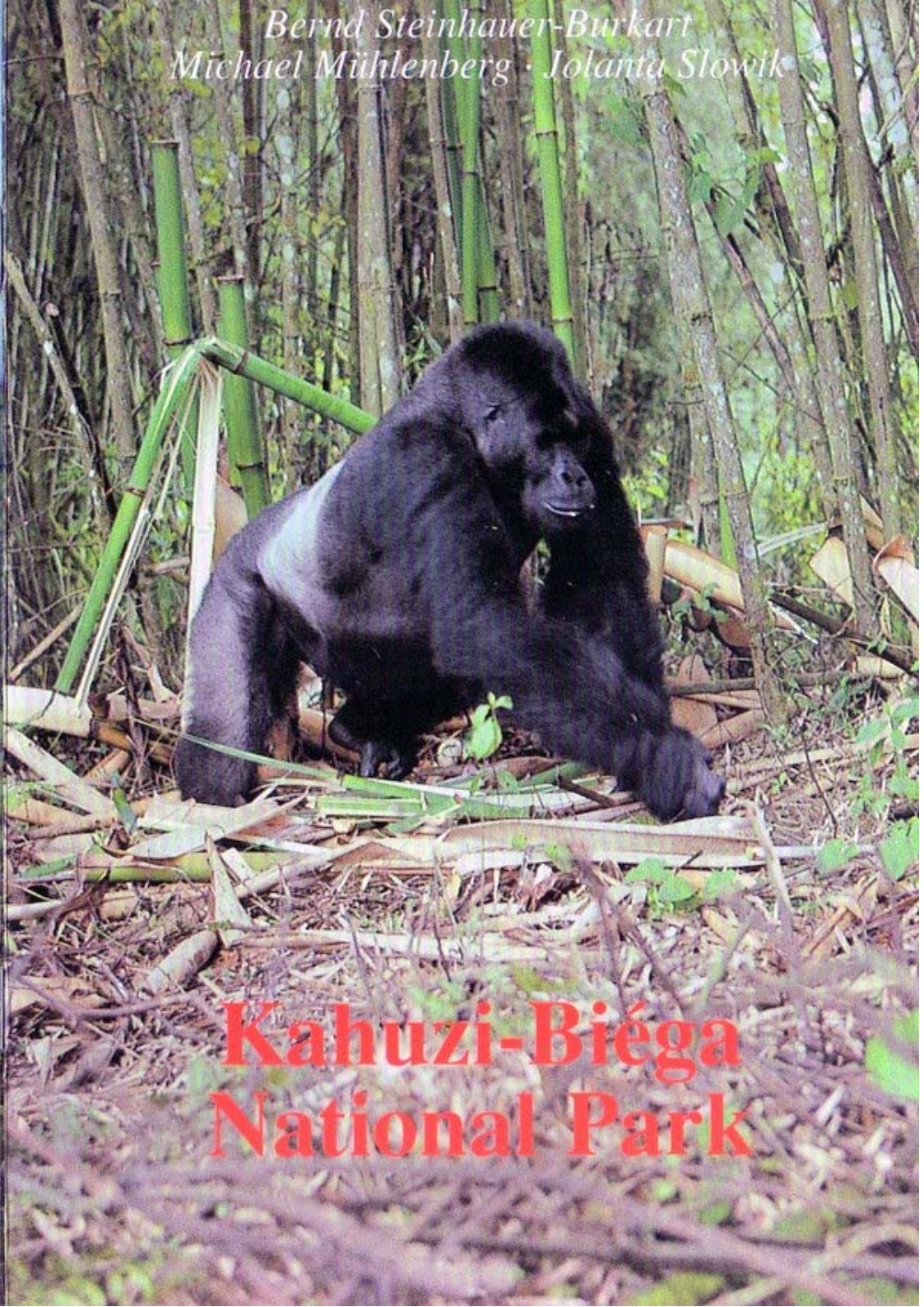


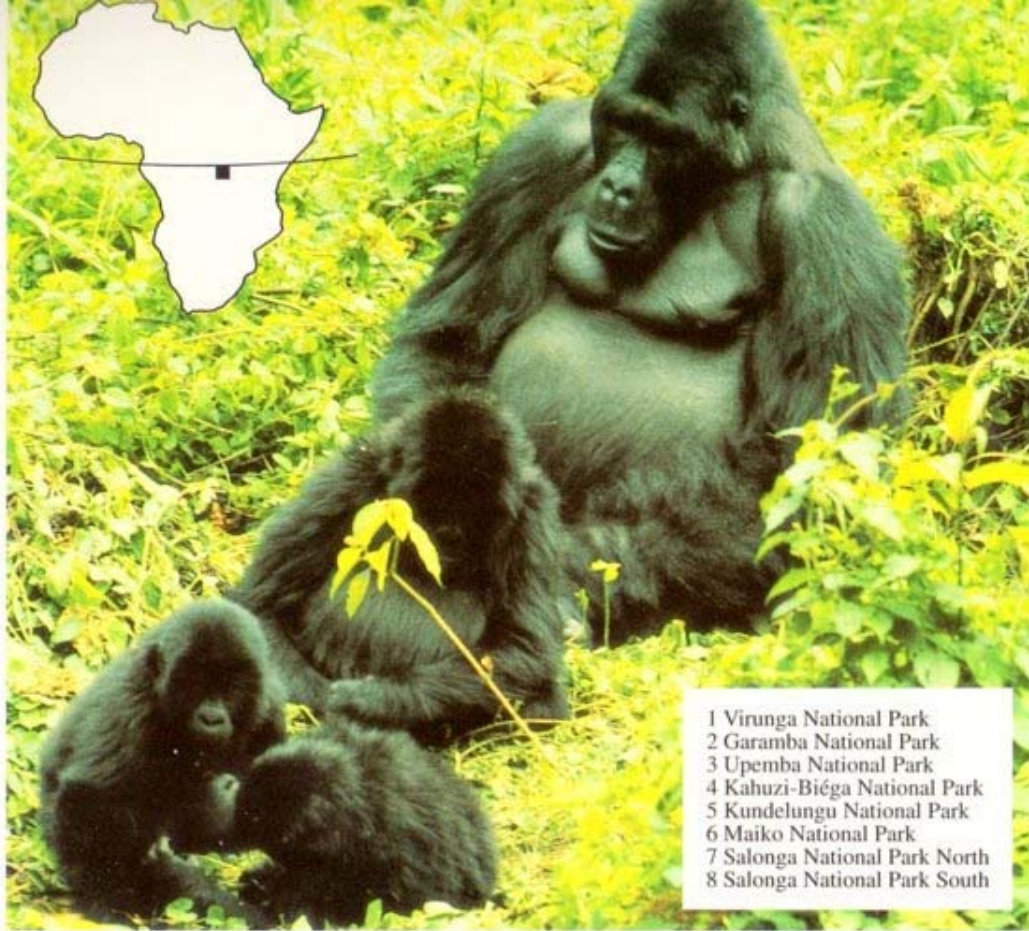


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Kahuzi-Biéga National Park

Published by the IZCN/GTZ-Project
"Integrated Nature Conservation in East-Zaire"



- 1 Virunga National Park
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- 7 Salonga National Park North
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Zaire has seven national parks with a total area of 77000 km². The Kahuzi-Biéga National Park (KBNP) was gazetted in 1970 to conserve the eastern lowland gorillas. It covers an area of 6000 km² and protects a mountain forest in the Kivu, which is the most densely populated region of the country. This park is divided into two zones that are connected by a narrow corridor: on one side there is mountain forest covering 600 km² from an altitude of 1800 m to 3300 m and on the other side is tropical forest between 600 m and 1200 m. The KBNP therefore is one of the biggest reserves serving to conserve flora and fauna of Central Africa's high mountain regions.



INTRODUCTION

At the first international congress on African tourism that was held in Bukavu in 1939, A. J. MOELLER DE LADDERSOUS predicted the following: "Just as the Alps became the recreation area of Europe from the moment when they were 'discovered' by the British tourists, the Kivu will one day become the recreation area of Africa."

Today, more than half a century later, I completely agree with this eminent and far sighted author. Kivu, agricultural and tourist region of eastern Zaire, is home to two important National Parks, Virunga National Park and Kahuzi-Biéga National Park, and has become the main target of gorilla tourism, especially since the film "Gorillas in the Mist", dedicated to Diane Fossey, took the world by storm.

