



Extract from No. 13
December 1996

Gorilla Journal

In the Forest of the World's Rarest Gorillas

A remote mountain in eastern Zaire, Mt. Tshiaberimu, is the home of the smallest gorilla population of the world. It still is not known what they look like and whether they are mountain gorillas, eastern lowland gorillas or another subspecies.

After an adventurous and sometimes dangerous journey, Ulrich Karlowski, Ursula Karlowski and Denise Wenger, on behalf of the *Berggorilla & Regenwald Direkthilfe*, succeeded in working their way through to Mt. Tshiaberimu in July 1996. They handed over urgently needed equipment to the guards. This was the start of our new gorilla conservation project.

In a Precarious Situation

At the beginning of the century, the rain forest surrounding the 3,100 m high Mt. Tshiaberimu was estimated to extend to 450 km² – now only about 60 km² are left. The mountain is situated in the northern sector of the Virunga National Park (see map on page 8), but the forest corridor which formerly connected it to the main park area down to Lake Edward (912 m), has been cleared and settled. In 1959, George Schaller was the first to undertake a longer expedition to Mt. Tshiaberimu and stayed 2 weeks there, in the extreme north of the rift valley gorilla distribution area. Already at that time, the rain forest had been cut down and cultivated to a large extent. From time to time, gorillas were poached for their meat. Schaller still found traces of four groups with a total of 20 individuals and estimated that their total number was no more than 40.

In 1986, 27 years later, another zoologist surveyed the region, although very briefly. After his visit, Conrad Aveling assumed that the number of gorillas had decreased to about 20. Finally, in 1995 Thomas Butynski and Esteban Sarmiento conducted the first true gorilla census at Tshiaberimu. This survey was funded by *Zoo Atlanta* and *Berggorilla & Regenwald Direkthilfe*. During their 2-week census, the American researchers, who were assisted by Zairean and Ugandan experts, found traces of one gorilla group with four members and another one with eleven individuals, as well as a solitary silverback.

It seems that the total number of gorillas remaining on Mt. Tshiaberimu is 16 to 18, at best perhaps 20, certainly not more. We searched nearly every corner where gorillas might be found. Surprisingly, the animals only use an area of approximately 18 km² in the bamboo and large Podocarpus zone between 2,700 and 2,900 m on the southwestern corner of the mountain,

Esteban Sarmiento said. The anatomist had measured gorilla skeletons and skulls, including a few from Mt. Tshiaberimu, in museums around the world. When we asked whether the animals belong to the mountain gorilla subspecies, he said:

We can only say that they are unusually large gorillas which cannot simply be classified as mountain or eastern lowland gorillas. Without additional field observations, we just can say for the moment that this certainly is a very interesting genetic variation of the species.

At least these animals have learned to hide very well – neither the researchers nor the park guards saw any gorillas, not even from a distance.

Forest Elephants, Monkeys and Rare Birds

During the 1995 expedition, forest elephants also were hiding in the dense forest, although their tracks were clearly visible throughout the forest area between 2,600 and 3,100 m. The guards said that there were about 30 individuals including a newborn infant. Other larger mammals have become scarce at Mt. Tshiaberimu; only blue monkeys (*Cercopithecus mitis*) live there in considerable numbers. A L'Hoest's monkey group (*Cercopithecus lhoesti*) and some guerezas (*Colobus guereza*) were sighted, and the guards said that probably three duiker species are also present, whereas leopards, forest hogs and buffaloes have vanished long ago. Elephants, gorillas and the other animals are prisoners of the mountain; they cannot escape because the areas between the forest islands are too densely populated.

Numerous bird species live in this rain forest that looks strangely lost. Even if not all species have been registered, it has become clear that the Tshiaberimu hosts a surprising variety of birds, amongst them several rare species that perhaps can only survive as long as this forest exists.

A Forest Refuge and Many Questions

Wherever you look from the top of Mt. Tshiaberimu, the forest has disappeared outside the park boundaries except for small fringes along the mountains. Even those last remnants are slowly being destroyed bit by bit. Only a very small area is remaining from a rain forest that was still large 100 years ago.

Contrary to George Schaller's observations, during the last years not poaching, but slash-and-burn cultivation was the most serious threat to the gorillas and elephants. Some parts of the forest have been cleared and are populated up to 1 km within the national park area. Along the rivers the disastrous traces of gold miners who worked there until a few years ago are still clearly visible.

Is there a chance of survival for 20 gorillas in a 60 km² forest island in politically instable eastern Zaire at all? Does it make sense to protect a population of 20 animals without any chance for contact with conspecifics, who therefore inevitably end up in a genetical dead end? Would it not be a better idea to catch the gorillas of Mt. Tshiaberimu and translocate them to a zoo or larger national park area? Would this promise a better chance to save them from extinction? "Anyone who considers this or similar actions is wasting time, and the Tshiaberimu gorillas do not have much time left". This is the conviction of Kimpungi-Muckar, the conservator of the northern sector of Virunga National Park.

With nearly fierce determination, the IZCN (*Institut Zairois pour la Conservation de la Nature* – Zairean Institute for the Conservation of Nature) wants to save as many of the animals and as much of their habitat as possible. Since the conservator increased the number of guards for Tshiaberimu, poachers are hardly seen any more, and gold miners and woodcutters have completely disappeared from the area. Illegal cultivation has also been brought to a standstill. Staying in the forest can be dangerous for poachers nowadays. With no questions asked, armed intruders may be shot, and anyone who carries arms should be aware that the guards will shoot if he runs away instead of surrendering.

However, the guards do not have much more than their guns to protect the area. Their monthly pay is about \$ 1 and they do not receive it regularly. Thanks to an EU project which adds another \$ 15 to their monthly earnings, the IZCN guards now have enough time besides agriculture to dedicate to nature conservation.

But even the \$ 15 to 16 per month are neither sufficient for food, nor for clothing or equipment. There is no hope for help from Kinshasa, and until recently it seemed as if the world had forgotten about the gorillas of Mt. Tshiaberimu and their guards. Tom Butynski and Esteban Sarmiento recommended that a comprehensive nature conservation project be established as soon as possible. As an immediate first step, equipment should be provided for the twelve Tshiaberimu guards. This was what we wanted to do during a scientific expedition.

Uncertain Journey into the Dark Heart of Africa

For July 1996, a 2-week expedition to Mt. Tshiaberimu had been planned with representatives of the *Dian Fossey Gorilla Fund* (DFGF), *Zoo Atlanta*, the American Museum of Natural History in New York and the *Berggorilla & Regenwald Direkthilfe*. Its most important aims were to negotiate with leading officials of the IZCN possibilities for the immediate establishment of a conservation project there, to conduct comprehensive zoological and botanical inventories and to provide equipment to the guards. Altogether, about 14 persons from the USA and Germany were to participate. In addition to the equipment, we had already ordered new uniforms and gum boots from a manufacturer in Kinshasa. According to our schedule, the uniforms already should have been delivered in July. However, things turned out differently.

