



Gorilla Journal

Journal of Berggorilla & Regenwald Direkthilfe

No. 34, June 2007



**Killing of Two
Silverbacks in the
Virunga Park**

**The Gorilla Popu-
lation in Bwindi
Continues to
Increase**

**Population Struc-
ture in Cross
River Gorillas**

**The Rules and the
Reality of Moun-
tain Gorilla Track-
ing**



BERGGORILLA & REGENWALD DIREKTHILFE

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Cover: The silverback Salama, Virunga National Park, who died in 1995

Photo: Christian Kaiser

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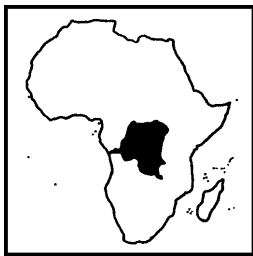
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D. R. CONGO

News from Kahuzi-Biega

Over the last 6 months, the situation in the high-altitude sector of the park has calmed down, and work is progressing normally. In contrast, although some surveillance units have been deployed, implementation of activities in the low-altitude sector of the park remains difficult due to the presence of armed bands of foreign troops (Hutu from Rwanda).

The combination of calm and the support of our partners has meant that we have been able to implement protection measures in the park, in addition to development measures in the accessible areas surrounding the park.

Of the 168 gorillas counted in the high-altitude sector during the last census, we regularly follow 109. These 109 gorillas are grouped into 9 families, of which two are habituated to the presence of people (the Mankoto group and the Chimanuka group). The Chimanuka group is the largest group found to date with 30 individuals. Mugaruka can also be visited, but he is a lone male at the moment.

As mentioned above, development activities have been implemented with the help of our partners. The most recent support received from *Berggorilla & Regenwald Direkthilfe* has helped to reinforce people's trust in the park in the Nindja sector, more precisely at Ihembe.



The renovated house of the Mwami in Mudaka

Photo: Carlos Schuler

Until recently, not a single park representative had put in an appearance at Ihembe since 1996. The collaboration between park and the Ihembe population was interrupted when the population came under the influence of farmers who had illegally invaded the Kahuzi-Biega National Park; they then refused to participate in any development activity initiated by the park. The Nindja population was subsequently traumatized by war atrocities, and in 2005 received over 350 tonnes of food aid. Since then, we have been able to gradually re-establish a dialogue with these people. The re-establishment of contact has allowed us to evaluate the population's real and urgent development needs. The *Berggorilla & Regenwald Direkthilfe's* most recent support arrived at its destination and, by general consensus of the people, was used immediately in the reconstruction of some infrastructure, i.e. the rehabilitation of 6 classrooms each at Kabona and Murhume primary schools, including benches and blackboards, the construction of the Mudaka health centre, and the rehabilitation of the Mwami's house (which will serve as a meeting place for the preparation of the participatory management structure that is envisaged for the future).

These activities have helped to re-establish the collaboration between the park and the Ihembe population that had been interrupted for so long. Nowadays, park representatives can arrive in Ihembe and implement activities without having to worry about their personal safety. The population, who used to have to walk 22 km in order to reach a health centre, now needs to walk only half a kilometre to find health care. The children who used to study sitting on tree trunks between dilapidated walls now listen to lessons while seated on benches in comfortable buildings.

This is a start, but it needs to be followed up. Funds need to be found to reinforce development activities, on

the one hand, and to establish a local Committee for Community Conservation on the other.

The 200 Pygmy children, whose schooling *Berggorilla & Regenwald Direkthilfe* supports, continue to make progress. Their parents and they themselves remain grateful for the support received, which consists of the payment of school running costs and equipment.

On a joyful occasion on March 15th, park staff were able to welcome back the guard who had been held hostage for two years by the "106" splinter group of the FARDC (Armed Forces of the Democratic Republic of the Congo), who had spread terror throughout the park. Not only did they let our guard go, but they also left the park and gave themselves up to the FARDC authorities. If the other armed bands were also to leave the park in such a way, it would make it possible for the park to recover its integrity and to work with the population in its surrounding areas for sustainable conservation and development.

