995). Unfortunately, very little is known about the exact distribution of bonobos within their potential overall range, which covers an area of about 840,000 km² (Thompson-Handler et al., 1995). There are a number of historical locality records available (Kano, 1984; Van den Audenaerde, 1984), some of which are unreliable. In 1973, Kano conducted the most extensive survey so far, covering 13,500 km² (Kano, 1984). More recent information is available from only a few small-scale surveys and from former or still-existing study sites (Thompson-Handler et al., 1995; Thompson, 1997; Furuichi et al., 1998; Dupain and Van Elsacker, 1999). In order to be able to make any realistic assessment of the status of *Pan paniscus* in the wild and consequently formulate a policy for future conservation, more surveys are needed (Lee et al., 1988; Malenky et al., 1989; Thompson-Handler et al., 1995).

One of the major conservation actions recommended in the “Action Plan for *Pan paniscus*” is the creation of a reserve in a 3800 km² forest block between the Yekokora and Lomako rivers (Thompson-Handler et al., 1995) (Fig. 1). A proposal has already been submitted

* Corresponding address. Tel.: +32-3-2024579; fax: +32-3-2024547.

E-mail address: bonobo@uia.ua.ac.be (J. Dupain).

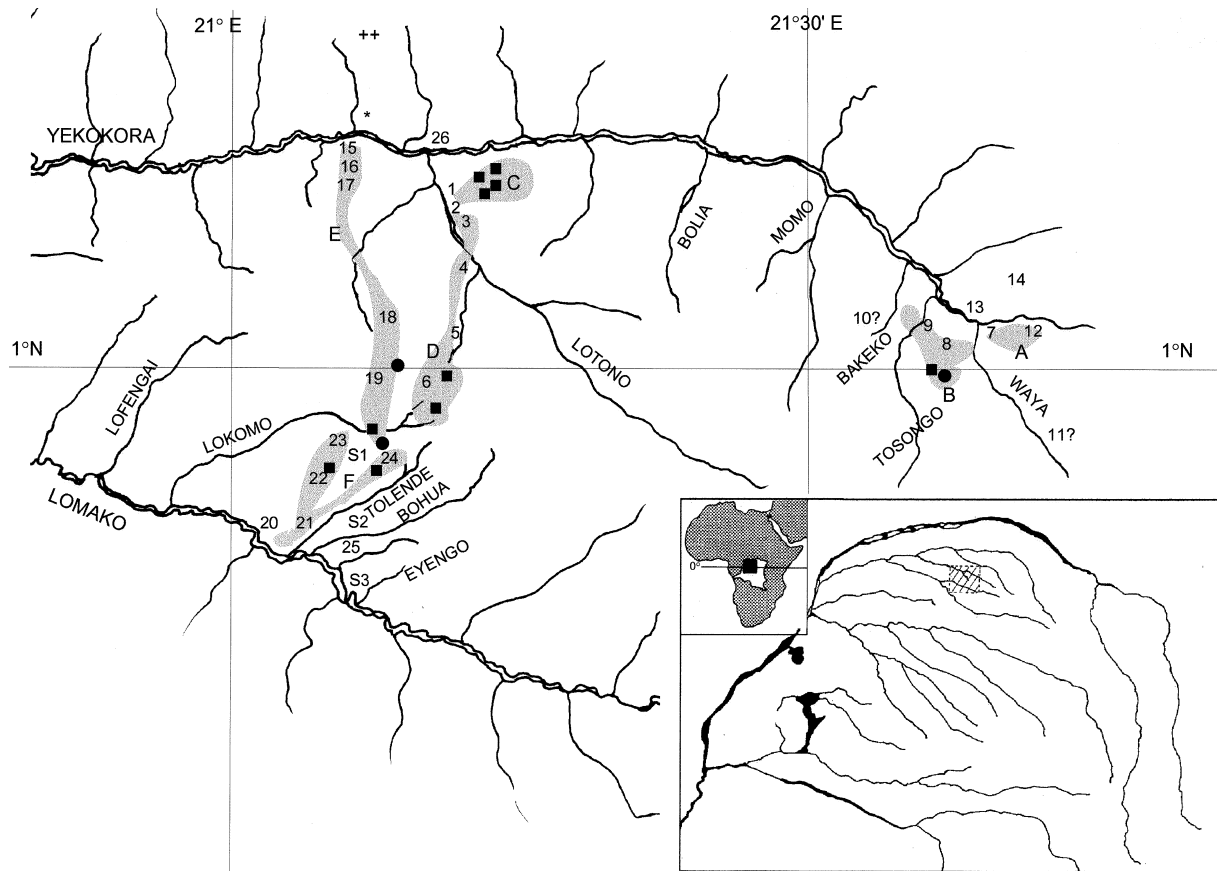


Fig. 1. Area of the proposed Lomako Forest Reserve. The small inset indicates the Democratic Republic Congo. The larger inset shows the distribution area of *Pan paniscus* and the location of the proposed reserve (///) therein. A–F: areas searched during forest visits (cfr. Table 1). 1–26: human settlements encountered during forests visits (see Table 2). ●, areas where bonobos were seen or heard; ■, areas where nests were found; *, market place; ++, timber yard; Research sites: s1, Iyema (Project Bonobo-in-Situ, 1995); s2, Mpako (Project Bonobo-in-Situ, 1994); s3, Isamondje (Project Pan, 1990)/Lomako (Lomako Forest Pygmy Chimpanzee Project, 1980).

by WWF-International to the Institut Congolais pour la Conservation de la Nature (ICCN) in 1990 and reached the ministry level in 1991, but has not yet been approved.