Three weeks before our scheduled departure, the realization of the expedition became more and more questionable. Troubles and shootings in the refugee camps along the Virunga National Park were reported as well as some border conflicts. We heard that the borders from Uganda and Rwanda to Zaire were closed. Moreover, it was uncertain whether the IZCN would give their permission for the expedition. On 29 June, there were rumours that the Hutu militia had put a reward of \$ 1,000 on each American. Except for Esteban Sarmiento, all Americans now cancelled their participation. As our preparations were quite advanced, we decided to deliver the equipment.

The Long Way to Mt. Tshiaberimu

We crossed the Zairean border at Kasindi in mid-July and arrived at Mutsora, the headquarters for the management of the northern sector of the Virunga Park, without any problems. Our surprise action was successful. Kimpungi-Muckar had just returned from Kinshasa 2 days earlier, and he personally accompanied us to Mt. Tshiaberimu. One reason for this was perhaps that he otherwise cannot get there easily: Only one vehicle is available in the northern park sector, and it is often broken and not strong enough to manage the road up to the mountain.

It proved to be important to have Kimpungi-Muckar with us, as he obviously is a highly respected authority in the region. Without him we certainly would not have passed the many military and paramilitary checkpoints so smoothly. We heard gunshots every night we spent in Zaire.

Completely overloaded with seven persons and the equipment, it took us 4.5 hours for the last 37 km up the Tshiaberimu on a mountain road along incredible inclines and bends. Above 2,300 m, everything disappeared in dense mist. With a visibility range of about 5 m, the car crept the last kilometers at walking speed.

The park guards who are stationed at the edge of the forest close by the mountain village Burusi, gladly received our equipment. They live here with their families completely secluded from the rest of the world, and before our visit they had not received any material support. The following equipment from the *Berggorilla & Regenwald Direkthilfe* was handed over: 12 backpacks, 5 sleeping bags, 12 T-shirts, 12 pullovers, 36 pairs of socks, 12 rain ponchos, 12 water bottles, 2 tents, 3 terps, 1 binocular and 1 compass. Unfortunately, the arrival of the uniforms had been delayed due to the instable situation south of Goma. We do not know whether they have arrived meanwhile.

For the guards our direct aid meant an enormous reevaluation of their status in the whole region. Kimpungi-Muckar and the Zairean biologist Deo Mbula, who had been employed by the IZCN as special conservator for Mt. Tshiaberimu, also realized that the *Berggorilla & Regenwald Direkthilfe* is seriously interested in the protection of the gorillas there and that we do not just make promises, but also keep them.

A Future for 20 Gorillas

On the part of Zaire, first steps had already been taken for the better protection of this area: Kimpungi-Muckar had increased the number of guards to 21. This meant that the 12 sets of equipment we handed over could not cover the actual requirements. In 1997, the number of guards – according to IZCN plans – is to be increased to nearly 50. Now the *Berggorilla & Regenwald Direkthilfe* and other organizations should support the efforts of the Zairean authorities and help them to master their difficult task.

In addition, a four-wheel drive vehicle is urgently needed – it could be bought for about \$ 5,000 in Zaire – along with cameras, torches, compasses, radio sets and other material necessary for the long-term protection of the Tshiaberimu gorillas and their habitat. We promised the guards, Kimpungi-Muckar and Deo Mbula, that we would come back in 1997 and bring the additional equipment with us.

We are particularly grateful to the following persons, companies and organizations for their generous support: Sabena (Ms. Schmitter, Frankfurt; Ms. Johnson, Munich), Süd-West-Versand (Mr. Jung), Spedition Schenker (Mr. Paul), Wilhelm Möller (Uganda Wildlife Education Center), Amooti Latif (Chief Park Warden, Queen Elizabeth National Park) and John Hart.

Ulrich Karlowski, Ursula Karlowski and Denise Wenger

The Mountain Gorillas of the Mikeno in Zaire

There are seven habituated mountain gorilla groups in Zaire. The families of Rugabo, Rugendo, Ndungutse and Luwawa live exclusively in Zaire, the Faida group ranges in Uganda most of the year and is called "Nyakagezi group" there. The families of Kwitonda and Rafiki cross the border between Rwanda and Zaire.

The mountain gorillas of the Mikeno region within the Virunga National Park are in a state of shock, which has multiple causes. This is hardly recognizable during a short trip. However, it becomes apparent if it is compared to their behaviour before the crisis; the animals shift their range to search for security in other areas.

A considerable part of the Rwandan refugees in North Kivu have specialized in trade in natural products (charcoal, wood, game, etc.), obtained from the Virunga National Park. According to Nicolas Blondel (EU), approximately half of the bamboo on the Mikeno – which is an important food plant for the gorillas in certain seasons – has been cut by the refugees for the production and sale of various products (mats, baskets, construction etc.). Additionally, the observed poaching in the park has increased severely since the arrival of the refugees. The number of snares found in the park increased from 1994 to 1995 from 558 to 1408 (nylon) and from 355 to 1387 (wire). The number of confiscated machetes was 1588 in 1994 and 4078 in 1995.

All this disturbed the great apes so much that they changed their normal annual rhythm. Their usual stay in the bamboo zone from October to December was reduced to only 2 months last year.

In August 1995, within 2 weeks three gorillas (two silverbacks and one adult female) were killed by poachers who belonged to the local people of Jomba and Bukima. The motive was an inquiry by a mysterious dealer who wanted to buy baby gorillas. The poaching caused severe disturbances in the gorilla groups.

The Rugabo group is now being led by a blackback male. Within this family, the state of shock lasted only a short while; 2 weeks after the killing of two group members, the group accepted visits by tourist groups again. During the restlessness after the killing three juveniles and one subadult animal disappeared. Despite the investigations by the IZCN and several NGOs, no traces of the animals could be found. We assume that they fled and were integrated into wild gorilla groups.

At the end of August 1995, the silverback Luwawa was killed. As a result, three members of his family disappeared. Several days after his death, a wild silverback took over the group. Its size increased to a total of ten members due to a birth.

In November 1995, the group of Ndungutse probably split while staying in the bamboo zone at the border of Zaire and Rwanda. This region is very difficult to reach for our guards, since sudden attacks by the Interahamwe and the Rwandan army make this region very unsafe to pass. Earlier this year, Rugendo's family left the park for 1 month; they were expelled by attacks and poaching. They only returned when the IZCN, the IGCP and the local people drove them back into the park.

Immediately after the killing of the gorillas, the IZCN, together with the GTZ (*Gesellschaft für Technische Zusammenarbeit* – German Technical Aid), IGCP (*International Gorilla Conservation Programme*) and WFP (*World Food Programme*), established an effective, solid surveillance. Seven guard groups patrol near the gorillas day and night. The guards only discontinued their surveillance when the gorillas approach the border to the neighboring country or cross it. Such protective measures are very expensive and strenuous.