The Kahuzi-Biéga National Park, which I have the pleasure of introducing to you in this booklet, is a true sanctuary for biodiversity. Numerous families of gorillas belonging to a unique sub-species live here. Visitors can observe this sub-species, *Gorilla gorilla graueri*, in their natural habitat only in Zaire. Today, four old silverbacks, Maheshe, Nindja, Mubalala and Mushamuka, have taken over from "Casimir", the famous silverback of the 1970's at the time when our late, and sadly missed, park warden Adrien DESCHRYVER was taking the first steps towards gorilla tourism in Zaire.

The Kahuzi and the Biéga, the two extinct volcanos that have given their names to the National Park, are symbols of the conservation of humid tropical mountain forests and of the species living there such as the forest elephant and the many strange primates. It is this collection of extraordinary natural beauty that has made this wonderful National Park a UNESCO World Heritage Site, and that lends itself so well to ecotourism activities.

In addition, the Kahuzi-Biéga is a unique example in the integration of conservation and development. With the much appreciated help of the German Technical Cooperation Agency (GTZ), the Institut Zairois pour la Conservation de la Nature (IZCN) has taken on the task of getting the local populations to participate in conservation activities and of applying, as far as they can, the fundamental principles of long-term development as formulated at the "Earth Summit" at the conference of the United Nations' Environment Programme in Rio in June 1992.

Take good care of the permits that you have purchased. They are the proof that you have contributed something, however little, to the noble task of nature conservation for the benefit of present and future generations.



President-Elect of the Institut Zairois pour la Conservation de la Nature, IUCN Regional Advisor for Africa, Vice-President of the IUCN Commission of National Parks and Protected Areas (CNPPA) for sub-saharan Africa.

MANKOTO ma MBAELELE

The Gorillas



3

The protection of the heavily poached gorillas was the prime reason for the institution of the KBNP in 1970.

Nowadays, a visit to gorillas who are habituated to humans certainly is one of the most exciting experiences of African wildlife. Observing a group of gorillas, everybody will appreciate the different expressions on the animals' faces and distinguish various personalities among these big primates.

There are 3 sub-species of gorillas: the western lowland gorilla, the mountain gorilla and the eastern lowland gorilla.

The western lowland gorilla, *Gorilla gorilla gorilla*, occurs in Congo-Brazzaville, the Central African Republic, Equatorial Guinea, Cameroon and Gabon. The Zaire and Sangha Rivers limit their distribution to the east. More than 20000 western lowland gorillas are still living there (1995).

The mountain gorilla, *Gorilla gorilla beringei*. The last survivors live in the volcanic regions of the Virungas in Zaire, Uganda and Rwanda as well as in the Bwindi Forest National Park in Uganda. In total of approximately 600 individuals survive.



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The eastern lowland gorilla, *Gorilla gorilla graueri*, only occurs in Zaire.

It is protected in the KBNP and in the Maiko National Park. It is distributed between Lubutu in the North, Lubero in the North-East and Fizi in the South. Of all the subspecies, *Gorilla gorilla graueri* is the most impressive. The males can reach a weight of 200 kg and a height of 180 cm when they stand upright. The females are distinctly smaller with a maximum weight of 110 kg and a height of 140 cm. The male is generally called a "silverback" after the saddle of short silvery hair on his lower back (photo 1, cover). Its face is more elongated and his nose with its compressed nostrils is narrower than in the

other sub-species. In 1982 it was estimated that there were still 3000 to 5000 lowland gorillas in Eastern Zaire.

A survey conducted in the mountainous part of the KBNP in 1979 counted 223 individuals, encompassing 14 families and 5 solitary males. A re-survey in 1990 has increased the population estimate to 258 - 284 gorillas in 25 groups plus 9 solitary males.

The gorillas live in families led by an adult male (photo 3); this is the "silverback" (photo 4 and 16).

In the mountain gorillas, families contain one or two additional adult males, who are usually related to the silverback. The size of a group varies between 6 and 37 members. A number of males



7



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(10% of the entire population) are solitary or form small groups of 4 members at most. From 15 years onward, the males are capable of founding a family. The females are mature at the age of seven and a half years, but the average age of first fertilization is closer to 10 years. Only one young is born (photo 7); the birth interval is 4 years. In the populations of the eastern lowland gorillas females are mature at the age of 8 years. This means that during her life time of 25 years a female can give birth only to 3 offspring. Compared to other animals, this is not a good reproductive success rate at all. The gorillas belong to those few species of socially living primates where not only the males but also the females emigrate from their natal group.

The group centres on an old male, the silverback, who leads and defends his family. He especially protects the two or three year old young (photo 2). These youngsters like to play and generally spend time in the neighbourhood of the silverback as their mothers no longer concern themselves with them (photo 5 and 6). The dominant silverback displays a great tolerance towards them. Each group of gorillas obeys a dominance hierarchy. Among the immatures, age is the critical factor; later on, it is size. In contrast, among the females the possession of an offspring is of primary importance.



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The gorillas prefer the forest to the vast open areas on the summits. They find their essential food stuffs in its dense understory. Whereas the western lowland gorillas prefer fruit (photo 10), those in the eastern lowlands feed mainly on leaves, roots, stems and pith of herbaceous plants (photo 11), lianas (photo 9), bamboo (photo 8 and 15) and parts of saplings. Gorillas living in the wild have never been observed to eat meat. The foodstuffs of the eastern lowland gorillas are distributed quite uniformly over their habitat. This is why they don't defend a special

territory but go on a daily amble of about 1 km under the leadership of the silverback. The search for food occupies almost half of the day. At noon they rest for one to two hours (photo 2 to 4).

In the course of a year one group needs an area of approximately 35 km². The territories of different groups sometimes overlap. If two groups meet, fights between the dominant males are almost inevitable. Occasionally, young females seize the opportunity to switch groups.

Some food species of the gorillas



10: Myrianthus holstii

A comparison of the gorilla population in 1978/9 and 1990 shows that the number of individuals has increased slightly as a consequence of great efforts made towards their protection. At the same time the average group size has gone down. Gorillas have actually become concentrated more in the mountainous part of the park. Transfers of females between different groups as well as to previously solitary males have become more frequent.



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Table: Main food plants of the gorillas

Plant life forms	Species	Part eaten	Geographical distribution and altitude	Forest type
Liana	Urera sp.	leaves bark	Kahuzi (1800-3000 m)	mountain forest
Grass species	Cyperus sp. Pennisetum purpureum	leaves pith		
Trees	Grewia coriacea	fruit	Itebero (600-1200 m)	rain forest of the plain
Herbaceous plants	Musanga cecropioides Pycnanthus angolensis	fruit, leaves fruit		
	Aframomum sp.	leaves pith		
	Ensete ventricosum Costus sp. Marantaceae	leaves pith leaves pith stems		



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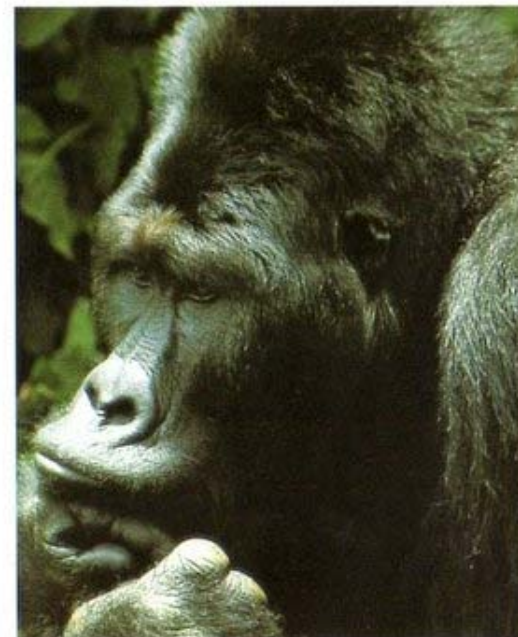
In the rainy season the gorillas restrict their ranging to the natural bamboo forests of the KBNP. The young bamboo growth constitutes their main food during this time of the year (photo 8).

In the tropical primary forest around Itebero, the pith of herbaceous plants of the Zingiberaceae, Marantaceae and Commelinaceae makes up an important percentage of their food. As many as 44 species are represented in their diet.