While the area seems to be an ideal location for the creation of a reserve in terms of natural borders, fauna present and the presence of scientific research sites, the status of the bonobo as well as the extent of human activity is well known only in and close to the bonobo research sites, situated close to the Lomako river and covering only 5% of the proposed reserve. The south-eastern region of the forest block is home to a permanent human population which is likely to impose severe hunting pressures on the local bonobo communities. The remaining northern part, comprising about 75% of the proposed reserve, is thought to be uninhabited (Hohmann and Fruth, pers. comm.) and, according to the people living in the southern part of the reserve, should harbour high densities of bonobos (pers. comm.). However, this area has never been surveyed by researchers. The Action Plan, therefore, emphasizes that, “prior to developing a reserve in Lomako, more

surveys are urgently needed between the Lomako and Yekokora rivers to confirm the presence of bonobos outside the area of the field station of the Lomako Forest Pygmy Chimpanzee Project and to assess forest quality” (Thompson-Handler et al., 1995, p. 66).

In 1995, the first and second author conducted a qualitative survey in the northern part of the proposed Lomako Forest Reserve with the aim of collecting information on the presence of bonobos (through direct and indirect evidence), as well as information on human activities in the area and their impact on the local fauna (through inquiry and observation of the local people). This survey was initiated with the aim of finding a suitable campsite for the Bonobo In Situ Project (Dupain et al., 1996).

2. Methods

In May 1995, the survey team (JD&EVK), accompanied by two local guides, travelled the Yekokora river by boat (proa), assessing the local occurrence of bonobos

Table 1
Direct and indirect evidence for the presence of bonobos, encountered during six visits to the proposed Lomako Forest Reserve in May 1995

	Visit					
	A	B	C	D	E	F
No. of days	1	3	2	4	3	2
Area searched						
Nest						
old ^a	–	1	57 (20)	17 (3)	5 (1)	7 (4)
new ^a	–	7 (1)	–	–	8 (1)	–
Food remains						
old:	2	5	> 10	3	–	5
new:	1	1	–	2	1	1
Faeces	–	–	2	–	–	–
Footprints	1	1	> 10	–	2	3
Vocalizations	–	1	–	–	1	–
Visual contact ^b	–	1 (4)	–	–	1 (> 10)	–
activity		Forage			Forage	
Reaction		Flee			Approach	

^a Numbers in parentheses indicate the number of nest groups.