Size of the Seven Habituated Gorilla Groups in Zaire from December 1994 to June 1996

Name	12/94	03/95	06/95	09/95	12/95	03/96	06/96
Rugabo*	20	23	23	17	17	17	13
Rugendo	10	13	13	14	13	14	15
Faida	6	6	6	6	6	6	8
Kwitonda	6	7	6	6	6	7	8
Luwawa*	12	12	12	10	10	12	12
Ndungutse	31	31	31	31	24	25	25
Rafiki	11	11	11	11	11	11	11
<i>Total</i>	<i>96</i>	<i>103</i>	<i>102</i>	<i>95</i>	<i>87</i>	<i>92</i>	<i>92</i>

* affected by poaching

The GTZ and other organizations recently restricted their activities to immediate measures for the conservation of the park. The income from gorilla tourism decreased since so many Rwandans have sought refuge in Zaire. Since the attack at Kanombe (Bukima), two attacks on the border post of Bunagana and a recent attack attempt at the guard post at Jomba by Rwandans, the situation has become alarming.

Which strategies will ensure the long-term conservation of the gorillas in the current crisis? The proceeds from tourism have dropped and the GTZ and NGOs are withdrawing in spite of the presence of the Rwandan refugees and their encroachment to Rwanda during which they come very close to the ranges of the gorillas.

The poachers who had killed the gorillas to

obtain infants for sale have been released from prison and returned to their villages. The gorillas can only be protected from further poaching by an open and close cooperation between the nature conservation authority and the local people. Attempts to obtain gorillas must be reported. Unfortunately, such a cooperation does not exist yet, but will be developed in view of the problems faced by both sides. The interventions of international aid organizations do not help to solve the problem as they include only emergency and immediate measures and have not developed long-term strategies.

The mountain gorillas of the Mikeno face the following problems:

- Effective cooperation between the IZCN and the local people is lacking.
- There exists a black market for young gorillas and poachers who are willing to cooperate.
- The danger of armed encroachment between Rwanda and Zaire is high.
- The refugees invade the park in large numbers, destroying the park and the habitat of the gorillas in their search for natural resources.

Claude Sikubwabo Kiyengo and Norbert Mushenzi Lusenge

Recently we heard that at the end of November, 1996, the national park infrastructure on the Zairean part of the Virunga Volcanoes was destroyed and a number of guards killed. The gorillas seemed not to have been affected, however.

Pygmies in the Kahuzi-Biega National Park

Even during colonial times, attempts were made to drive pygmies out of their traditional habitat, the primary forest. Officially, they were relocated from the forest in 1970, when the national park was founded. Even today they feel as if it had happened only yesterday. They are longing for their old home because they find it very difficult to get on in the world in which they are now forced to live.

In this study, members of the Twa tribe are called "Mutwa" (singular) and "Batwa" (plural). For the pygmies, "Mutwa" is not derogatory. During a period of 80 days from 1 October 1995 to 28 February 1996, we visited 37 villages in the zones of Kabare, Kalehe, Bunyakiri and Kalonge and interviewed the residents of 14 villages in the Kabare and Kalehe zones, close to the park border. First, we started a group discussion in the village centre and afterwards we met with those individuals who had been mentioned to us as possible sources of information. Often these were the village chiefs. We were able to talk to them in private, as we frequently spent the night in their homes. Also, it is easier to ask questions while sitting around the fire together.

Social and Cultural Life

Formerly, the Twa wanted to belong to the Bantu who were richer and more educated and therefore they did not want to be called "Twa". However, since President Mobutu declared them to be equal citizens of Zaire, the Batwa of the Kahuzi-Biega National Park area have been proud of their cultural identity. They also regard themselves as the original inhabitants of the country. Only 19 Batwa live in Kalonge in more than five Bantu villages. All other Batwa villages are separate from the Bantu villages although they have the same names.

Most of the Batwa we interviewed were born in the forest, where they led a nomadic life and practised hunting, gathering and counselling. When they were nomadic, they built small, ephemeral round huts from branches and leaves without windows. Some Batwa have started to imitate the mud houses of the Bantu. About three quarters of these houses are leaking, because they are not covered properly. The greatest problems in constructing mud houses are that the Batwa usually do not own any property and that the construction of those houses is expensive.

The village is the socio-economic unit for all Batwa. In general, it consists of about ten houses with 20 to 30 people: closely related men with their families, the parents of their wives and the husbands of their sisters. The village chief is usually the oldest man of the clan and every visitor to the village has to make a courtesy call to him.

Their position as outsiders welds the Batwa together. In the few villages inhabited by Bantu and Batwa they form small, isolated subgroups in an attempt to protect their cultural identity. In spite of this, the two tribes usually live together in harmony. The Batwa speak the language of the dominant local people.

Health

The establishment of the national park drove the Batwa out of the forest and prevented them from hunting. They have been undernourished ever since. We met several people who claimed not to have eaten any meat, fish or other food rich in protein for more than a year.

Many diseases develop due to a lack of hygiene. Batwa never wash their clothes and defecate in the bush or close to the village. They are afraid that a member of the family will die if they dig a latrine. Intestinal parasites, malaria, pneumonia, bronchitis and children's diseases are very common.

For the Batwa, diseases can have natural or supernatural causes. They treat them with traditional medicines made from leaves, bark, animal skin, feathers and soil. Healers are usually males, whereas mostly women are engaged in sorcery. Knowledge about traditional medicine is slowly decreasing because the experts die and do not pass on their knowledge. In addition, the drugs which were collected in the park are no longer available. Modern drugs are now being offered to them, but the Batwa cannot afford them.

Our survey found that both the birth rate and mortality, especially among children and young adults, have increased significantly.

Education

In the 14 villages studied, there were only ten people who had attended primary school up to the fifth grade. Currently, not a single child is attending school. One reason for this is the nomadic life style of the Batwa: during hunting and gathering trips the children are taken out of school for several months at a time. Other problems are the school fees and the long distances.

Practically all Batwa at the Kahuzi-Biega National Park are illiterate. Although literacy centres for Batwa exist, they are too far away.

Batwa Ceremonies

Batwa marry almost exclusively within their own people. The parents of the bride receive a gift. Sometimes two families simply exchange daughters. In most villages, girls get married when they are 14 years old and boys when they are 17. Polygamy is widespread, but the man must be able to afford it. Mixed marriages between Bantu men and Batwa women are tolerated, but only poor Bantu marry pygmy women.

After a birth, feasts and other ceremonies are held. Men undergo initiation rites which always take place outside the village. A death is always considered to have a supernatural cause. After someone has died, Batwa usually move their settlement. However, today this only happens when the village chief has died because there is not enough space.

Status of the Batwa in Public Life

The Batwa's relationships with the authorities are difficult as can be expected in the case of illiterates. In order to obtain an identity card, a birth certificate is necessary which most Batwa do not possess, and without these papers they cannot move freely.

The Batwa have always been in communication with the traditional authorities of their surroundings. In the Kabare and Kalehe zones, the Batwa enthrone the mwami (king). Therefore, among the Bushi people, Batwa are always present in the king's court. However, these days the traditional chiefs often terminate the partnership with the Batwa.