15

When they feed the animals are usually more spread out than when they rest or sleep. This is considered a definite sign of intra-specific feeding competition. Every evening, the gorillas build nests in which they spend the night (photo 12 and 13). These individual



16: Mushamuka



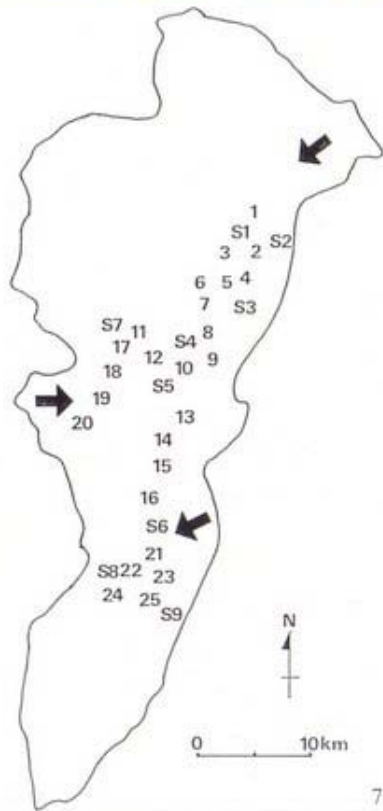
17: Maheshe's son

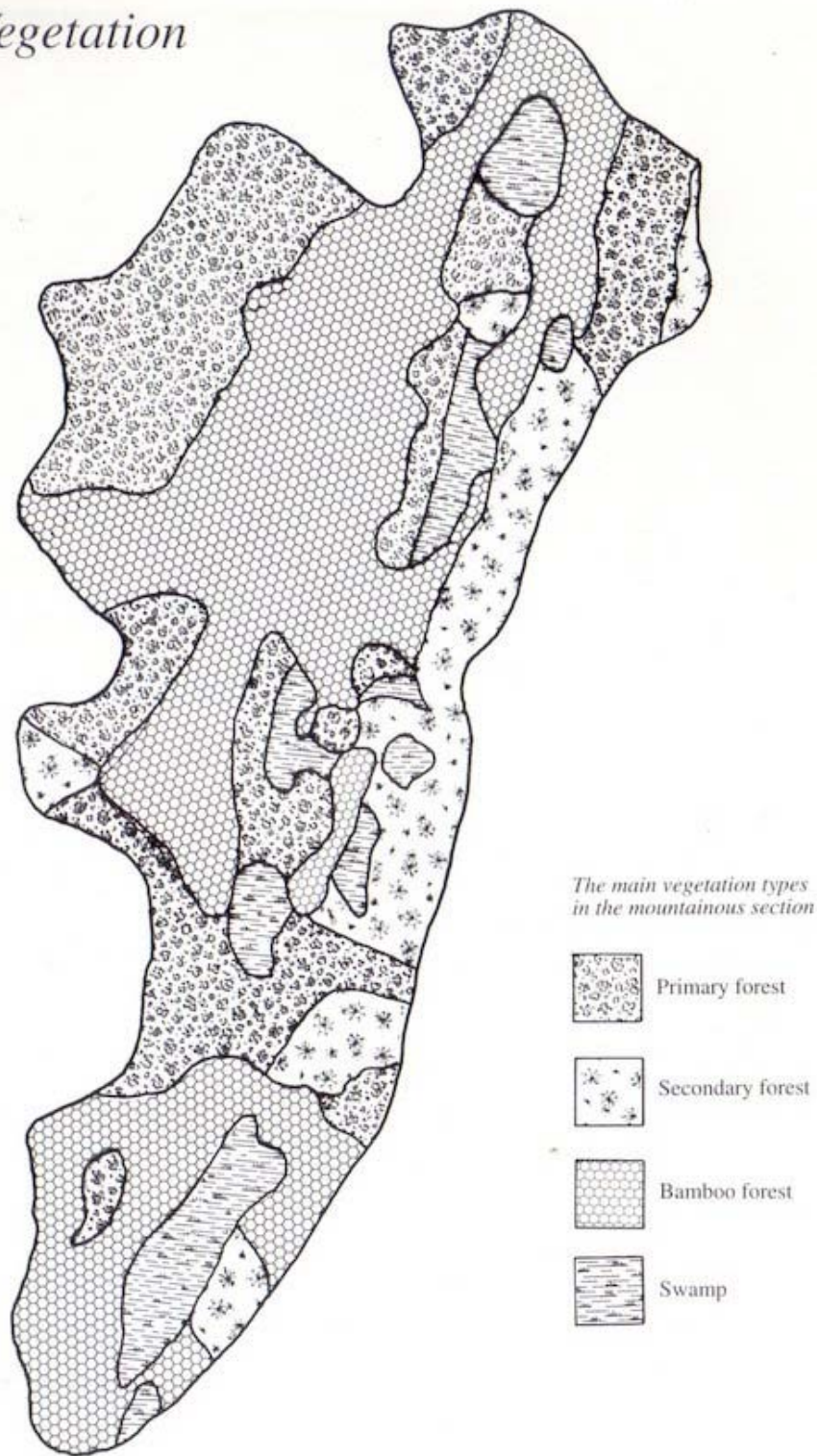
resting places allow for quite accurate estimates of the group composition. Most often they are built on the ground, spread out in such a way that most of the group members can see each other. The centre is reserved for the silverback, while young up to the age of 3 years stay in the vicinity of their mothers. Sometimes the gorillas sleep in the top of a dense bush. This depends on which type of vegetation is most common where they happen to spend the night. Sometimes they defecate into their nests.

In the KBNP four groups of gorillas are habituated to the presence of humans. Their leading silverbacks are well known. Their groups are named after them. The following table gives an overview of these four groups:

Silverback	Group size (in total)	Number of young individuals	Habituated to people since
Maheshe	16	11	1972
Mushamuka	19	10	1972
Mubalala	15	7	1986
Nindja (son of Mushamuka)	20	11	1989

The territories of 25 gorilla groups (1-25) and 8 solitary males (S1 - S8) during the 1990 survey.





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Most of the park is situated in the central basin of Zaire. Although it is called the "lower part", this actually consists of steep mountains cut by deep valleys whose altitude varies from 600 to 1200 m above sea level (**photo 32**). Here the prevailing vegetation type is the equatorial rain forest. It is a typical tropical rain forest: a great diversity of plant species is dominated by tall trees that branch only at the very top to form a dense, evergreen canopy 45 m above the ground. This canopy creates an atmosphere of half-shade and half-light that is barely sufficient for the growth of herbaceous plants and other understory species. These develop only at the forest edges and in clearings. Many species of big trees have buttress roots or, in more humid places, stilt roots. The humidity in the forest is always high. The ground is often soaking wet and its humus layer is very thin because the conditions of high temperature and humidity are ideal for decomposing organisms. A leaf can be "digested" within two months. In the mountainous part of the park (in the region of the mountains Kahuzi and Biéga) the succession of vegetation types from 900 to 3300 m has been well studied. Six different primary vegetation types are distinguished, each one accompanied by its typical secondary form.

Mountain rain forest and its secondary vegetation

The mountain rain forest stretches from an altitude of 900 to 2300 m. Its dominating species are *Albizia gummifera*, *Parinari excelsum* and *Chrysophyllum gorungosanum*. Between 900 and 1350 m the forest is "low altitude forest" with *Michelsonia* and *Gilbertiodendron*. Towards 1800 m, this is followed by the "low mountain forest" with *Pentadesma* and *Lebrunia*. This is a timber forest with sufficient light to allow growth of a layer of herbaceous plants. This type of forest is protected against fire as it cannot penetrate into it.

After humans have disturbed the equilibrium, this forest often becomes a shrub forest with a dense understory and many lianas. The best known secondary vegetation type is the *Hagenia* forest (**photo 18**). *Hagenia abyssinica*, *Neoboutonia macrocalyx* and *Croton macrostachys* tower over a herbaceous savanna consisting of *Hyparrhenia cymbaria*. This vegetation type is the result of minor interventions such as the cutting of undergrowth to make pastures for livestock.

The existence of herbaceous savannas at these altitudes is due to massive deforestation. All the places where light penetrates to the ground, such as all the clearings, are colonized by the ubiquitous fern *Pteridium aquilinum* which the livestock won't eat.