^b Numbers in parentheses indicate the estimated party size.

through interviews with local people who are very familiar with the species. We interviewed the inhabitants of 18 different settlements, 12 within the proposed Lomako Reserve. In four localities, where interviews had indicated the possible presence of bonobos, we erected a temporary campsite, from which we made six forest visits (A–F), totalling 15 days and covering about 300 km (Fig. 1 and Table 1).

2.1. The interviews

We did not use a formal questionnaire but, instead, gathered information during long conversations with all inhabitants present. We identified the peoples' origin, the permanent or temporary nature of the settlement and the period of establishment in the area. Furthermore, we asked about the presence of bonobos in general, number of recent encounters with them and direction and distance of the encounters from the dwellings. Using this information, we decided upon the extent and direction of our forest visits. Finally, we also gathered information on the peoples' livelihoods, the presence/absence of cultivated fields, their hunting strategies with special reference to bonobos, whether they ate bonobos themselves and their knowledge of hunting camps. Twice, we accompanied them to a bushmeat market place.

2.2. The forest visits

The forest visits consisted of dawn-to-dusk walks accompanied by a local guide. We followed small trails, or zigzagged through the forest. No line transects were

used. Forest types were roughly recorded as dry rainforest without dense herb-shrub layer, dry rainforest with dense herb-shrub layer (mainly *Haumania*), permanently flooded swamp forest, and a drier type of swamp forest. Indirect evidence for the presence of bonobos was recorded, including nests, food remains, faeces, and footprints. Nests were classified as old or new according to freshness. We also closely examined fruit-bearing trees and food remains among the bonobo's food repertoire [as listed by Sabater-Pi and Veà (1994) and based on our own observations] for evidence of use by bonobos.

The geographical position of points of interest (sources, rivulets, small human paths, hunting camps, observation sites and nests) was determined using the Magellan GPS Nav 5000DLX, wherever the canopy allowed the reception of satellite signals.

3. Results

3.1. The forest

The vast majority of vegetation was dry rainforest with trees of all layers growing thickly over a relatively thin herb-shrub layer. One area, however, was covered with dense undergrowth, mainly *Haumania liebrechtsiana* (indicated by C in Fig. 1). The Lomako and Yekokora rivers are bordered by permanently flooded swamp forest. Patches of secondary forest are found mainly close to the Lomako river. Many rivulets run criss-cross through the forest block, most of these small streams fringed with a drier type of swamp forest. Small cultivated fields surround the permanent human dwellings.

3.2. Evidence for the presence of bonobos

All people interviewed reported the former or current presence of high densities of bonobos throughout the Lomako forest block. Table 1 lists direct and indirect evidence for the presence of bonobos, recorded during the six forest visits. The majority of evidence for the presence of bonobos was encountered south of 1°02'N (Fig. 1). Direct encounters with bonobos occurred only during visits B and E. During visit B, the bonobos were extremely frightened and fled upon our arrival but during visit E the animals approached us and stayed until we left.

Indirect evidence for the presence of bonobos was found to varying degrees during all forest visits. Except for an old nest and two localities where food remains were found, all indirect evidence for bonobo presence during visit B was encountered close to where they were observed and should be considered a single piece of evidence. Localities with direct and indirect evidence for the presence of bonobos encountered during visit E

were dispersed over the entire searched area and can be considered as separate pieces of evidence.

During visit A, we encountered only a few signs of bonobo presence. During visit C, we discovered a high density of nests close to the Yekokora river. These were located in a nearly impenetrable part of the forest which, due to the density of the undergrowth, local people have only just started to exploit. During visits D and E, nests, food remains, footprints, faeces and bonobos were found only as we came close to the Lokomo river, and no evidence was found north of 1°02'N. All evidence during visit F was found north of 0°53'N where nests, food remains, and footprints were encountered over a dispersed area.

3.3. Human populations

Although officially no permanent dwellings are located within the proposed Lomako Reserve, we found substantial evidence of human presence (Table 2). The human population within this region consists of three groups that each inhabit a different region of the forest

block: two ethnic groups (the Ngombe and Mongo) and one religious sect (the Kitiwalists), which includes people of different ethnic groups.