Socio-economic Situation

The biggest problem facing the Batwa is property rights: Usually they do not own any land. Some buy a small patch and cultivate it in a traditional way, others lease the land for one season and give part of the harvest to the owner.

The Batwa cultivate many different field crops: manioc, beans, maize, potatoes, hemp etc. However, their families cannot survive on this alone, because the harvests are rather small. The Batwa close to the Kahuzi-Biega National Park cultivate mainly hemp which does not need much care. They use most of it themselves and sell some of it to the Bantu.

In most villages close to the park border, Batwa work in agriculture for the Bantu or as porters, as herders and in other physically demanding jobs. The long separation from their home during seasonal work frequently has a negative impact on their families.

Since the national park was founded, the Batwa living near the park no longer hunt there regularly. Some of them hunt in secret by laying traps. Today this has stopped almost completely, as Batwa are employed as trackers and unskilled labour in the park. They still hunt moles, mice and wild cats outside the park, but sell these only rarely.

In the Batwa villages, people usually manufacture their own commodity articles. Some of them make pottery, others produce wickerwork, baskets, oars and mortars. Often they cannot do these things any more, because they need raw material from the park. Some of them obtain wood or other materials secretly.

For about 10 years Batwa have been employed in the Kahuzi-Biega National Park in considerable numbers. They work mainly as trackers but also on road maintenance and in heavy labour. The Batwa who are employed in the park integrate themselves slowly into the society. They are proud of their work and arouse the envy of others.

Many Batwa consume a lot of alcohol: they spend three quarters of their money on it.

Possibilities for Improvement

CEPZA, the Pentecostal Community of Zaire, is attempting to convert the Batwa living near the Kahuzi-Biega National Park and to improve their standard of living. CEPZA operates ten literacy centres, but none of them is working. Moreover, the church distributed hoes and machetes for agriculture without determining beforehand if the people concerned had fields. The Batwa immediately sold all the hoes.

The GTZ project developed small projects in the Batwa villages of the park border zone. Within the framework of these projects, tools for cultivation and seeds were distributed. However, individual circumstances were not taken into account, and therefore the projects were not very successful.

The PIDP (*Programme d'Intégration et de Développement du Peuple Pygmée au Kivu* – Program for the Integration and Development of the Pygmy People in Kivu) was represented in every village covered in our study. It can realize its activities only to a very limited extent because there is no money or material. It is an organisation run purely by and for Batwa. Its support of agriculture and poultry farming has had a few successes. UNICEF Bukavu enrolled 35 young Batwa in schools, after the PIDP asked them to.

Suggestions to Support the Batwa

As the Batwa can be integrated into society through the introduction of agriculture and livestock breeding, it is these areas where they have to be supported initially. They should have the opportunity to cultivate their own soil and they should be provided with tools and seeds. However, they have to be sensitized for this kind of work and to be encouraged continually. Latrines should be dug to improve hygiene. Education on nutrition and child care is needed. Vaccinations could help to fight children's diseases. Traditional medicine should be promoted.

To improve the standard of education, enrollment of children in primary schools that are not more than 5 km away should be promoted. Sensitization of the parents to the necessity of their children's schooling is required, as is encouragement for the children. Teachers should be trained, literacy centres should be built, teaching materials should be made available and the Batwa adults should be sensitized to the importance of learning.

Craft work should be promoted and even more Batwa should be employed in the GTZ project and in the park. The Batwa should be encouraged to build houses like the Bantu if they no longer live as nomads.

For these endeavours to succeed, the Batwa first have to decide how they envisage their future development. They alone should decide where their future lies.

Preliminary Report on a Survey of the Southern Itombwe Massif

The montane forests of Africa's Albertine Rift are a center of endemism and the most species-rich of all the montane forests of the continent. This makes them of great international conservation importance. Of the Albertine Rift montane forests, the Itombwe Forest is the largest, most diverse and, from a conservation standpoint, probably the most important.

Itombwe is located in eastern Zaire off the north-west corner of Lake Tanganyika (see map on page 14). While the Itombwe Massif itself might be defined by the area of high ground above 1,500 m a.s.l., the region of conservation importance descends to about 600 m and covers roughly 16,200 km² – 6,400 km² below 1,500 m, 4,900 km² between 1,500 and 2,000 m, and 4,900 km² above 2,000 m. Various forest types cover roughly 11,800 km² (73%) of the area.

Itombwe is poorly known biologically. This is due largely to the remoteness of the area and to political disturbances. Preliminary data obtained during the 1950s and 1960s on the avifauna by A. Prigogine, and on the amphibians by R. F. Laurent, show that Itombwe is an extremely important site for bird and amphibian conservation.

From March to June 1996, Omari Ilambu lead a WCS (*Wildlife Conservation Society*) survey of the large mammals and habitats of the Itombwe Forest. The main focus of this work was to assess the distribution and numbers of gorillas and chimpanzees. For 4 weeks in April and May, Tom Butynski and John Hart joined the survey to gather information on the vegetation, mammals and birds in south-east and south-central Itombwe. This report provides general background information on Itombwe, a summary of our findings, an assessment of the conservation values and problems of the area visited, and recommendations for conservation action.

This survey was financed by WCS. Tom Butynski's participation was funded by *Berggorilla & Regenwald Direkthilfe* and *Zoo Atlanta*.

General Description and Background

The size and varied topography of Itombwe, together with its proximity to Africa's second largest lake, give rise to much variation in temperature, rainfall and humidity over the region. This great variation in climatic conditions is one of the more important factors responsible for maintaining the high biological diversity of Itombwe. Mean annual rainfall varies from nearly 1,200 mm in the extreme south to 3,000 mm in the north-west.

A diversity of vegetation types contributes to Itombwe's richness. Its forests include a continuum from lowland forest (less than 1,200 m a.s.l.), transition forest (1,200–1,500 m), montane forest (1,500–2,200 m), bamboo forest (2,200–3,000 m) and afro-montane vegetation (over 3,000 m). Above 1,500 m, approximately 8,500 km² of Itombwe is covered by montane forest, 1,500 km² by bamboo and 500 km² by gallery montane forest and grassland. Gallery montane forest and grassland hold some of the most beautiful and unique habitats of the region, including high elevation alpine meadows interdigitated by tongues of forest, and large areas of upland savannahs which are nearly devoid of trees.

The extent and floristic composition of these areas today is determined by human activities. These upland grassland/forest ecotones are among those most threatened by incursions of agriculturalists and pastoralists. Systematic floristic inventories of Itombwe are in their infancy. Nevertheless, a high plant diversity and endemism is indicated for several families, including Orchidaceae, Acanthaceae and Begoniaceae, and by the genus *Impatiens*.

A total of 563 species of birds are recorded for Itombwe. Of these, about 60% are "forest dependent". This makes Itombwe the richest single forest for its birds in Africa; it holds at least 83 montane forest bird species. Of the 104 bird species characteristic of transition and montane forests of the Albertine Rift mountains, no fewer than 98 (94%) are present in Itombwe. Thirty-four (89%) of the 38 montane and transition forest bird species endemic to the Albertine Rift occur in Itombwe. There are three birds which are endemic to Itombwe: the Congo bay (Itombwe) owl *Phodilus prigoginei*, Schouteden's swift *Schoutedenapus schoutedeni*, and Prigogine's nightjar *Caprimulgus prigoginei*. Itombwe is now ranked as the single most important forest for bird conservation on continental Africa.