Radar Birhashirwa Nishuli

Cases of Twin Births in Three Gorilla Groups in Kahuzi-Biega

The gorilla subspecies *Gorilla beringei graueri* is endemic to the eastern Democratic Republic of the Congo, including the Kahuzi-Biega National Park, the Maiko National Park and the Itombwe Forest. In the early 1970s, two gorilla groups were tracked daily in the Kahuzi-Biega National Park for tourism, those of Casimir and Mushamuka, and tracking of gorilla groups has continued, whenever possible, since then. The genealogies of individuals from these groups have been documented. Trackers and guides as well as a few researchers had the opportunity to witness many different occurrences in the course of this daily tracking.



D. R. CONGO

Amongst many births recorded, twins births were witnessed in the gorilla groups Maheshe, Mufanzala and Chimankuka over the three decades of the park's existence. Two sets of twins were born, to two different females, in the group led by the silverback Chimankuka, and two other sets were born in the groups Maheshe and Mufanzala (see also Iyomi & Schuler 2005).

The Maheshe Group

The late Maheshe (1960–1993), the son of Casimir (1924?–1975), had led a few members of his father's group since the late 1970s and early 1980s. In his group, many single babies were born and recorded, with more females than males. It was in Maheshe's group that the first case of twins was recorded. As nearly all the daily activities by the gorillas in the tourist sector (Mt. Bugulumiza and surroundings) were recorded by us, many copulations between the silverback Maheshe and one known female were witnessed in the period of mid-June 1988; they ceased toward the end of the year.

In July 1989, during an episode of *Myrianthus holstii* fruit harvesting by the gorillas, we witnessed the female carrying twin babies aged two days. They were carried ventrally by their mother, one on each side, and suckled from one breast each. The sex of the babies was discovered when the mother moved each of them once to collect food, or in grooming them during the siesta. They were both males.

When we named the twins, this meant also that the mother would be named. As is the custom in the Bushi territory in which the Bugulumiza mountain is located, a twin mother is called Mo-twi ("mother of twins") automatically; the twin which suckled at the right breast was called Jumaa and the twin which suckled the left breast was named Posho (both names indicate a week of the month), as they were born in the beginning of July.

The suckling and the health state of both twins was good and Mo-twi, the mother, took good care of them including their social integration in the family. Maheshe seemed to be very tolerant towards Mo-twi, and she appeared to be the top-ranking female of the group; it was she who was allowed to sit next to Maheshe, and she was seen most of the time grooming his hair during the siesta period. She always travelled next to him. If there was favourite food, like the wild banana tree *Ensete ventricosum*, we observed Maheshe eat first and Mo-twi next, before any other individuals of the group were allowed to eat.

Death of the Father, the Mother and the Twins...

According to our daily long-term observations, none of these four individuals, or any of the other members of the group, died naturally. Posho was squashed by the silverback Nindja during an interaction between him and Maheshe in September 1989, two months after his birth. Mo-twi was involved in the fight, trying to help Maheshe while carrying the twins ventrally, and unfortunately Posho received a trauma and was sick for a few days before he died. We observed the mother carrying both babies, the dead Posho and the living Jumaa. During the displacement of the group, Jumaa was carried on the chest and Posho in the hand of the mother. Mo-twi was mostly upright, and during feeding, she always placed the dead twin on the ground and fed with one hand until the group left; she would do this until Posho's body decomposed.

Maheshe himself was slaughtered and his head cut off by Pygmies to sell as a trophy on November 3rd, 1993 (Kahekwa 2005). Mo-twi, who later was renamed Mugoli (queen), took over leadership of Maheshe's group for over 8 months; it was the first time, in our experience, or to our knowledge, that a

female had led a group after the death of the leading male.

During the war that has raged in the Great Lakes region since 1990, when tourism in Kahuzi-Biega National Park was suspended, the new male Lambchop from the Mushamuka family took over this group. Mo-twi copulated with Lambchop many times and had a new baby called Lwasi (leaf) in 1995. Lambchop, a son of Mushamuka, was then renamed and called Maheshe 2 by the authorities. This custom of changing the names can be confusing for anyone trying to track the data and origin of the individuals.