The area proposed for the development of the Lomako Reserve is the traditional homeland of the Mongo people (Van der Kerken, 1944) who inhabit officially recognized villages lying 20–30 km south of the Lomako river or north of the Yekokora river, as well as a number of unofficial permanent dwellings along both rivers. They are primarily farmers and hunted for their own consumption, mainly through the use of snares. Recently, however, they have tended to establish more dwellings in the Lomako forest and to focus more on commercial hunting activities. The northern region is inhabited by the Ngombe ethnic group. These people are primarily hunters using snares, poisoned arrows, guns and often trained dogs. People from all “Ngombe-settlements” except for Settlement 26 (Sombamela: Table 2) reported themselves to be bushmeat-traders. They sell meat to employees in nearby lumber companies and at the downstream markets of Basankusu, Mbandaka and Kinshasa. We found evidence for an

Table 2
Human settlements encountered during the survey^a

Name	Ethnicity ^b (<i>n</i>) ^c	Type of settlement ^c	Cultivated fields	Interviews conducted	Bonobos hunted and/or eaten
1 Bompombi I	N (10)	P	Yes	Yes	Yes
2 Bompombi II	N (10)	P	Yes	Yes	Yes
3 Bompombi III	N (10)	P	Yes	Yes	Yes
4 Kombilongo	N (5)	P	Yes	Yes	Yes ^d
5 Paris	N (4)	T	No	Yes	Yes
6 Belgique	N (0)	T	No	Yes	Yes
7 Bokotombolo	N-K (5)	T	No	Yes	Yes
8 Bakumu	K (0)	T	No	No	? ^f
9 Papa Mongo	K (0)	T	No	No	?
10 Bakeko	K (?)	T	No	No	?
11 Waja	K (?)	T	No	No	?
12 E. Bokotombolo	K (0)	P	?	No	?
13 Itendele I	M (?)	P	Yes	Yes	No
14 Itendele II	M (75)	P	Yes	Yes	No
15 Sukiananganda	N (0)	P	Yes	Yes	Yes
16 Bongengo	N (30)	P	Yes	Yes	Yes ^d
17 Bamanga	N (30)	P	Yes	Yes	Yes ^d
18 Lokomo II	? (0)	T	No	No	?
19 Okendekolo	? (0)	T	No	No	?
20 Bosolomwa	M (20)	P	Yes	Yes	No
21 Beila	M (5)	P	Yes	Yes	No
22 Toboy Makambo	M (3)	T	Yes	Yes	No
23 Iyemba	M (3)	T	Yes	Yes	No
24 Tolende	M (2)	T	No	No	?
25 Bohua	M (20)	P	Yes	Yes	No
26 Sombomela	N (2)	T	No	Yes	Yes

^a Numbers of the settlements in this table correspond to the numbers indicated in Fig. 1.

^b N = Ngombe, M = Mongo, K = Kitiwalist.

^c P = Permanently-occupied settlement; T = Temporarily-occupied settlement.

^d Inhabitants of these settlements showed us bonobo meat.

^e Estimated number of inhabitants at time of visit.

^f Information on this subject could not be obtained.

additional number of Ngombe hunting camps along the Yekokora and its tributaries (Bolia, Momo and upstream Lotono). At three settlements (numbers 4, 16 and 17), we were shown smoked bonobo meat. The Ngombe are gradually moving and hunting southwards, leaving behind impoverished forests.

The eastern part of the planned reserve is inhabited by the Kitiwalists whose hunting activities and strategies are comparable to those of the Ngombe people. Moreover, since these people do not accept the Congolese laws and do not tolerate “strangers”, it is difficult to achieve interviews with them (pers. obs.). We heard gunshots and encountered Kitiwalists during visit B. Official representatives of the Kitiwalists visited our temporary base camp during visit B and declared the forest to be theirs. These people are steadily expanding westward, as is indicated by the very recent Settlements 9–11 (Table 2, Fig. 1).