High altitude rain forest and its secondary vegetation

In general, the high altitude rain forest stretches from 1600 m to 2700 m. In the KBNP it is found above 2300 m and consists of the conifer *Podocarpus usambarensis*, *Syzygium guineense* and *Psychotria mahoni* (photo 19). Therefore this type of forest is termed "primary *Podocarpus* forest". It is characterized by a relatively lower height of trees and of the upper canopy. (Its vegetation is therefore less high than the vegetation of lower altitudes.)

Moreover, the height of the vegetation tends to decrease with increasing altitude. Most of the evergreen plants follow this rule. The shrub layer is well represented and epiphytes are abundant. With increasing altitude lichens become more frequent (*Usnea* is the most widely distributed species), with mosses, ferns and orchids. The remarkable tree ferns occur on lower slopes (photo 23). Lianas are rare or absent. In contrast to the soil in lowland equatorial forests, the soil contains a thick layer of litter and an even thicker layer of humus.

In the secondary forest created by the impact of humans *Myrianthus holstii* predominates ("secondary mountain Myrianthus forest") together with *Dombeya goetzenii*, *Macaranga*, *Sapium ellipticum* and *Neoboutonia macrocalyx*. The clearings and those zones that are completely deforested are invaded by lobelias (*Lobelia gibberoa*). At the end of the scale, fires and cattle grazing create prairies of *Imperata cylindrica* var. *africana*.



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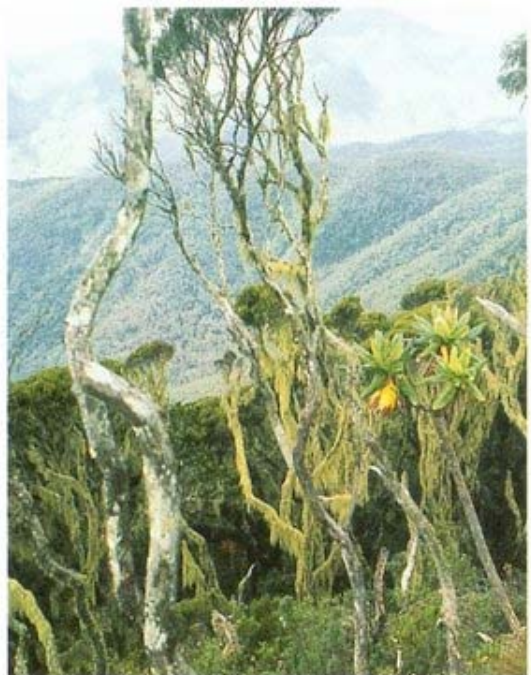
Swamp forest

This forest type develops in all places where the plants' reproductive cycles take place on soaking wet soils or where the soil has at least a layer of water on its surface during the dry season. There can be periodic or occasional floods. These conditions are not very favourable for the decomposition of organic material which therefore accumulates. Many species have developed stilt roots, others aerial roots (*Symphonia*). Light can filter through to favour the development of lower shrub layers. This vegetation is very difficult to penetrate. Dominant species in this type of forest are *Syzygium rowlandii*, *Podocarpus usambarensis*, *Agauria salicifolia*, *Anthocleista grandiflora* and some *Meteoricaceae*.

Bamboo forest and its secondary vegetation

The bamboo forest is practically monophytic: made up of *Arundinaria alpina* (photo 21). In the KBNP it is found between 2300 and 2600 m. Bamboo forest has a minimum annual requirement of 2000 mm precipitation. The bamboo stands between 6 and 15 m high and occasionally reaches even 20 m. Every 30 to 40 years, these plants flower collectively over large areas and then die. Clearing and cultivation of land enables the bamboo forest to spread over large areas.

Therefore the great stretches of bamboo forests seen today are the consequence of human activities. In the rainy season the young bamboo shoots constitute a favourite food for both the gorillas and the chimpanzees.



22



23

Subalpine heather

Above 2600 m trees can no longer grow: their growth is limited by ground temperature, which drops to approximately 7° C. This is the beginning of the heather zone with *Erica rugegensis* as the characteristic species (photo 27). *Erica* grows on the summit of Mt Biéga, along with *Vaccinium stanleyi* and *Breutelia*. *Hedythysus thamoideus* and *Disa erubescens* grow alongside *Erica* on the first summit of Mt Kahuzi (2800 to 3000 m). On Mt Kahuzi's main summit (3200 to 3300 m) *Erica* is joined by *Senecio kahuzicus* (photo 22) as well as *Helichrysum mildbraedii*, *Huperzia saurus*



24

and *Deschampsia flexuosa* in the highest parts.

This altitude is characterized by sclerophyllic (dry) vegetation. The ground is covered with a thick layer of turf, created by a blanket of different species of moss, among which is the true moss *Breutelia* (photo 26). The air almost always has 100% humidity. The sclerophyllic character of plants can be explained by their bad water retention: mosses with a very low (i.e. acid) pH "leak" water. The substrate is therefore "physiologically dry". The well known white petalled Everlasting (*Helichrysum*) also belongs to the Compositaceae of this zone (photo 25).



24: Kahuzi "hys"



25



26

List of endemic plant species in the KBNP and its surrounding area*

Dicranolepis incisa (Thymeleaceae)
Impatiens erecticornis * (Balsaminaceae)
Impatiens irangiensis * (Balsaminaceae)
Impatiens iteberoensis (Balsaminaceae)
Impatiens paucidentata * (Balsaminaceae)
Impatiens masisiensis * (Balsaminaceae)
Impatiens warburgiana * (Balsaminaceae)
Impatiens spec. nov. I * (Balsaminaceae)
Impatiens spec. nov. II * (Balsaminaceae)
Impatiens spec. nov. III * (Balsaminaceae)
Impatiens pierloti (Balsaminaceae) *
Impatiens gesnerioidea var. *superglabra*
 (Balsaminaceae)

Monanthotaxis spec. nov. (Annonaceae)
Peddiea kivuensis (Thymeleaceae)
Phyllobotryum lebruni * (Flacourtiaceae)
Polystachya kivuensis (Araliaceae)
Polystachya babyloni * (Orchidaceae)
Rinorea ebolowensis * (Violaceae)
Rinorea mildbreadii * (Violaceae)
Rinorea tshingondaensis (Violaceae)
Schefflera kivuensis (Araliaceae)
Selaginella auquieri * (Selaginellaceae)
Senecio johnstoni ssp. *kahuzicus* (Compositae)
Swertia macrosepala * (Gentianaceae)



30: Small river in the "low part"



28

Swamp and peat bog

Swamp biotopes can be found at different altitudes but not above 2400 m. They occur less frequently at high altitudes however, because of the steepness of slopes. The "Cyperus swamps" (*Cyperus latifolius*) are the dominant vegetation (photo 28 and 29). In addition, *Hypericum lanceolatum* or *Cyperus aterrimus*, *Alchemilla cryptantha*, *Anagallis angustiloba* or *Jussiaea repens* are represented. Peat bogs are created by a symbiosis between *Juncus effusus* and *Sphagnum rugegense*. In the rainy season, the gorillas regularly visit the *Cyperus* swamps where they eat pith and fresh leaves.

All the above mentioned plant formations have to be protected especially since they have become much restricted in area in the neighbouring countries (Rwanda, Burundi and Uganda). The KBNP boasts several endemic species in almost every phytosociological association. They are listed as follows.



The Primates

Scientific name	English name	Itebero	Kahuzi
<i>Galago demidovii</i> (1)	Dwarf galago	×	×
<i>Perodictus potto</i> (1)	Bosman's Potto	×	?
<i>Cercopithecus ascanius</i>	Red-tailed guenon	×	
<i>Cercopithecus hamlyni</i>	Owl-faced guenon	×	×
<i>Cercopithecus mitis</i>	Blue guenon	×	×
<i>Cercopithecus mona</i>	Mona guenon	×	
<i>Cercopithecus lhoesti</i> (2)	L'Hoest's guenon	×	
<i>Cercocebus albigena</i>	Grey-cheeked mangabey	×	
<i>Colobus angolensis</i> (3)	Angolan black-and-white colobus		×
<i>Colobus abyssinicus</i>	Northern black Colobus		×
<i>Colobus badius foai</i>	Western red colobus	×	×
<i>Papio anubis</i> (4)	Anubis baboon	×	×
<i>Pan troglodytes</i> (5)	Chimpanzee	×	×
<i>Gorilla gorilla</i> (6)	Gorilla	×	×

There are 13 species of primates in the KBNP. The above table shows where they occur. Note that Itebero is situated in the low part of the park and Kahuzi in the mountainous section.