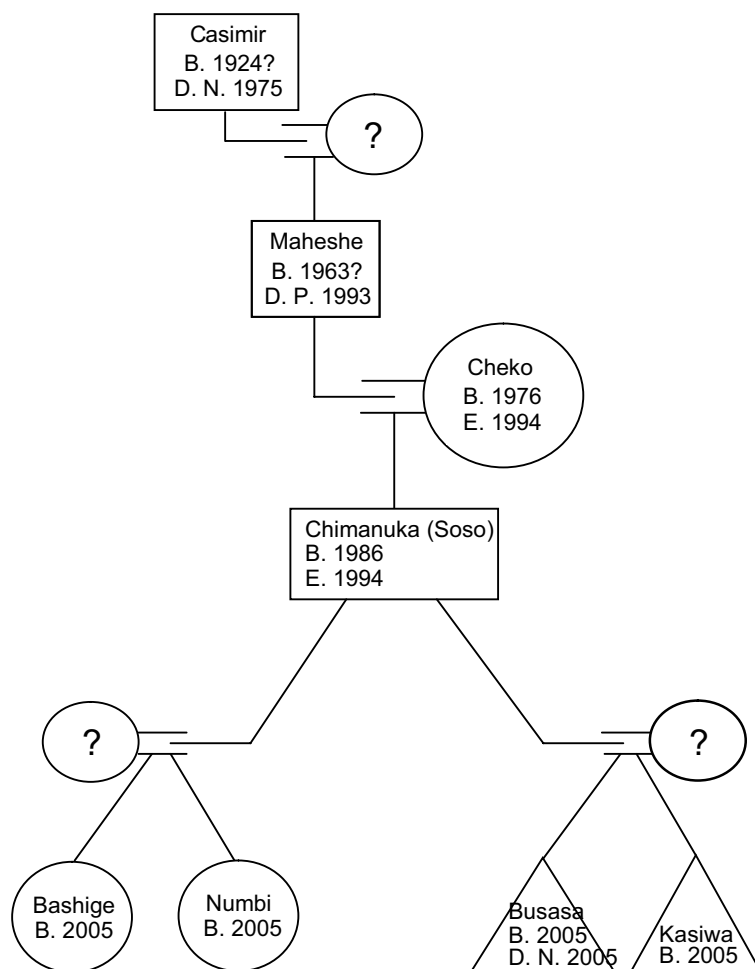
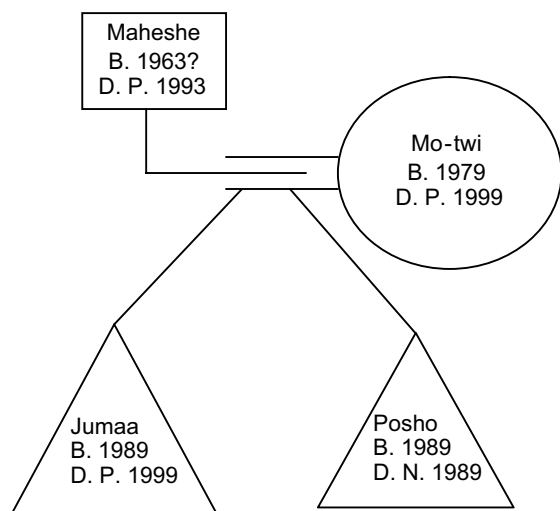
It was only after September 1999 that we were able to search for Lambchop's group in its territory, and missed all the members. We concluded that many of them were victims of slaughtering for bushmeat, because we came across three different campfires and found gorilla skulls and hair thrown around. Thus, Lambchop, Mo-twi, Jumaa and other members were consumed for their meat. At that time we found hardly any fresh gorilla nests or fresh paths.

Second Twin Birth: Mufanzala Group

During this period of intense human pressure on the natural resources of the Kahuzi-Biega National Park, which caused the death of almost half of the gorillas in the highland sector and the encroachment of their habitat in 1997 to 1999 (Kahekwa 2005), the gorilla groups habituated to human presence were much more vulnerable than the unhabituated groups. The Mubalala (traveller) group and other groups were slaughtered for bushmeat and possibly for live babies. Only very few members of this group escaped and moved for some time within their area until a wild silverback moved in; this new silverback was finally joined by the few surviving members and the new group occupied the area of the late Mubalala group.



D. R. CONGO



□ = Silverback
 ○ = Adult Female
 △ = Twins
 — = Copulation with
 / \ = Birth of twins
 B: Born
 D. N.: Died Naturally
 D. P.: Died by Poachers

E.: Emigration

○ ? = Female without name

The lines of the twins in the Maheshe family

This silverback was not easy to approach; he charged us from a distance and ran away every time. Only two of the rescued group members glanced at us occasionally. The trackers named the wild silverback Mufanzala (a hungry person); this was the name of a gorilla tracker who had worked in the PNKB since the early 1970s.