The market place that we visited (Fig. 1) is an important economic centre for the people living in and around the proposed Lomako Reserve. It serves as a meeting point for the people of the three groups mentioned above and employees of the lumber company active north of the Yekokora. Manioc and smoked bushmeat, as well as live bonobo infants, are exchanged for clothes, soap, bullets, medicines, and other goods. During our forest visits, we crossed a number of paths coming from the east and the south, linking the various settlements to the market place.

4. Discussion

4.1. Presence of bonobos within the proposed Lomako Reserve

The vegetation of the Lomako forest block in general seems to correspond with the description of White (1992), consisting principally of dry primary forest. This is the type of habitat bonobos prefer (Horn, 1975; Kano, 1984). However, in the area searched during visits E and F, a 40 km strip at about 21°05', evidence for the presence of bonobos was found only in the area near the Lokomo river. Nevertheless, all interviewed inhabitants of settlements within this strip stated convincingly that they had seen and heard bonobos on a nearly daily basis at the time of their establishment in the area. The results of these interviews, along with information on the sources of bonobo-meat and captured infants, strongly suggest that bonobos must have occurred in high densities throughout the proposed reserve area until recently. From the evidence encountered during our survey and information on human hunting patterns, we further conclude that bonobos still occur in high densities in the south-central part of the proposed Lomako Reserve. This was confirmed during the stay of

the first author at the Iyema campsite in 1998. This area is relatively free from human hunting activities. In the northern part, however, only a small population of bonobos remains, although higher densities may occur in the most impenetrable parts of the forest. Our evidence from direct encounters showed that these northern populations are extremely frightened of humans, which suggests a high hunting pressure in the area.

In the south-central part, estimated bonobo densities are between 1.1 and 3.46 individuals per km² (Thompson-Handler et al., 1995) and 2.36 ind/km² (Dupain et al., 1996). Density estimates for the northern part are not available. If one assumes that the population was once uniformly distributed throughout the entire forest block, the proposed reserve should theoretically be capable of containing about 8000 bonobos. This would be a major part of the overall bonobo population, which is estimated at 15,000 individuals (Pearce and Ammann, 1995). However, our survey suggests that the status of the bonobo in this forest block is no longer secure. The various threats to the populations originate from several sources. It is important to consider each of these sources in order to arrive at a feasible conservation plan.

4.2. Threats

4.2.1. Loss of agriculture

Until recently, the indigenous inhabitants of the Lomako forest, the Mongo people, lived primarily on farming. They raised their crops (coffee, maize, cacao, and rubber) on plantations surrounding their natal villages south of the Lomako river, and they used the temporary riverside dwellings to hunt and fish for their own consumption. However, due to the deterioration of the economy, roads and the river transport system, only a few merchants from Kinshasa still travel the Maringa river in order to buy crops from the peasants in the interior. The people are therefore no longer certain that they will be able to sell their crops. In order to survive nowadays, many villagers are migrating in small groups into the forest, where they make permanent settlements, start small-scale cultivation, and hunt for their own consumption. The human population in the southern part of the proposed reserve is now estimated at about 0.4 individuals/km² (pers. obs.) and is still growing. This tendency towards re-immigration into the forest from the more densely-inhabited border areas due to deteriorating economic prospects, is a general phenomenon throughout Congo and other parts of Africa (MacGaffey, 1991; Pearce and Ammann, 1995; Goodall, 1996). Consequently, human hunting pressure is increasing in this previously almost undisturbed bonobo habitat.

At present, the Mongo people still rarely hunt bonobos. This is supported by the fact that the bonobos we encountered near the Lokomo were not frightened by our appearance, and that we found indirect evidence for

the presence of bonobos close to temporary Mongo hunting camps. However, bonobos have become victims of snare injuries from the increasing number of traps set for other terrestrial mammals (Thompson-Handler et al., 1995; Mendoza, pers. comm.). Moreover, commercial exploitation of the forest is becoming much more lucrative than farming. The drastic increase in commercial hunting activities may lead to the detriment of the forest resources upon which the people depend (Hart, 1978; Noss, 1995).