(1) These two species of the Loris family belong to the prosimians and are nocturnal.

(2) To date, this species has only been observed in the surroundings of the KBNP but it is expected to occur there too. It is very sensitive to habitat disturbance. It has therefore become rare in East Zaire and neighbouring countries. It is one of the species that are especially threatened.

(3) Some authors maintain that there are two distinct species *Colobus angolensis* and *Colobus abyssinicus*, rather than two sub-species.

(4) This species is also considered to be a subspecies of *Papio cynocephalus* (*P. c. anubis*).

(5) The subspecies *Pan troglodytes schweinfurthii* is found in the KBNP.

(6) The subspecies *Gorilla gorilla graueri* is found in the KBNP.

The protection of the primates in the mountainous part of the Kahuzi-Biéga is relatively assured. In contrast, the populations of the "low part" and the neighbouring zones are severely threatened by poaching in spite of the creation of the park. Monkey meat is a favourite in the meat markets.

Tropical forest monkeys generally form groups that consist of several species. In the bamboo forest of the Kahuzi, these multispecific troops are made up of *Cercopithecus mitis* and *C. ascanius* (photo 37) or *C. ascanius* and *Colobus badius*.

Multispecific troops have many advantages. The smaller species' search for food is facilitated as they

can exploit remnants left by bigger species, especially in the case of fruit that only the big species can open. Bigger species take advantage of the smallest species' better knowledge of the habitat. Finally, a mixed troop can detect predators like eagles, chimpanzees, leopards and golden cats more easily.



34: Chimpanzee nests



Dwarf Galago



Bosman's Potto



Red-tailed Guenon



Blue Guenon



Mona Guenon



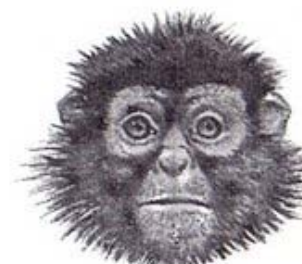
Owl-faced Guenon



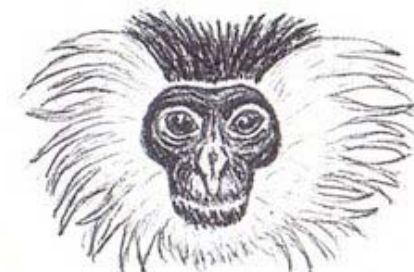
L'Hoest's Guenon



Grey-cheeked Mangabey

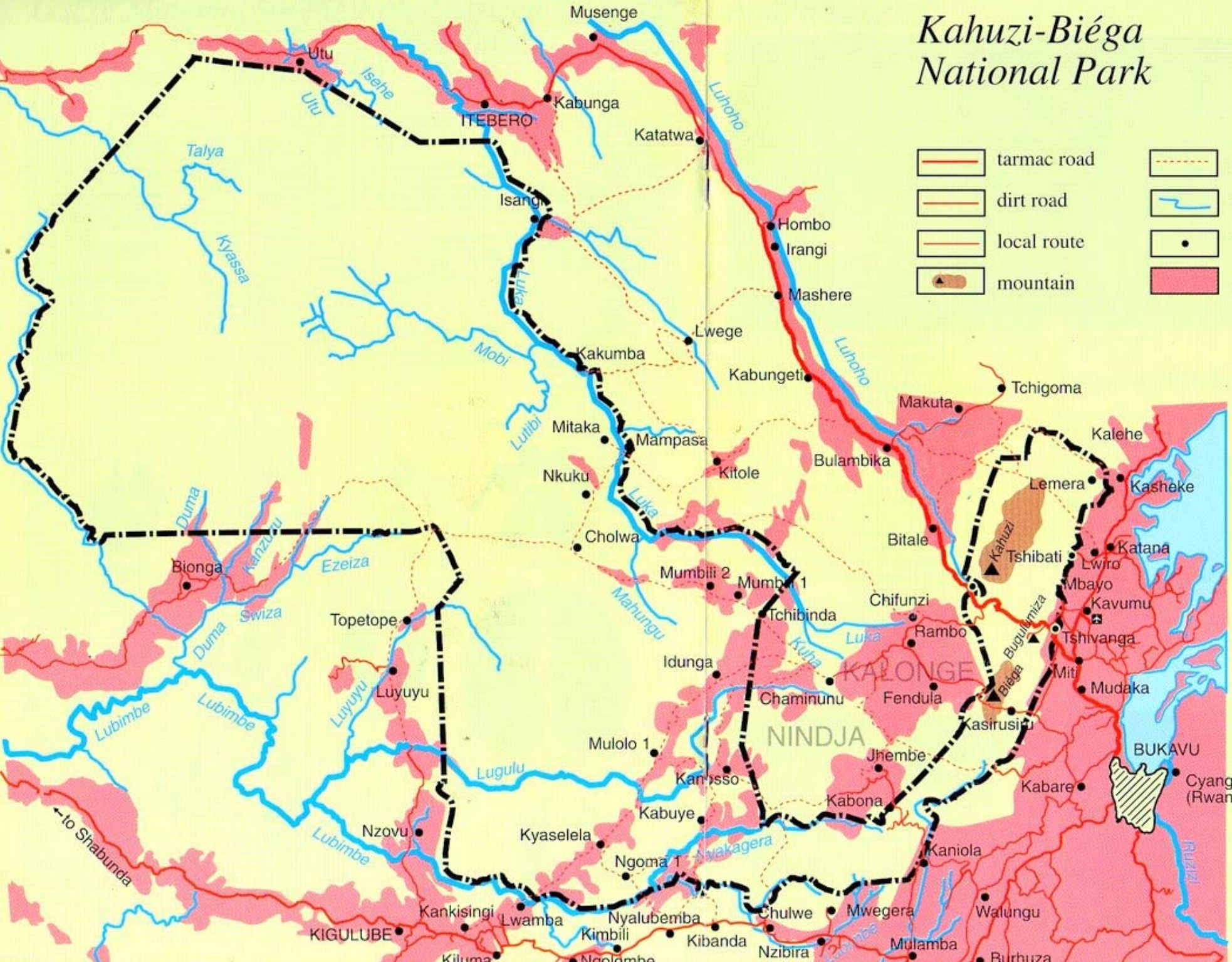


Red Colobus



Angolan Black-and-White Colobus

Kahuzi-Biéga National Park



- tarmac road
- dirt road
- local route
- mountain
- path
- river
- village
- agricultural area

0 10 20 km

The Conservation of the Forests



77

During the last decades, almost half of the world's tropical moist forests have been destroyed and transformed into plantations or scrubland or left fallow (photo 78). Each year, some 100,000 to 150,000 km² of virgin forest are lost, corresponding to more than 300 km² per day. This is resulting in a massive extinction of species, since these forests form the natural environment for an extremely rich biodiversity.

It has been estimated that more than 80% of the world's known species live in the tropics. Considering just the insects, which number close to 30 million species, more than half are found in the tropical moist forests although these cover only 6% of the land surface. Although it is in Africa that the disappearance of forest has been the most serious, Zaire remains the country in which their preservation has been the most effective.



78



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The species diversity of tropical moist forest contains quantities of precious resources hitherto unknown. The forest protects against soil erosion, retains water, maintains the local climate and even contributes to global climatic stability.

At present shifting cultivation and forest clearance by burning are the major threats to the forest (photo 77). To date, reforestation with local species has been impossible; natural regeneration would take at least five centuries. This being the case, we must try to preserve what remains of the original forests.

A form of forest exploitation that does not take into account the ecological balance is not defensible. Exploitation is only supportable where profit can be made from a surplus while safeguarding the forest resource. The alteration of intact ecosystems by thoughtless cutting and accidental fires disrupts the food web which forms the basis of the ecological balance. Subsequent alterations in trophic structure can have unpredictable consequences.