Gorillas who had lost their family structures were scattered everywhere, seeking other males or females for

building up new groups. The silverback Mufanzala integrated several females and formed his own group, which was monitored every day, and at the end of 1999/beginning of 2000 the trackers and ourselves discovered a twin birth in this group; the twins, who were already almost 6 months old, were carried by a female used to people. She carried the twins ventrally and we only had a chance to see them briefly once or twice a month as the silverback would

The genealogy of the two twin sets from Casimir, their grand-grandfather

not tolerate our presence and usually led his group to hide from us when we would come. As a result, the sex of the twins remained unknown to us. Both twins are still alive and are now juvenile.

The discovery of the twins increased the count of the Mufanzala family from 12 to 14 members: 1 silverback, 8 adult females, 3 subadults, 2 infants. The absence of blackbacks and juveniles was remarkable.



D. R. CONGO

December 30, 2003	?	
February 15, 2004	?	
June 19, 2004	?	
February 21, 2005	?	Twins (Bashige & Numbi)
March 15, 2005	?	
April 29, 2005	males	Twins (Busasa & Kasiwa)
June 21, 2005	?	

Other Births in the Chimanuka Group

Two Sets of Twins in the Chimanuka Group

The now famous silverback Chimanuka is a son of the late Maheshe and a grandson of Casimir, the first silverback whose family was visited by tourists in the early 1970s. Chimanuka was born in Maheshe's group in 1986 to a female called Cheko. His infant name was Soso (chicken in the Lingala language). He grew up in this family to maturity; as Maheshe did not tolerate the presence of his sons when they tried to mate with the females in the group, Chimanuka was forced to emigrate at the age of 8 years and to live a single life for years. It was remarkable that the males who had been chased from their paternal group did not move far away to establish their own home ranges; Chimanuka travelled in the surroundings of his father Maheshe's area. We found his paths and nests when we visited the groups Maheshe and Mushamuka.

For a long time after the slaughtering of many gorilla families for bushmeat (Kahekwa 2005), there were no gorilla groups habituated to people in the Mt. Bugulumiza sector. Finally we encountered narrow paths and two gorilla nests in the sector which formerly had been occupied by Casimir, Maheshe, Mushamuka and Nindja.

From September to October 2002, the first interactions between Chimanuka (Soso) and Mugaruka (Kaboko) occurred in the bamboo forest where the gorillas were consuming the new shoots. A few females transferred from Mugaruka to Chimanuka.

At the end of December 2002/beginning of January 2003, Chimanuka and Muhindo had their first offspring called Bonane (happy new year).

Chimanuka was responsible for the first recorded cases of infanticide in the Kahuzi-Biega National Park, although the gorillas had been observed for over 30 years (Yamagiwa & Kahekwa 2004). He killed 3 babies of different females who had transferred to him from Mugaruka's group. All the infants were males that were carried by their mothers.

Chimanuka took over Mugaruka's group and home range – almost 90% of the females and 90% of the area that Mugaruka had occupied. Matings between Chimanuka and the females that had transferred from Mugaruka were observed. From 2003 to 2005 7 births including 2 sets of twins occurred in this group. The two twin sets were delivered by two different females.

Other Births in the Chimanuka Group

After the transfers of most individuals from the Mugaruka group to the Chimanuka group, guides and trackers were not able to identify which females were mothers of twins or mothers of single babies. After multiple interactions between Chimanuka and other units as well as new births, the group increased to 26 members between 2003 and 2005. In 2005, the Chimanuka family consisted of 1 silverback, 15 adult females and 10 youngsters.

John Kahekwa

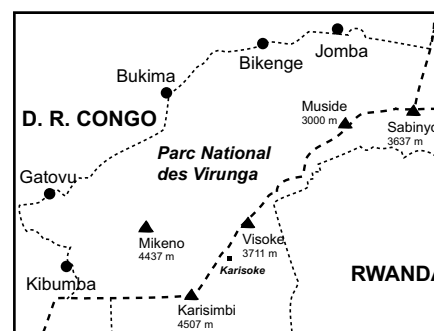
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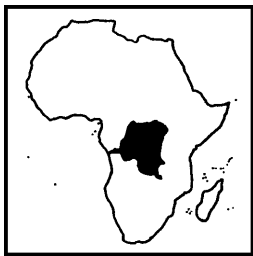
The Killing of Two Silverbacks by Rebel Forces in the Virunga National Park