As of our survey, the mammal list stood at 56 species. Most notable among these are gorilla, chimpanzee, elephant, leopard, bongo and golden cat. Two endemic shrews occur. Based upon our own experience in other forests of the Albertine Rift it is obvious that the mammal list for Itombwe remains far from complete.

The Survey

The main objectives of the survey were to: 1) determine the current distribution and status of Grauer's gorilla and chimpanzees in the Itombwe Massif, 2) evaluate the impact of human activities on these and other large mammal species, and 3) assess options for conservation in the region. There were up to four scientific teams working simultaneously during this survey.

Survey methods for the apes included line transect counts of nesting sites, follows and nest counts (for gorillas), and interviews with local villagers and hunters. The teams made special efforts to visit the 17 known areas in Itombwe where the earlier expeditions of Schaller and Emlen (in 1959) and Jefferson Hall (in 1991) located gorillas. In addition to its field teams, the expedition benefited by the participation of an IZCN (*Institut Zairois pour la Conservation de la Nature*) education team led by Yuma Mkeyo and Radar Birhashirwa. The education team was instrumental in establishing good working relations with local populations in the areas we worked. A "bird survey team", comprised of three biologists and seven technicians/porters, conducted research from 9 April to 8 May in the extreme south-east corner of Itombwe between Nundu Village (830 m) and the bamboo zone (2,350 m) located about 7 km west of Kanguli Village.

Results

A total of 252 species of birds were found during this survey. A few additional species (owls, nightjars, crakes) will likely be identified once their tape recorded vocalizations are reviewed. Twenty-five bird species were found which were not on the Itombwe list. Excluding those, we found 41% of the birds listed. We located 57% of the 37 bird species endemic to the montane and transition forest of the Albertine Rift, or 64% of the 33 regional endemics known to occur in Itombwe.

One bird species, the Congo bay owl, deserves particular mention as it is perhaps Africa's least known bird. This owl is

known from but the type specimen, a female, obtained in Itombwe 45 years ago. On 1 May we mist netted a female Congo bay owl at 1,830 m in gallery montane forest. It now appears that the Congo bay owl is a bird of the montane forest-grassland mosaic and gallery montane forest. These are habitat types which are poorly represented in Equatorial Africa but which are widespread in Itombwe.

Based upon the data obtained during this survey, it is concluded that south-east Itombwe, from 1,800 to 2,350 m a.s.l., has a rich avifauna that includes many species which are regional endemics and/or of particular conservation concern.

A total of 35 species of mammals other than primates were also recorded. Notable finds were African linsang *Poiana richardsoni*, which were common among the animals taken by hunters in snares. Lestrade's duiker, a subspecies of the *Cephalophus callipygus/weynsi* group, was present in relatively good numbers. This subspecies is endemic to the Albertine Rift and rare over most of its small distributional range. Elephants were present but in very low numbers, probably as a result of considerable recent poaching.

Thirteen species of primates are known to occur in Itombwe. During this survey we added three species of primates to the list (*Otolemur crassicaudatus*, *Galago matschiei*, *Galago thomasi*) and confirmed the presence of eight others. One additional species, l'Hoest's monkey *Cercopithecus lhoesti*, was reported by hunters. Based on its habitat requirements and known distribution, this species is expected to occur in Itombwe. The owl-faced monkey *Cercopithecus hamlyni* remains a mystery. It is expected to occur given its presence in the Kahuzi-Biega area to the north. No hunter, however, could give us a description of this very distinctive monkey and the species may indeed be absent. With at least 13 species of non-human primates, Itombwe is one of the richest sites in Africa for this taxa. Two of the species encountered during this survey are classified as "endangered" (gorilla and chimpanzee) and two are "near-threatened" (*Galago matschiei*, *Procolobus badius*). We conclude that Itombwe is a particularly important site for primate conservation in Africa.

Gorillas are localized in Itombwe to geographically discrete areas, and are apparently absent, except possibly for dispersing animals, from large areas. Prior to our expedition, 17 "gorilla areas", ranging in size from less than 100 km² to several hundred square kilometers, were identified in the 1959 survey of George Schaller and John Emlen. The WCS/IZCN expedition was able to visit 12 of these areas. Gorillas or their signs were observed in all but four. The apes are likely now absent from most of the five areas which this expedition did not survey. Significantly, we were able to document the presence of two, previously unknown, "gorilla areas" in Itombwe and map a major extension to a third. At this point, we can not provide an estimate of the number of gorillas in Itombwe. An analysis of the data is continuing and we hope to provide further information in the near future.

The highly localized distribution of gorillas in Itombwe may be linked to habitat requirements. Gorillas were found at elevations from less than 1,100 m in the transition forest zone to over 3,000 m near Lac Lungwe. Although most of the sign and sightings of gorillas were in secondary vegetation, this species was also present in agricultural fields, at the savannah border and on the edge of human settlements. We also found gorilla signs in the bamboo zone, but at low densities, suggesting that this habitat, which in Itombwe covers more area than in any other place in Africa, may not be preferred by gorillas or be used only seasonally. Gorilla sign was notably rare or entirely absent throughout much of the primary high canopy forest.

In contrast to gorillas, chimpanzees are more widely distributed, occurring in primary forest as well as in secondary vegetation. We did not find signs of chimpanzees in the bamboo. Although we can not yet provide estimates of chimpanzee numbers for Itombwe, they are clearly more abundant than gorillas. In addition, they appear to occur in larger groups than gorillas.

Conservation: Status and Options

Despite a low human population density over much of Itombwe, the fauna is at high risk from well established and growing commercialized hunting which provides meat for markets as far off as Kamituga and Uvira. The impact of this hunting has been devastating on duikers and many primates. This is especially the case for northern Itombwe, but hunters are rapidly expanding into less heavily exploited areas in the south. We expect that similar depletion of the fauna will follow here as well.

Gorillas and chimpanzees are hunted for meat by some hunters. Other hunters, however, said they do not hunt them, citing the official protection status of these two species and/or dietary taboos. Even these hunters, however, said that both apes are occasionally killed in snares set for other animals and that some gorillas are killed because they are aggressive towards humans, especially in the gardens and around villages. We were shown a number of skins and skulls of gorillas by villagers throughout the area surveyed.

Large areas of Itombwe's natural habitats do indeed remain intact, but current trends towards deforestation, exacerbated by a famine caused by corn blight in the highlands, are extremely worrying. Particularly vulnerable is the species rich montane gallery forest/alpine meadow complex, where the woodlands are under attack by the farmers and the meadows are overgrazed by Tutsi pastoralists who have made their way into this region over the last 50 years.