Within a forest soil, available organic resources are sufficient to obtain a satisfactory yield over the years. However, tropical moist soils lacking a sufficiently dense vegetation cover rapidly develop soil exhaustion. Strong rainfall alternating with intense insolation leaches and cracks the soil. The absence of symbiotic mycorrhizae lowers the capacity to accumulate nutrients necessary for indigenous plants. The abrupt impoverishment of the upper strata causes a rapid fall in the agricultural yield and builds up nutritional problems for the local populations.

A national park must serve to protect and conserve all species and all resources found within it. Possibilities for the study of vegetation and animal production, growth and interspecific relations within a protected area are highly beneficial. Notably, this creates prospects for developing efficient long-term systems for utilizing the forests adjacent to the park and in comparable natural environments. Non-damaging systems would consist of fruit picking, production of natural biocides, collection of substances of potential value as phytomedicines, and the exploitation of other primary substances. Encouraging a return to the culture of plants more adapted to the environment, effective hunting controls (offtake of 10-20% of the animal population) and a seasonal and partial collection of terrestrial snails (*Achatina*) as an additional source of meat are essential complementary measures.

Initially, hunting served only to provide game meat for the village communities. It was based on traditional capture methods and was regulated by ancient tribal laws. Even recently, this did not represent a threat to game animals. However, an upsurge in poaching has occurred, demonstrated by increased occurrence of snares and nooses. Loss of a hand or foot by young gorillas is more and more frequent (photo 81). It is generally the stronger silverbacks who manage to free them from the tightened snares, but sometimes at the price of serious wounds or even a severed limb.

The Kivu region is rich in minerals: it has been the location of intensive prospecting for natural resources, such as gold. The KBNP has not been spared this activity (photo 79). If the search for gold deposits



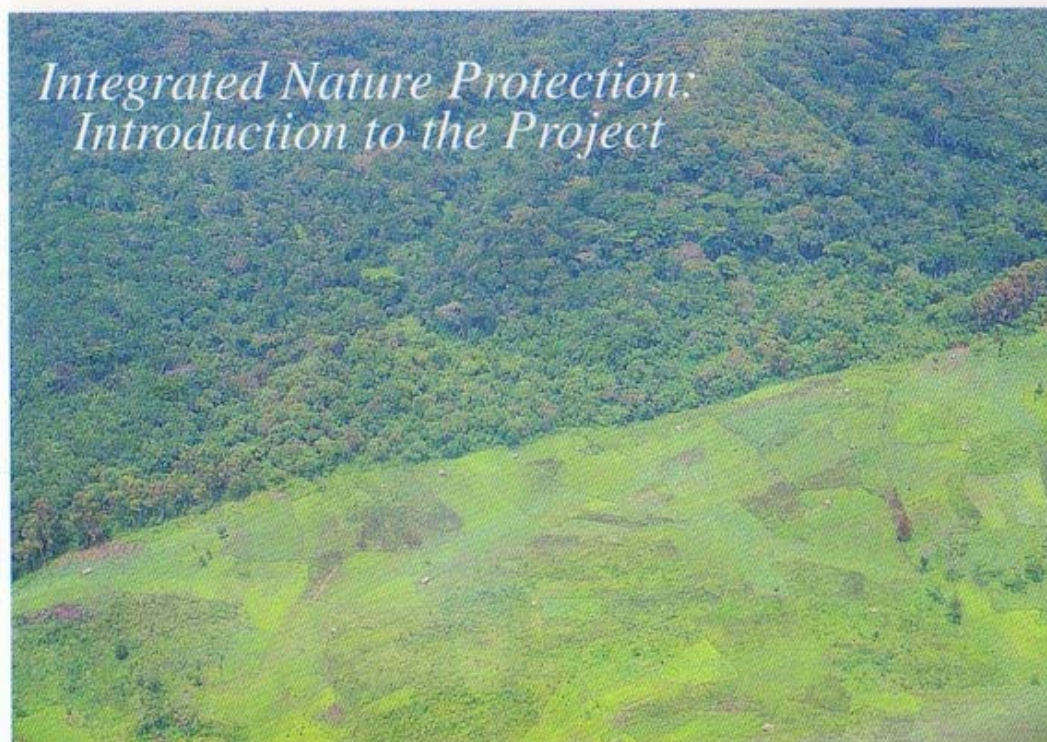
80: Children offer Goliath beetles for sale



81

intensifies, secondary impacts on the park will become intolerable. Prospecting leads to the creation of villages and, consequently, an expansion of poaching.

The KBNP is made up of two parts. The new extension, instituted in 1975, is linked to the older mountainous section by a narrow corridor. The corridor is vulnerable by definition, and it is precisely there that the most serious human disturbance is found. This has the consequence of preventing the mixing of elephant and gorilla populations in the older part of the Kahuzi-Biéga with their conspecifics in the lower part, increasing the probability of inbreeding. This exchange of genes must be facilitated. Appropriate protection and management is required, which will also benefit all other species.



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In 1975, the park was extended from 600 to 6000 km² by the addition of virgin forest located at lower altitudes to the former mountainous section. This included populated areas within the park without the populations concerned having been consulted. Faced with a loss of livelihood without compensation the population flatly rejected the park.

It must be realised that the park is situated in one of the most populated regions of Zaire, which can attain a density of 300 persons per km². This concentration of people has led to a rapid loss of forest cover, over-exploitation of soils consistent with a form of agriculture which is poorly adapted to the region and partial land erosion (photo 82).

The population pressure on the natural resources of the park is therefore very high, which leads to cultivation, creation of pastures for cattle (photo 78), collection of fuelwood (photo 85) and game animals, etc. Even today the newly created areas of the park represent a zone of colonization in that large parts of the virgin forest are being converted for agriculture (photo 84). At present it is estimated that more than 9000 ethnic Bashi, Batembo and Barega are living in the park.

At the request of the Government of Zaire, the Federal Republic of Germany has supported a pilot project in the KBNP area since July 1985. This has the aim of reducing the pressure on the park's resources by development around its periphery. In this respect, activities have been carried out which show immediate effects, designed to gain the confidence of the local

Integrated Nature Protection: Introduction to the Project

people. The population is being helped through the building of dispensaries and schools, and improving both conditions of hygiene and women's workloads by projects providing piped water from natural sources. In the long-term, it is a question of successfully developing an agriculture adapted to the region thereby increasing the wealth of the population neighbouring the park.

The Zairean Institute for Nature Conservation (IZCN) wishes to develop a national strategy for nature conservation, which combines the protection of nature with the needs of the rural population. The German Technical Cooperation Agency (GTZ) is participating here in organizing training courses for staff and guard. It is also contributing towards the provision of necessary logistical equipment (communication equipment, vehicles) and fieldwork supplies (clothing, camping materials). The project also hopes to reconcile the requirements of tourism with those of the Zairean authorities and to increase the means towards scientific research in the KBNP.

A form of tourism other than mass tourism will be developed, keeping disturbance of the gorilla to a minimum. Merely through their existence, the activities will certainly increase surveillance of the gorillas and thus contribute to their protection. On the other hand, the foreign currency which is generated and which IZCN needs urgently, is also invested in the development of the regions peripheral to the park.