9th January 2007

Paulin Ngobobo, the Chief Warden of the Congolese Institute for the Conservation of Nature (ICCN) responsible for Virunga's gorilla sector, received information that a male silverback had been shot and killed by Congolese rebels less than 600 m east of the patrol post at Bikenge. A farmer who had been working in a nearby field had been asked by the rebels to identify the animal and tell them whether or not it could be eaten. The farmer saw the dead silverback and told them that it was dangerous to eat. The farmer then informed members of the local association HuGo, established to deal with human-gorilla conflicts, who in turn reported the incident to the station of Rumangabo.



The Mikeno Sector in the Virunga National Park with ranger posts



D. R. CONGO

10th January 2007

A press release was put together by *WildlifeDirect*, FZS (*Frankfurt Zoological Society*), G4G (*Gearing up 4 Gorillas*) and GRASP and circulated throughout the international media.

11th January 2007

The ICCN and FZS visited the MONUC headquarters in Goma and made contact initially with the Civil and Military Coordination Officer. Robert Muir, FZS Project Leader, explained that a UN escort was needed into an area of the park currently occupied by Laurent Nkunda's rebel forces in order to investigate the supposed killing of a silverback mountain gorilla. He pointed us in the direction of the UN meeting hall where they were currently discussing and programming UN escorts for the following week. We joined the meeting and requested an escort on Monday 15th which was the earliest date that the UN could make one available. Despite the peculiar nature of our request, it was nonetheless met with understanding and agreement, and we were told to report to the Commander of MONUC's battalion at Rutshuru at 07.30 on the morning of the 15th.

15th January 2007

The FZS team and a journalist from MONUC's "Radio Okapi" spent Sunday night at Rumangabo station with Ngobobo and 6 park rangers. Leaving the station at 06.00, we arrived at Rutshuru about 40 minutes later where we met Colonel Schmidt who welcomed us into his command centre. He asked us about our mission and then asked his translator to call the rebel commander Major Mboneza on the phone. He explained to the major that MONUC wanted to come in for two reasons. Firstly to repair the water system they had destroyed during the recent clashes with the FARDC, and secondly to accompany a group of conservationists who wanted to locate



MONUC Officer, Robert Muir, Paulin Ngobobo

the dead mountain gorilla. The reply was clear and unequivocal. MONUC could come to fix the water system, but under no circumstances were the conservationists allowed to enter their territory to find the gorilla. We tried impressing on MONUC the importance of the mission and they tried again to call the Major to persuade him to reconsider, but he stood fast and said no, and that he would refer the problem to his superior (General Laurent Nkunda). We asked MONUC to follow this up and keep us posted, telling them that this was a top conservation priority of international importance and that we needed access within the next 24–48 hours.

Later, upon returning to Rumangabo, we learned that one of the gorilla trackers at Bikenge had come across a second body that had been recently shot and gutted about 200 m west of the patrol post. The intestines were lying beside the wild banana plant that the gorilla had been feeding on, and the remains of its body including its head had been discarded down a pit latrine. It was clear that our first wave of lobbying had not worked, in that not enough pressure had been put on Nkunda to take responsibility for the death of the first gorilla and to make sure that it did not happen again. Just in case access with MONUC would prove unworkable, we decided to develop a contingency

plan. Ngobobo instructed two of his trackers to return to the drop pit and provide him with evidence of what they had seen. FZS provided a small digital camera and asked them to take photos of the body and the toilet in which the mountain gorilla remains had been dumped. They were to leave at first light the following day and were expected to be back by nightfall.

Returning to Goma, FZS received a phone call from the MONUC commanding officer informing us that we had authorization to go to Bikenge the following day under armed escort to try and find the gorilla bodies.