Creating incentives and initiatives for the conservation of Itombwe in the face of growing insecurity stemming from the civil wars in neighbouring Rwanda and Burundi will be difficult, especially since there is also growing ethnic tension between Tutsi pastoralists and Bembe farmers on the Plateau. Nevertheless, the IZCN education team reported an interest on the part of several of the Bembe chiefs to control hunting in their traditional chiefdoms. This suggests that there may be options for new approaches to conservation, such as hunting cooperatives which are jointly managed by the chiefs and conservation NGOs. In contrast to the farmers, few pastoralists expressed much interest in wildlife or forest conservation. Both Bembe and Tutsi, for different reasons, were involved in activities leading to rapid loss of natural habitats.

Ethnic strife may continue in the region. Ironically, this may cause some areas to be depopulated as people flee conflict. This could actually lower current deforestation and possibly market hunting, thus providing a window of recovery to badly overexploited land and wildlife.

The need for conservation of Itombwe's tremendous biodiversity is fast becoming critical. At this point, a full evaluation of the options and needs must await establishment of long-term projects on the ground. Much remains to be documented of the region's flora and fauna, and realistic conservation options will depend upon these findings. Equally necessary are projects which can establish appropriate educational and institutional-building capacities and put conservation into action. However,

there can be no return by assessment teams to the region, or evaluation of conservation options until security returns. Recommendations at that point would depend upon the new political orientation of the region.

Postscript: As of late December 1996, the Itombwe area remains a center of conflict in the spreading civil war in eastern Zaire. The Mulenge Mountains in northern Itombwe are where the rebellion was initiated in November. There were major battles in December in the Fizi and Mwenga areas, with counter offensives by Zairean government troops repulsed by rebels. It is not currently possible to establish what impact the war has had on the fauna and habitats in the region.

Thomas M. Butynski, John A. Hart and Omari Ilambu

Visit to the Mgahinga Gorilla National Park in Uganda

Two years after the Mgahinga Gorilla National Park Project was abruptly ended by Klaus-Jürgen Sucker's mysterious death, I visited my former home on the northern flank of the Virungas in southwestern Uganda. For part of the time I was accompanied by Denise Wenger and Ulrich Karlowski.

I was amazed to drive on the recently improved road from Kisoro up the mountain to the national park's headquarters. This road used to be passable only with a four-wheel drive vehicle or on foot. Today this is a road any vehicle can use.

At the headquarters, the rangers and I were equally happy about our reunion. It took days to exchange all our news. At the end of the visit a wonderful and sometimes very moving party took place with songs and joint dances in one of the metal round huts of the Mgahinga Gorilla National Park Project. I also learned a lot about the developments and difficulties of the national park from park wardens Richard Bukowa and Adonia. For instance, for the first time in 40 years, one mountain gorilla family stayed continuously in the Ugandan part of the Virunga Conservation Area for 6 months without moving into Zaire. From January until approximately mid-July, the Nyakagezi group, which is habituated to tourists remained in the Mgahinga Gorilla National Park (MGNP) and was visited by tourists almost daily. It is very likely that this group will return by the beginning of the rainy season in October. It will be interesting to see how long their total stay will be in the MGNP in 1996. Unfortunately, the rangers discontinued their patrols to other gorilla groups which are not habituated to humans because they expect extra payment for this which they do not receive at the moment. Therefore, we could not learn anything about other gorillas in the MGNP during our visit.

Observations in the northwestern area of the MGNP indicate that the growth of the vegetation cover in zone 2 (the formerly illegally cultivated area) has slowed down. As was already indicated in the middle of 1993, grasses are still dominant in large areas. The immigration of bushes and woody plants into the grasslands is still limited to the area along the forest edge. I had a positive impression of the trees planted in zone 2 in 1993. Height measurements and an estimate of the seedlings' survival rate indicate that the planting of *Hagenia abyssinica* was especially successful. However, seedlings of *Bersama abyssinica*, *Tabernaemontana johnstonii* and others also survived the first 3 years well.

The human population near the park still accepts the protected area. No agriculture or cattle grazing by Ugandans was noted within the park. However, at night cattle apparently enter the park from Rwanda. The forest area in the Parc National des Volcans (the Rwandan part of the Virunga conservation area) has been reduced: a part of the forest at lower altitudes was "transformed" into farmland.

A part of Klaus-Jürgen Sucker's conservation project was the planting of a hedge of local trees (mainly *Erythrina abyssinica*) along the northern border of the national park. In certain parts a rock wall was built additionally to protect the farmers' fields from the park's game. In the vicinity of the headquarters, the hedge has recently been complemented by a rock wall.

Staff and Infrastructure

Uganda National Parks (now Uganda Wildlife Authority, UWA) has increased the number of park wardens responsible for Mgahinga from three to four. Chief Park Warden Fred Kateego is in charge. Currently, two *Peace Corps* volunteers are working in the MGNP within the areas of tourism development and nature conservation education. Under their guidance, the building of trails for tourists who do not visit the gorillas was organized. For instance, they were responsible for the digging of drainage ditches in the Rugezi swamp, an afro-montane swamp in the saddle between Sabinyo and Gahinga. Each ditch is 40 cm wide and approximately 6 m long, and they cut across the trail through fragile vegetation consisting of *Cyperus*, club mosses, immortelles and mosses all the way down to the rock. After all, the tourists must not get their feet wet when they hike through the core area of the national park, even if this may threaten the sensitive ecosystem in the long run!

The risk of fire in the eastern area of the MGNP on Muhavura continues to be a problem. Fires start on fields in Rwanda and spread from there to Uganda. The national park administration intends to cut fire breaks to prevent fires from spreading.

The park administration sees the invasion of the Australian acacia species *Acacia mearnsii* in zone 2 as another problem. The rangers are using the wood of *Acacia mearnsii* as fire wood to slow down the spread of this exotic tree species, because otherwise it may displace the local flora in the long run. This strategy was followed already in the Mgahinga Gorilla National Park Project. Park warden Richard Bukowa, who is responsible for law enforcement and tourism, supports the use of this tree species as the currently only sensible way to implement the multiple-use concept of CARE.

In addition, we were told that there is a risk of disturbance to the sensitive alpine vegetation in the area of the Muhavura mountain top if too many tourists climb up. Richard Bukowa is considering to restrict their number to fewer than 10 per day.

Situation of the Rangers of the Mgahinga Gorilla National Park

Salaries and top-ups. CARE supported the rangers with Uganda Shillings 20,000 (ca. \$ 20) per month until June 1996. Since then the rangers have received only their Government salary, which is also Uganda Shillings 20,000 monthly.

Equipment for the rangers. In the whole phase when CARE supported the national park, about 30 rangers received twelve sleeping bags and approximately the same number of backpacks and sets of rain clothes. The rangers complained about insufficient equipment and the lack of support since the abrupt end of the Mgahinga Gorilla National Park Project in June 1994.

Only gum boots ("Uganda quality") were made available by CARE in sufficient numbers (for each ranger).

Some of the rangers are starting to supplement their low salaries with additional income besides their ranger activities. This, of course, is not an advertisement for the park administration and it also means that the motivation for the main task continues to decrease.