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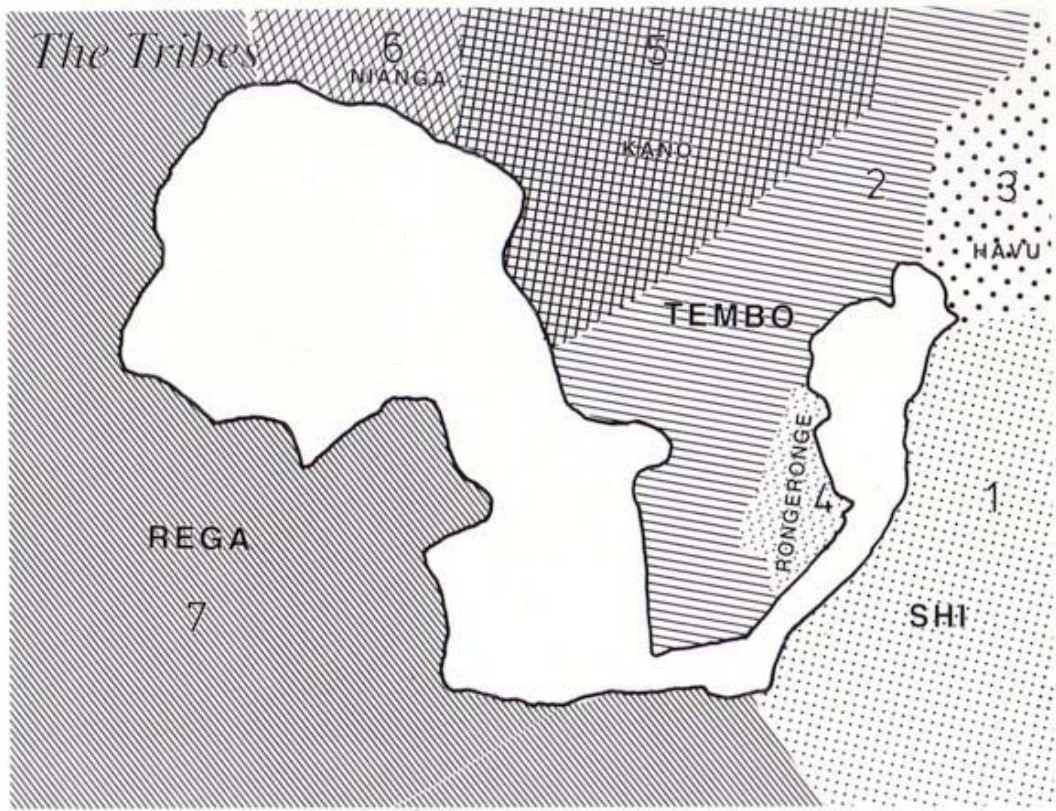
Rational utilization of the park must have a scientific base. Key information is already available, on distribution of vegetation types, the habitat of large mammals and the ecology of many parts of the park. Important species such as elephants and gorillas have been censused and their distribution is known, which will allow long-term planning and the detection of changes. Ecological research is supplemented by applied studies to determine an appropriate agricultural system and by sociological surveys in the regions bordering the park.

However, projects involving the repairing and widening of the main road between Bukavu and Kisangani would create a real danger for animal species in the older part of the park, most of all for the gorillas

(photo 83). An increase in traffic would heighten the risks of separating the two populations. From the moment of separation, the gorillas will be doomed to disappear through a gradual degeneration in fitness caused by repeated inbreeding. Indeed, among the gorillas only certain males are involved in breeding: the danger of inbreeding is therefore greater where population size is reduced. Other risks inherent in increased traffic are, notably, uncontrolled gorilla tourism, an upsurge in poaching, more frequent road accidents that may seriously harm the environment (for example, accidents involving loaded petrol tankers) or bushfires caused by carelessness among people overnighing in the park after their cars have broken down.



84



Between 1970 and 1984, the growth rate of the population of Kivu was 3.1% per year, corresponding to a rise in population density from 13 to 20 inhabitants per km². 90% of the population is rural, of whom most are dependent on agriculture. With more than 250 tribal groups, Zaire contains an extraordinary diversity of peoples, and Kivu is one of the regions with the greatest diversity.

In the environs of the KBNP no less than seven separate tribes are found. The park is principally concerned with the Bashi, Barega and Pygmies.

The Pygmies

Forced to leave the older part of the park where they had always lived, they now live in small villages located close to the forest on land claimed by the Bashi. They have not given up hunting and setting of snares to trap small mammals, traps that are also dangerous for young gorillas. They live in extended families and occasionally establish peasant farms. In this, they apply the same farming techniques as the Bashi. However, this activity is below the level of subsistence and they supplement it by selling or bartering cannabis, wood and game meat. To divert their interests from the park's

resources, IZCN has found employment for them: some have become trackers for visiting gorillas, others are employed in the construction and repair of the trails in the park.

The Rega

(also called Lega or Barega)

The Rega, the dominant tribe in the western part of the KBNP, are forest agriculturalists. They practice a subsistence economy of shifting cultivation and hunting. Their cash supply, obtained by searching for gold and cassiterite (tin ore), varies considerably. The "Bwami", a person who is highly placed and very involved in a religious secret society, totally controls the social behaviour, hunting included.

The entire forest including animals belongs to him. Anyone wishing to hunt must obtain that right from him, and pay a fee. According to the Bwami, land rights are held by the political chief and administrator of the village. However, scarcely more than six people live per km² in the Barega lands and so a land right is easily purchased. The majority of villages in the park are Rega (Nkolo and Mbili trails).



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The Bashi
 (also called Shi)

not exclude a measure of allegiance or dependence of the acquirer on the "seller".

Almost the entire banana crop is used to make beer, the main commercial product. Banana beer plays a major role in the whole range of social relationships (dowries, parties, pacts, etc), which makes the banana a greatly valued product: "Anyone who regularly picks bananas wants for nothing" is a saying of the Bashi.

The central and most original component of the local agricultural system is banana cultivation. The requirements of land for banana plantations correlates to the rapid growth of the human population.

Similar to the Rega, the Bashi's political organization revolves around a "Mwami" who is accorded, in principal, absolute power. This power relies on some main chiefs who are directly subordinate to him and the recipients of much largesse (power, land, cattle). This small group of highly placed chiefs rely in turn on a series of sub-chiefs; the same system of gifts is applied, but on a smaller scale.

Their area is divided into several chiefdoms. Land division actually takes three forms:

- 1) Bwasa: Short-term land lease. The rent is calculated as a proportion of the realized profit and consequently is settled in arrears.
- 2) Kalinzi: The "Mwami" acts as the landowner and sells the land. From then on the buyer cannot be evicted.
- 3) Bugule: This form has developed from Kalinzi. The concept of ownership here is, however, rather different to that under European land tenure systems. In effect, Bugule does



86 Local transport

Information for Visitors



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time while causing minimal disturbance to the gorillas.

Your vehicle is used to approach as close to the gorilla sites as possible; the remainder is on foot through often difficult terrain. Accompanied by a guide and four trackers, you go first to the area occupied by the gorillas the previous day. You subsequently follow their tracks to their overnight nests, and from there go on until you make contact with the gorilla family and their silverback.

Currently, four groups are habituated to visitors. These are the "Maheshe", "Mushamuka" and "Nindja" groups (each of about 20 individuals) and the "Mubalala" group (about 10 individuals).

Visiting the Gorillas

To visit the gorillas it is strongly recommended to reserve your place in advance, especially during the tourist season (summer, Christmas and Easter holidays).

Reservations can be made either at the Regional Office of IZCN at 185, Av. President Mobutu in Bukavu (open from 0800-1500 Mondays to Fridays and 0800-1200 Saturdays) or at Tshivanga at the entrance to the KBNP (open every day from 0800-1200). Written requests must be addressed to IZCN, Kahuzi-Biéga National Park or to the Regional Coordination Office, Post Box 852, Bukavu, Republic of Zaire. Should the occasion arise, you can register through your tour agency and, in the near future, by using Zairean agencies such as AMIZA.

At Tshivanga, the entrance to the park, you must check in and pay for your visitor's permit. Children of less than 15 years of age are not admitted. You are advised to bring a raincoat, boots or walking shoes, gloves, water and, if required, a picnic lunch. The walk into the forest may last from a few minutes to several hours. Visitors are limited to groups of eight persons per gorilla group per day (photo 87). Restriction of numbers permits maximum visiting



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Visitors must obey the instructions of the guide (**photo 88**) and pay particular attention to the following rules:

- Always stay in a group behind your accompanying staff;
- Do not under any circumstances retreat if approached closely by the dominant male; even if the male charges, stay still and follow the instructions of the guide;
- Never touch a young gorilla that approaches you as this may precipitate a dangerous encounter with the dominant male;
- Avoid all abrupt gestures and do not make excessive noise;
- Do not eat or smoke while with the gorillas; while in close proximity to humans the gorillas are susceptible to human diseases;
- Under no circumstances leave rubbish behind in the forest (cigarette butts, food, bottles, etc); the gorillas may pick it up and eat it, thus running the risk of contracting human diseases.



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Picnic on Mount Bugulumiza

Walking Trails

For the less intrepid walker, Mount Bugulumiza represents an excellent alternative. A trail about 6 km long goes through the forest and leads straight to the summit. It is ideal for a walk but can also be taken by an all-terrain vehicle. From the summit, you can enjoy a fine view of Lake Kivu, the Kahuzi and Biéga peaks, and, in good weather, the active and extinct volcanos close to the town of Goma.