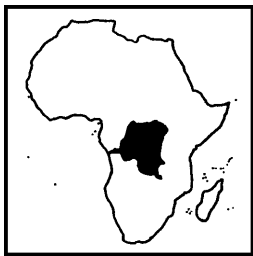
16th January 2006

At 05.30 we set off from Goma and reached the Rutshuru Battalion by 07.30. There was an escort of two vehicles waiting for us, and we were instructed to follow the first vehicle, heading for Rumangabo FARDC Commando Camp, where we were told we would pick up a military escort. This puzzled us because unlike MONUC, the FARDC had no access to the rebel area. Indeed their presence would only provoke an immediate attack on them, us and MONUC. However, we were told by the UN that this is what was going to be done, and when we pressed them further saying that we would not get into the target area with FARDC soldiers, we were told that we would go as far as we could, and if



MONUC lead vehicle

Photo: Robert Muir



D. R. CONGO

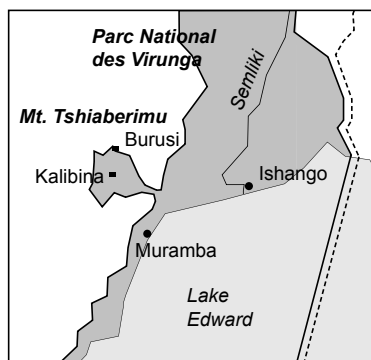
Ranger Posts Attacked and Rangers Killed, Wounded

Mai-Mai rebels attacked the ranger posts at Burusi and Kalibina, Mt. Tshiaberimu, on 20th May 2007. They shot and killed Nicolas Mbusa Viranzire, 34 years old, who worked for the WWF program PEVI, and injured three other men; the pregnant wife of one of the rangers had a shock miscarriage and died later. The population was forced to flee, and hostages were taken by the rebels and released later.

The reason for the attacks was that the rebels wanted to plunder equipment. The Mai-Mai, who are still based in Muramba, at the shore of Lake Edward (illegally – within the park), are the ones who were responsible for the slaughter of hippos in the Virunga National Park.

As the rebels had threatened to kill all Mt. Tshiaberimu gorillas, the rangers searched for them during the days after the attack, and they found all the 21 individuals alive and well.

Summary of information provided by Ephrem Balole and the blogs at www.wildlifedirect.org



they started shooting at us, we would turn back.

We met the FARDC Colonel at the Commando Camp and it turned out that he and Ngobobo were good friends and had played in the same football team when they were young, but had not seen each other for more than 10 years. Ngobobo explained the nature of the mission to Col. Yav and what we hoped to achieve. This was followed by a rather interesting and somewhat worrying exchange of radio messages as the Colonel tried to establish the exact limits of the area under his control. After 15 minutes of talking to his various military posts, he declared that the patrol post was under rebel control and he could therefore not guarantee our security. However he did agree to provide us with a section of men under the command of a Sergeant Major known as “Cobra 1”, and told us that they would accompany us to the very last military position before reaching rebel territory. After that, we were on our own. We asked our MONUC escort whether they could contact the rebels and notify them that we were coming. They said that they would do so, and sent a message back to the MONUC Battalion at Rutshuru requesting that they contact the rebel group to allow the patrol to gain access.

We arrived at the last military checkpoint having driven through a number of recently abandoned villages. We off-loaded Cobra 1 and his section and then continued down a small track that led down to a valley between two hills. The hill on the right was under FARDC control, the one of the left was under rebel control. At this point we carried out a radio check with MONUC Rutshuru and discovered that they had not yet been able to make contact with the Major. Apparently his phone was ringing but he was not picking it up. We decided to continue and see how far we could get. Once down in the valley we started crossing “no-man’s-land” to-



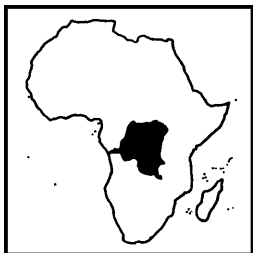
MONUC patrol fanning out

Photo: Robert Muir

wards the park, the patrol post, and the rebel position. We got to within 500 m of the patrol post. We could see a rebel camp a few hundred meters away on top of a small hill to the left, the site where the first silverback had reportedly been killed. To the right was a small tree line which marked the location of the drop latrine and the remains of the second gorilla.

There was a local villager nearby and we stopped the vehicles and got out. While Ngobobo questioned him, the MONUC soldiers surveyed the area. The message came through on the radio that the MONUC Battalion still had not managed to make contact with the rebel troops. A couple of minutes later two of the MONUC soldiers saw a number of rebels approaching us from both left and right, and we decided it was time to make a hasty retreat. Back in FARDC controlled territory we left the MONUC patrol, asking them to continue their efforts to try and make contact with the rebels, and to let us know once they had confirmation that we could go into the area.