4.2.2. *Intrusion of commercial hunters*

People belonging to the Ngombe ethnic group and to the religious sect of Kitiwalists are intruding into the traditional Mongo homeland from the north and the east respectively. Both groups have established permanent settlements within the proposed reserve only recently. Living almost exclusively on commercial hunting, they exert a high hunting pressure on the local fauna. Within the hunters' range of action, traces of bonobos were difficult to find, as were traces of the other regional primate species, except in areas not yet exploited because of difficult accessibility. If encountered, bonobos and any other primates were extremely frightened of humans. The Ngombe hunters effectively demolish the faunal resources upon which the local Mongo people depend. They have declared they will have to move further south to find new undisturbed hunting areas. The Mongo people interviewed were conscious of these devastating activities, but as they feel inferior to the "intruders", they do not counteract their advance.

Hunters are also entering the proposed reserve area from the west, by way of former lumber roads (Chambers, pers. comm.; pers. obs.). A lumber company was formerly active in an area west of the proposed Lomako Reserve, but abandoned its concession in 1987 (Thompson-Handler et al., 1995). Its old logging roads, however, have greatly improved access to the forest (Wilkie et al., 1992; Oates, 1994; pers. obs.).

4.3. *The bushmeat market*

Bushmeat has a high value in the larger cities of the Democratic Republic of Congo. The hunters of the Lomako Forest transport bushmeat as far to the west as Basankusu or even Mbandaka (pers. obs.). Transport to Kinshasa is also made possible by means of lumber company boats. Until the end of 1998, a lumber company was active in an area north of the proposed Lomako Reserve. Through the companies' boats, the hunters in the remote forest could supply the people in Kinshasa. The employees of the lumber company act as intermediaries. They trade such basic commodities as soap, clothes, medicines, and bullets, all imported from Kinshasa, for bushmeat and pets, which can be used for

their own consumption or sold for a large profit in the capital. In this way, the lumber company created favourable market opportunities for enterprising hunters and was responsible for a real hunting bonanza (Pearce and Ammann, 1995). Due to the current political instability in the D.R.C., all logging companies stopped their activities.

Even in the absence of logging, hunting pressures would form a serious threat (Kano and Asato, 1994). Some merchants have set up systems for the transport of bushmeat and pets that reach hunters in even the most remote areas.

4.4. *Possible actions*

4.4.1. *Agriculture*

The local Mongo people clearly expressed their preference to remain in their natal villages, but to satisfy their basic needs they need to be able to sell their crops. This can be accomplished by restoring the link between the merchants and the people in the interior. The "Bonobo-in-Situ Project" (Royal Zoological Society of Antwerp, Belgium) plans to set up an agricultural project that again assures the sale of the villagers' coffee and maize crops. This can be accomplished by assigning an intermediary, who informs the people when the merchants' boats are approaching, so that the peasants can bring their crops to the river borders. Furthermore, this intermediary can help peasants in negotiating a fair price for their goods. In this way, we hope to stop the spontaneous migration into the forest and the growing importance of commercial bushmeat hunting. It should be emphasized that this project was designed at the request of the local population itself.

4.4.2. *Presence of researchers*

The presence of researchers represents an effective way of protecting the bonobo population (Badrian and Badrian, 1977; Thompson-Handler et al., 1995; pers. obs.). It is vital that the local people are involved in the research project and one should be aware of and respect their traditional understanding of the land (Goodall, 1996).

As the villagers become aware of the economic advantages brought about by the presence of research teams (the agricultural project, hiring of local population for participation in research projects, etc...), it will also become in their interests to protect bonobos. Upon the arrival at the research site Iyema in 1998, we did not find any evidence of hunting practice despite two years of absence: none of the primates showed fright reactions during first encounters (pers. obs.).

Furthermore, awareness of its economical value will encourage the traditional owners of the forest to oppose the illegal (according to both Governmental and traditional laws) encroachment of immigrants (pers. exp.).