The Mbayo Trail

Close to the entrance of the park, this trail leads to the large Mbayo tea plantation. From there, another trail crosses the Hagenia forest, passes the tree ferns, and arrives at a picnic and camping site on the banks of the Musisi River.

Starting from the camp at Tshivanga, different routes offer good possibilities of observing birds and monkeys. A walk of 30 minutes from close to the Centre of Research in Natural Sciences (CRSN) at Lwiro will take you to the Tshibati waterfalls and you can also visit a pygmy village.

Other Attractions of the KBNP

Climbing Mount Kahuzi

At 3,308 m, this is the highest peak in the park. From Tshivanga you drive for 20 minutes to the Kahuzi patrol post, the second entrance to the park and the point of departure for this trip. The climb takes about 4 hours. In the course of the climb, you cross an attractive bamboo forest before entering a dry vegetation of heather, senecios and lobelias. At the summit, a splendid view of Lake Kivu and the town of Bukavu awaits. You should provide yourself with shoes giving a good grip, a raincoat, and a picnic.

Climbing Mount Biéga

Reaching an altitude of 2,790 m, this is the second highest peak in the park (**photo 89** and **92**). The vegetation is completely different to that of Mount Kahuzi; you walk through an impressive formation of giant heather, reaching more than 2 metres in height. The climb takes about 2 hours. To get there, leave the main Miti-Tshivanga road 4 km after Miti and take the Kadjedje-Kalonge road.



90: Crossing the River Luga near to Ihebero

Getting to the Park

Getting there by Car

- Kigali-Butare-Cyangugu: the journey takes about five and a half hours.
- Bukavu-Tshivanga: 31 km along a winding tarmac road.
- From Bujumbura, you can go via Cyangugu, travelling through Rwanda on tarmac roads (the journey takes about two and a half hours).
- From Bujumbura you can also go straight to Bukavu by going up the Nyangesi escarpment; you should allow four to five hours for this. From the escarpment there is a spectacular view over the Ruzizi valley, but the track is steep.
- From Goma, you can go to Bukavu by taking the road along Lake Kivu: these 200 km will take about six hours, depending on the state of the road.

Getting there by Air From Europe:

- By SABENA, which departs from Brussels to Kigali and Bujumbura (several flights each week).
- By AIR FRANCE, which departs from Paris to Kigali and Bujumbura (several flights each week).
- By ETHIOPIAN AIRLINES via Addis Abeba.
- By LUFTHANSA and SWISSAIR to Nairobi, and onward by KENYA AIRWAYS.

- By AEROFLOT: inquire at your travel agency.

Important Note: Although many international flights stop at Kinshasa, the capital of Zaire, the KBNP is much more easily accessed through Bujumbura or Kigali.

African domestic flights:

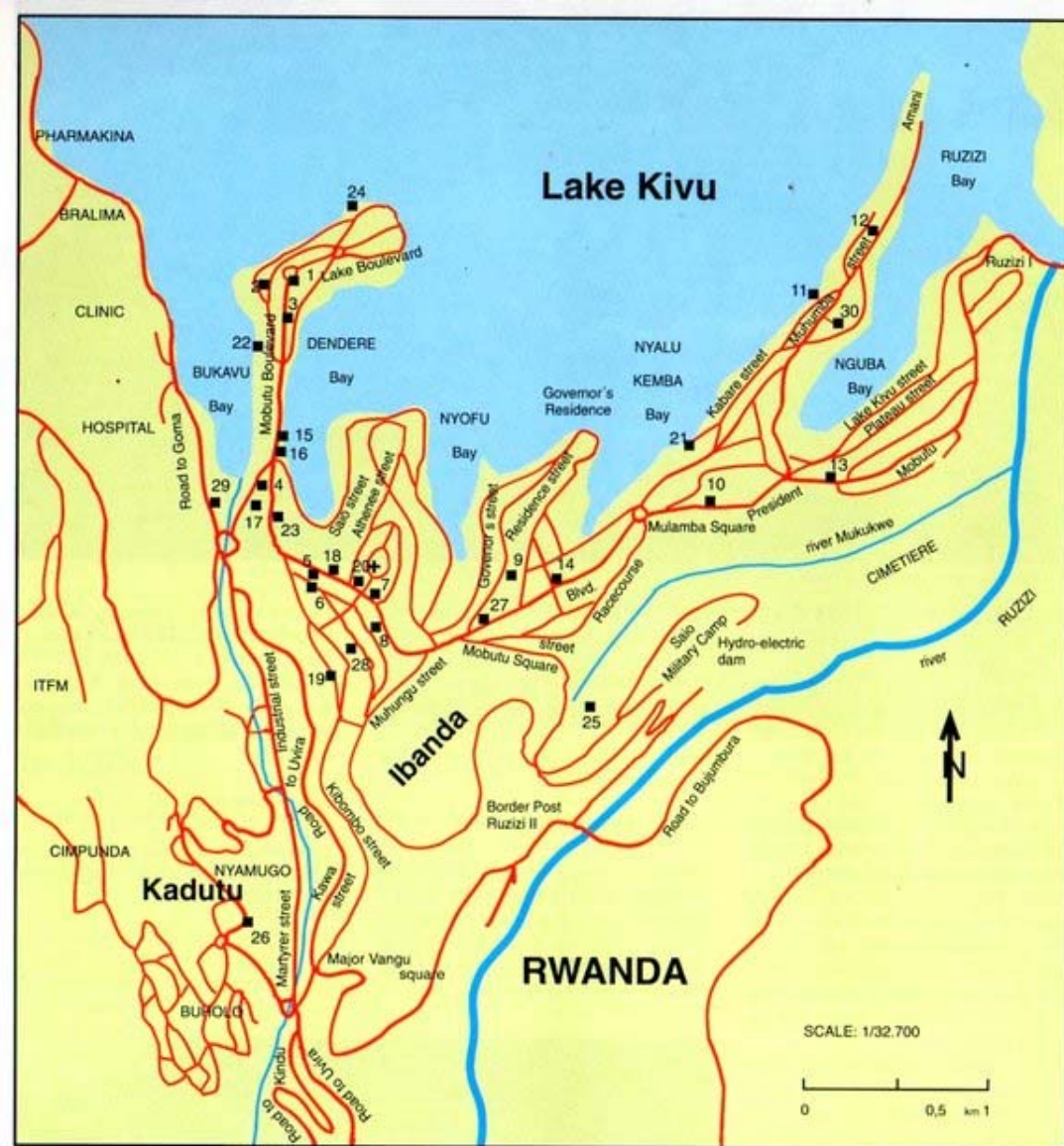
- From Kinshasa to Goma by AIR ZAIRE (several flights per week). From Goma to Kavumu (30 km from Bukavu) by local airlines such as VAC, TMK, AGETRAF and SWALA (several flights per day).

- From Kinshasa to Goma by SCIBE, SHABAIR and CITYEXPRESS.
- From Nairobi to Kigali by KENYA AIRWAYS, then from Kigali to Kamembe (the airport of Cyangugu) by AIR RWANDA. Possibilities most days.

Getting there by Boat

From Goma to Bukavu on Lake Kivu (2-3 departures per week). The journey takes 5 hours.





Map of Bukavu

- | | | |
|-------------------------------------|-----------------------------|--------------------------------|
| 1. Local Government House | 11. German Consulate | 21. Orchid's Safari Club Hotel |
| 2. Police Station | 12. French Consulate | 22. Riviera Hotel |
| 3. Culture, Arts and Tourism Office | 13. Belgian School | 23. Residence Hotel |
| 4. AMIZA | 14. OFIDA | 24. Sports Club |
| 5. French Cultural Centre | 15. Air Zaire Office | 25. Riding Club |
| 6. AGETRAF | 16. Zairean Commercial Bank | 26. President Mobutu Stadium |
| 7. SONAS | 17. United Bank of Zaire | 27. IZCN |
| 8. Burundi Consulate | 18. Peoples Bank | 28. OZRT-ONPTZ |
| 9. Immigration | 19. Bank of Zaire | 29. SNCZ +Cathedral |
| 10. Alfajiri Institute | 20. City Hall | 30. Auberge Chez Kris |

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