On the drive back, Ngobobo told us that according to the local farmer, the ICCN trackers had arrived early that morning and found the gorilla still in the pit latrine and had returned to the station with the head of the gorilla. The contingency plan had worked and we were relieved that there was now some



D. R. CONGO

Appeal: Support the Congo Rangers

The rangers of the Virunga National Park are courageous and dedicated, but they can only patrol the area regularly and save the gorillas from poaching if they are sufficiently well equipped.

Here are things that they need urgently in the Mikeno Sector:

- uniforms and other clothes
- a motorcycle
- GPS devices, binoculars
- tents, backpacks, sleeping bags, mattresses
- rations for patrols

We want to do all we can to support the rangers. They deserve our full support. Please help us to provide them with the equipment they need.

We are cooperating with the IGCP, who will help us to purchase the material and distribute it directly to those who need it.

Our partners working for the IGCP:



Maryke Gray (left) wrote a proposal for us, listing the needs of the park for the conservation of the gorillas.



Dr. Augustin Basabose (right) represents the IGCP in Goma, Democratic Republic of the Congo.

Bank Account:

Account number 353 344 315
Stadtsparkasse Muelheim/Ruhr
Germany
Bank code number 362 500 00
IBAN DE06 3625 0000 0353 3443 15
SWIFT-BIC SPMHDE3E

Address for cheques:

Berggorilla & Regenwald Direkt-hilfe
c/o Rolf Brunner
Lerchenstr. 5
45473 Muelheim, Germany



Virunga National Park rangers with uniforms and sweaters donated by B&RD before the attack on the ranger post and looting in December 2006

tangible evidence to support such serious claims of mountain gorilla killings. Worryingly, the farmer had also informed Ngobobo that shortly after the ICCN trackers had left, two rebel soldiers passed through the village asking for their whereabouts.

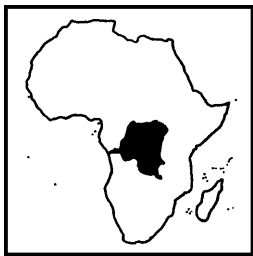
Back at the station we debriefed the trackers, examined the head, and identified the individual as Karema, an 18-year-old solitary silverback.

- Name: **Karema**
- Family: Solitary
- Age class: Silverback
- Meaning of the name "Karema": Handicapped
- Identifying marks: Left hand amputated
- Lineage: Father Rugendo, mother Mukechuru (died of old age in 1991)
- Behaviour: Calm
- Personal History: Born in 1989, orphaned by his mother in 1991
- Habituation in June 1991 (Conrad Aveling)
- Disappeared from his family in February 2002, recovered in March 2002

Became a blackback in March 2002
Became solitary in July 2002
Killed on the 11th January 2007 at the age of 18



Karema when younger



D. R. CONGO

17th January 2006

FZS was called at 06.00 by MONUC and told that they had managed to get a line through to the rebels the previous evening and that we had now been granted official access to the area, and we left at 08.00 for MONUC Rutshuru. From Rutshuru we took the road to Jomba with three UN vehicles escorting us. We again drove through the deserted villages and then past Runyoni, a small mountain and temporary home to one of the rebels' larger groups.

We saw hundreds of rebel soldiers silhouetted against the sky looking down on our convoy as we drove past. We then took the small track which led through the valley and towards the patrol post. Arriving at the patrol post it was clear that it had only recently been deserted. There was a stake that had been freshly spliced that morning and a small calf that had been shut in one of the rooms.

We then walked from the patrol post to the drop latrine, which was just meters away from the wild banana plant from which Karema had been feeding when he was shot. Inside the latrine we saw the butchered gorilla body, and then outside we found the skin from his back, the hair still silver-grey.

A message then came over MONUC's radio informing us that the Head of the Indian Battalion, Col. Ashok, was also on a mission in the area and wanted to meet us. We headed back up the track where we found three more patrol vehicles waiting for us. The Colonel asked us how MONUC could help and Ngobobo asked him whether MONUC could help organize a meeting with the rebels so that we could get them to recognize the neutrality of the park staff and the importance of allowing the rangers to work in safety. The Colonel agreed. The Colonel also asked whether ICCN would be interested in carrying out mixed patrols into the gorilla habitat to check on the status of the habit-



Robert Muir cleaning and inspecting the gorilla head. There was a bullet wound to the left eye

uated groups. Ngobobo accepted the kind offer.