4.4.3. Creation of the Lomako Forest Bonobo Reserve

In 1996, the subject of “The Lomako Forest Bonobo Reserve” was again brought to the attention of the Congolese authorities. One can make the criticism that a reserve on paper will hardly succeed in protecting the bonobo in a country where the law is rarely enforced. According to Hart and Hall (1996), however, this legal status is relevant. Despite high human pressures in the Kahuzi-Biega park, for instance, they could report higher densities of large mammals inside than outside the park. Of course, the need for a sounder infrastructure and more incentives for the Congolese people to protect their wildlife must be emphasized.

4.4.4. Other fields of action

The owners of the lumber companies should be encouraged to make efforts to diminish the transport of bushmeat on their boats. In January 1998, Ammann collected evidence that the lumber company active north of the Lomako forest had a stimulating effect on the bushmeat trade (Ammann, 1998). Thereupon, the company immediately promulgated a ban to transport bushmeat on the logging boats, which caused a drop in hunting activities and bushmeat transport related with this company (pers. comm.). However, the employees will continue their consumption of bushmeat unless they are provided with alternative sources of protein (Pearce and Ammann, 1995).

4.5. The situation in 1999

Because of the ongoing war and the concomitant danger of meeting soldiers, most villagers living in or near the Lomako Forest refrain from entering the forest. Moreover, hunting for bushmeat trade is discouraged by the harassment behaviour of soldiers who take the merchandize without paying properly. Carrying guns or cartridges and trading of cartridges is usually allowed only to soldiers. These are the most effective tools, especially for bonobo-hunting. In general, based on our own observations in 1997 during the take-over by Kabila and in 1998 during the still continuing war, we suspect that hunting pressures in the Lomako Forest have temporarily diminished.

5. Conclusion

The proposed Lomako Reserve has a high potential for successful protection of the bonobo. Yet, with each passing year, this potential shrinks increasingly rapidly. The bonobo population is suffering from a quickly growing hunting pressure, which is only temporarily reduced by the current war conditions. The same holds for the rest of the fauna, which contains seven other species of primates: *Cercopithecus ascanius*, *C. neglectus*,

C. wolffi, *Cercocebus aterrimus*, *Colobus angolensis*, *Galago demidovi*, and *Allenopithecus nigroviridis* (Thompson-Handler et al., 1995). Also in urgent need of aid are such protected species of wildlife as the endemic Congo peafowl (*Afropavo congensis*) (Dupain et al., 1996), the golden cat (*Felis aurata*), the water chevrotain (*Hyemoschus aquaticus*), and the giant pangolin (*Smutsia gigantea*). Obviously, the conservation potentials of the proposed reserve are not limited to bonobos, but actions must be taken as soon as possible. We feel that, when combined with the integration of the needs of local people, the presence of research teams and agreements with the lumber companies, the creation of the Lomako Forest Reserve is likely to present an effective mean for the preservation of the bonobo in this area.

Acknowledgements

We thank the Ministère de la Recherche Scientifique et Technologie (Democratic Republic of Congo) for the “autorisation de recherche” and the Ministère de l’Intérieur (Dem. Rep. of Congo) for the “ordre de mission”. This research was conducted under the authority of the Royal Zoological Society of Antwerp (Belgium) and with the essential financial support of the KBC. Further financial help was provided by the Bonobo-EEP members (Apenheul, Kóln, Twycross). Special thanks for all logistical help go to the Belgian Embassy in Congo-Kinshasa, Mr. Heuts (Section Belgian Cooperation), CDI-Bwamanda (Kinshasa), the missionaries of MillHill (Basankusu), Procure Saint-Anne (Kinshasa) and the NGO Amis des Animaux du Congo (Kinshasa). The survey would have been impossible without the guidance and help of Lokuli Lofete Mawa and Jean-Pierre Longongo Boseko. Finally, we thank Kristel De Vleeschouwer and B.N.K. Davis for improving the English text and Mia de Meersman for help with the illustration. I am grateful to B.N.K. Davis and two anonymous reviewers for all extensive and constructive comments on the manuscript.

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