Ursula Karlowski

Liz Macfie drew our attention to a mistake in the last issue of our journal: We wrote that MGNP had no vehicles, but she said that the park had received a pickup by CARE and a Suzuki by USAID. Moreover, IGCP recently provided a pickup for tourism development.

Case Report on Scabies Infection in Bwindi Gorillas

Uganda Wildlife Authority (UWA) and the International Gorilla Conservation Programme (IGCP) have been working together to treat a skin disease in one of the gorilla groups in Bwindi Impenetrable National Park. This case has involved both veterinarians and park managers in the attempt to decipher the cause of the problem and to treat it, while at the same time preventing spread to other gorilla groups, and discovering how the infection was introduced into the gorilla group if not naturally present in the population.

In August one member of the Katendegere Group was reported to have small patches of hair loss. At the time, the park and IGCP staff were not overly concerned as gorillas can have bald patches as results of scrapes or wounds, among other causes. However, this condition progressed and by the end of August, a vet check by the IGCP veterinarian and park staff showed that both young animals in the group had more significant hair loss. The 6 years old male, Kasigasi, had patches of hair loss visible over his abdomen and on the back of his legs. The youngest animal in the group, an 8 month old male, showed more serious hair loss. Gladys Kalema, the Veterinary Officer for UWA in Kampala was contacted and she immediately travelled down to Bwindi with Richard Kock, a visiting wildlife veterinarian from Kenya Wildlife Services.

Kasigasi was darted and immobilised for diagnosis and treatment. On close-up examination his condition was much more severe than it appeared from a distance. He was covered with skin lesions consistent with scabies infection (*Sarcoptes scabiei*). Samples were taken for laboratory diagnosis, and he was treated for scabies and bacterial infection. The Makerere University Veterinary Laboratory examined the samples and confirmed the diagnosis of scabies.

Sarcoptes scabiei is a mite that infests the skin of many animal species including primates. Domestic animals commonly are affected, and in dogs it causes one type of the common skin disease known as mange. Humans can also have scabies, and it is common in communities around the park. Scabies is very infectious and direct contact with an infected animal or person is not required for transmission.

Although the vet team was extremely interested in the source of infection, the priority action was to treat all the animals in the group and to examine other gorilla groups for signs of infection. Luckily the Katendegere group appears to be the only group with clinical signs, so it is assumed that other groups are not affected. The follow-up to the diagnosis of scabies has included darting all of the other animals in the group. The adult animals in the group, one silverback and one female, showed little if no symptoms and have simply required treatment by remote injection via a dart gun. However, the adult female was carrying the small infant who was becoming increasingly bald and weakened by the infection. An infant of this young age of 8 months is still carried and protected by his mother, who in this case is a very shy female, often difficult to see in the best of circumstances. The infant was too small to treat simply with a dart fired from a distance, so the team attempted to dart and immobilise the mother in order to hand-grab the infant for treatment.

The difficulties of working in the "Impenetrable" forest became painfully clear during attempts to save the infant gorilla. The female was extremely nervous and she hid in the deepest bush whenever the vet team approached. In addition, the silverback continually placed himself between the female and the team, precluding any attempt at darting. The brief views of the infant showed him to be very thin and almost completely bald, leading to the conclusion that he was likely to die. This prediction proved sadly true as the emaciated body of the little baby gorilla was found near the group's nests one morning.

Gorilla females normally carry their dead infants for a number of days before dropping the body and the fact that this one was left the first morning after his death might suggest that he had been weak and immobile for a period such that the female had already begun to lose maternal attachment towards him.

This was a very sad outcome for a team of rangers and vets who had tried a number of times to save this little gorilla. Additional samples taken at the autopsy of the infant male confirmed the diagnosis of scabies.

The immobilisation of Kasigasi marks the first time a Bwindi gorilla has been darted, so there is no historical data on presence or absence of scabies in this population. However, the nearby Virunga population has a long history of gorilla immobilisations for emergency treatment, and scabies has not yet been reported. Therefore this diagnosis is the first known case of scabies in a wild mountain gorilla. This is cause for concern about the source of infection, and a sample has been sent to an entomologist to attempt to identify if the mite is of human or animal origin. If it is possible to identify the source, it will help park managers to narrow down the list of possible management actions to take. For example, if the source is domestic animals, stricter controls of animals herded along public paths through the park might be considered. Alternatively if the source is human, the park must consider all the possible means for infection from humans including the different activities that bring people into the park, both legally and occasionally illegally. From the local people's perspective, the gorillas also range outside of the park in a similar "illegal" fashion to raid banana plantations and this is another potential source of infection from both humans and domestic animals. The park and IGCP are continuing efforts to prevent re-infection of these or other gorillas in Bwindi.

Liz Macfie (from: IGCP Update 2, September 1996)

The silverback leader of the Katendegere group, Mugurusi, died from old age in May this year. Following his death, a blackback left the group. Currently, the group is led by a young silverback who has a broken wrist, but this does not hamper him severely.

The Group has only three members now, and the tourist visits are being restricted. Only four tourists are permitted per day. No further advance bookings are made by UWA. Any permits not sold in Kampala are sold in Buhoma on the stand-by basis. IGCP and UWA have just started to habituate another group, but it will take 1–2 years until it can be visited by tourists.

On 7 May, a lone silverback gorilla in Bwindi had a conflict with local people in a village close to the park boundary. He bit one person into the shoulder and dislocated an elbow of a young girl. Two veterinarians managed to drive him back into the park. *From: Digit News Europe, Winter 1996/97.*

Should We Consider the Translocation of Gorilla Populations?

In our last issue, Esteban Sarmiento remarked that it may become necessary soon to think about translocating small gorilla populations to other areas because they are in danger of extinction. Such an undertaking would be very risky and costly. But these are not the only problems that would arise.

First of all, many questions should be answered, like:

- Are suitable areas available at all?
- How big would a suitable forest area have to be?
- Which other requirements should the new habitat have?
- Which situation (threats, critical population size) could trigger the initiation of the translocation?
- How many individuals from how many groups should be caught and translocated?
- How would the gorillas be caught?
- Who decides when and where which animals will be translocated?
- Who coordinates the whole project.

We think that a discussion should be started soon to develop a clearer idea whether such translocations are feasible at all and how they could be realized. This article's aim is to contribute to this discussion. Several experts are here explaining their opinion about the subject.

Angela Meder

Statements

Considering the popularity of gorilla tourism, translocation should have been given serious thought long ago. By allowing tourists access only to captive-born animals reintroduced to natural habitats, any ill-effects tourism may have on the highly endangered gorilla populations can be avoided. As it is, it may be necessary to use translocation to save natural populations that have been jeopardized because of tourism. Growth of human populations surrounding parks and overtaxing the natural buffer zones protecting endemic fauna and flora, increased water use (bathing drinking and voiding) within and around the park, and increased exposure of gorillas to humans from all over the world are all products of tourism which can have serious health consequences. The case of Gombe stream reserve where chimpanzees are now crippled by polio (a water born disease) and suffer yearly bouts of fatal epidemics illustrates the magnitude of this threat quite well.

Unfortunately, at the moment if we needed to translocate gorillas we have little of the information necessary to insure long term success. We need to know more about the qualities of the gorilla's environment and of the plants and animals that maintain it. Gorillas may not presently be using all of the environments that may be suitable to them. We must do research that allows us to predict based on what the animal's needs are, what environments will support them. In this regard, we must also further research differences between gorilla populations, and their corresponding needs.

What we know of the social system of eastern gorillas suggest that it may be best to move them into uninhabited areas as a group together with a single young solitary male. Into areas already populated by gorillas, it would be best to introduce young adult females. There are a number of drugs, with antidotes administered through a dart gun which can subdue animals for transport. These are relatively safe, if the animal's body-functions are monitored.

Unfortunately, the money, and subsequent political bureaucracy that gorilla conservation attracts worldwide seriously challenges coordination and effective decision making on the part of "true experts". Presently such coordination may be the greatest obstacle when survival of some gorilla groups may ultimately depend on translocation.

Esteban Sarmiento

In 1986, Juichi Yamagiwa and his team published an article in *Primate Conservation* after censusing the gorilla population in Masisi, eastern Zaire, and made the following recommendations:

The gorillas and their habitats must be separated immediately and completely from areas of human activity. If the gorillas maintain their present contact with the local people, they can easily become infected by human diseases. If the gorillas continue to range within such isolated habitats, inbreeding will have deleterious effects on their reproductive success.

The separation plans should consider: 1. the area necessary for several gorilla groups to survive. 2. the vegetation types necessary to provide the gorillas with a variety of food resources throughout the year, 3. a bridge zone which would permit gorillas to come in contact with neighbouring populations, and 4. a buffer zone which would prevent gorillas from coming in contact with the local people.

In order to assess and satisfy these conditions, a detailed survey of the animals' ecology and habitat preferences should be undertaken prior to the proposed separation, which cannot be successful unless such factors are taken into account. A gorilla conservation program must take proper account of their movements and ensure adequate inter-unit relationships. Future research should also embrace the ecological traits of the local gorilla population, since the monthly or annual range size and feeding behaviours of gorillas vary from region to region.

If such complete separation cannot be expected, relocation of the gorillas should be planned as soon as possible. In this case, consideration must be given to the most suitable habitats for them as well as to the effects of relocation on the animals

themselves, the fauna and flora, and, especially, other gorilla populations.

The results of our survey suggest that the ecological and external characters of the Masisi gorillas may not resemble those of gorillas in the Virungas or Kahuzi regions but rather those of the Itebero-Utu region. It is said that gorillas immigrated into the Masisi region over the last several decades from lowland forest near the Walikale region. It is recommended, therefore, that any relocation be done to one of the protected areas in the lowland forests. However, in order to respect their genetic, morphological, ecological or behavioural independence, we should not mix gorillas who belong to different local populations, so the best solution for relocation would be to find a suitable unoccupied space near the Masisi region.

Recently I have been informed by the local people of Masisi that the Masisi gorillas have ended to exist. A strong conflict between tribes in the Masisi region in the past 5 years has resulted in severe hunting and complete destruction of the gorillas' habitat in this area. Such a catastrophe might occur anywhere in Zaire. Translocation is not the optimal method to preserve gorillas' genetic diversity and viable populations, but is the most effective one to save endangered populations from becoming extinct. We (scientists) need to organize the international committee urgently to discuss this matter and to decide the future action plan with IZCN (*Institut Zairois pour la Conservation de la Nature*), local governments of Zaire and NGOs of various countries.

Juichi Yamagiwa

It is clearly much better, ethically and economically, to translocate rather than to reintroduce. As much income and expertise as possible should be generated in the habitat country. One has to find adequate space, with adequate food and protection. Intact social groups must be moved (caught by tranquilliser-dart-guns), when populations are faced with imminent extinction. The project has to be coordinated by an expert on wildlife translocation, with adequate knowledge of primates, preferably a veterinary surgeon, in collaboration with a wildlife/conservation expert/official of the country concerned. It should be initiated by primatologists with the relevant data, and by wildlife/forestry authorities with control over the appropriate land.

Translocations have been more successful for bird and mammal game species (86%) than for endangered species (46%). For primates, translocations of rhesus macaques in India and olive baboons in Kenya have been successful.

David Chivers

While recognizing that the translocation of gorillas is a tempting option, I believe that this can only be considered as a last resort – that is, when there is no alternative for a given gorilla population.

Different criteria may apply to the lowland gorillas and the mountain gorilla (I am using current conventional taxonomic terminology for the different subspecies – I realize that things may change!). In the case of the lowland gorillas, translocation of a small group of animals might be acceptable if their habitat is clearly doomed and there is an apparently satisfactory place to which these animals can be translocated. In the case of the mountain gorilla, however – bearing in mind its localized distribution and small numbers – the dangers are substantially greater: the whole subspecies (*Gorilla gorilla beringei*) could be put at risk if the translocation proved unsuccessful.

The reasons for my cautious approach to this subject are as follows:

- Translocation always involves risks to the animals, regardless of whether they are translocated using physical or chemical restraint.
- Movement of gorillas to another location could result in either a) spread of infectious agents (pathogens) from the translocated gorillas into a new environment – and thus possibly to animals of various species that are already present in that environment – or b) the translocated gorillas may encounter and themselves contract infectious diseases en route to, or in, their new habitat.
- We still know little about the habitat and nutritional needs of gorillas; translocation to some localities might prove disastrous.
- Translocation probably implies abandoning an existing habitat and this could be bad psychologically, politically and environmentally. Certainly in the case of the mountain gorilla (and probably also in the case of many populations of the lowland gorilla), time, money and effort would be better spent protecting the existing habitat and groups of gorillas, especially where there is some conservation/tourism infrastructure, rather than moving the animals and in so doing exposing them to risks and probably attracting local and international criticism.

John E. Cooper

As a conservation strategy, the translocation of wild animals is usually a last resort because of the tremendous problems involved. Translocation of wild gorillas from one forest region to another would be logistically difficult, massively expensive, and could easily go wrong. The dangers include:

- trauma to the animals who are captured and moved, with the death of some of the gorillas being likely,
- the possible introduction of pathogens to the new area,
- failure of the re-introduced animals to adapt to the new environs,
- cross-breeding of potentially separate sub-species.

Furthermore, without careful and extensive public awareness campaigns, a translocation project could send the wrong message to local communities, seriously undermining the credibility of the conservation message and of conservation personnel.

Translocation has potential benefits, such as preventing deleterious inbreeding by introducing "new blood", or saving the lives of gorillas who are doomed to slaughter if they remain where they are. What is good for a handful of individuals, however, is not necessarily good for the species as a whole. We do not feel that the potential benefits would outweigh the risks of translocation in most cases, especially if this expensive endeavor draws money and resources away from other conservation efforts in regions with viable gorilla populations.

Kelly Stewart and Sandy Harcourt