With the rebels still occupying the gorilla habitat there was real concern that more gorillas may be at risk and something needed to be done to bring the situation under international scrutiny. When rebel soldiers kill a mountain gorilla, an endangered species of such critical importance, there are global repercussions, and the attention of people around the world would focus on them.

WildlifeDirect immediately launched an international media campaign which had seismic effects on an unprecedented scale and immediate pressure was brought to bear on the rebel troops. Ngobobo was contacted several times by General Laurent Nkunda requesting that they meet, and on the 23rd January a meeting was held between the rebels (represented by Nkunda's Operational Commander, Colonel Makenga), ICCN and FZS, and was mediated by the UN. Makenga refused to accept responsibility for the killing of the gorillas and Ngobobo made it clear that he had not come to lay blame, but to impress upon him the enormous importance of the mountain gorillas and that, while they are occupying the gorilla habitat, they have de facto responsibility for them. Makenga gave his assurances that no further mountain go-

rillas would be killed. To date, 4 gorillas are still missing.

Robert Muir and Paulin Ngobobo

The Animal Welfare Institute (AWI), selected Paulin Ngobobo as one of the recipients of the 2007 Clark R. Bavin Law Enforcement Awards. These awards are given to worthy individuals for outstanding achievements in wildlife protection and were presented at the June CITES meeting at The Hague in the Netherlands. Congratulations!

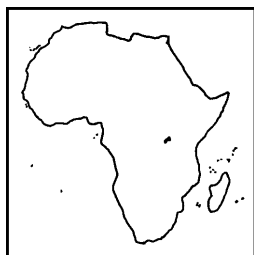
Mountain Gorilla Mother Killed

Rubiga, a female mountain gorilla from the Kabirizi group in Virunga National Park, was killed with two bullets on June 8th. She was shot in the back of the head, execution-style, and in the right arm. Her 2-month-old baby (born 15th April, 2007) was clinging to her breast when rangers found Rubiga, 18 hours after her death.

The baby, who was named Ndakasi after a recently deceased ranger, was in a critical condition, and was examined and treated by the *Mountain Gorilla Veterinary Project*.

The Kabirizi group fled and was not found by the rangers until June 12th, when 24 of the remaining 32 group members were recontacted. The group was traumatized and could not be approached closely.

Summarized from the blog of Paulin Ngobobo (regularly updated). For further information see: www.wildlifedirect.org/gorillaprotection



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Rehabilitating Confiscated Eastern Gorillas

Since November 2003, a total of 8 infant gorillas have been confiscated in the region of eastern Democratic Republic of the Congo and western Rwanda, 2 of them mountain gorillas and 6 Grauer's gorillas, demonstrating a growing concern over live gorilla trafficking in the area. Up until recently these gorillas had been cared for separately on an "ad hoc" basis as there was no facility in the region that was geared up for these orphans.

So in 2006 a joint project was launched involving the *Mountain Gorilla Veterinary Project* (MGVP), the *Dian Fossey Gorilla Fund International* (DFGF-I), the *Office Rwandais du Tourisme et des Parcs Nationaux* (OR-TPN) and the *Institut Congolais pour la Conservation de la Nature* (ICCN) to provide at least a temporary solution to this problem. Utilizing grants from Busch Gardens and the *US Fish & Wildlife Service*, a facility was constructed near the Kinigi headquarters of the Parc National des Volcans in Rwanda. The idea behind this was the rehabilitation and eventual reintroduction of Maisha, a female mountain gorilla confiscated at around 3 years old in December 2004. As all previous attempts to introduce infant gorillas to unrelated wild groups had failed, it was decided to try a different approach this time, based on our knowledge of wild gorilla behaviour gained through 40 years of research at Karisoke. This knowledge told us that it was far from normal for an infant to transfer into an unrelated group but that a female approaching breeding age (7–8 years) is far more likely to be accepted.

This left us with several issues to be dealt with. Firstly, the logistical problems of caring for a gorilla for a long period of time, and secondly, the behavioural issues of preventing Maisha from becoming overly humanized. This

is where the idea of the Confiscated Gorilla Interim Quarantine Facility was first conceptualized. In constructing a single facility we were able to both cater to the social needs of the gorillas by mixing them as single group and minimize the logistical aspect of their care (the gorillas were previously held in 4 different locations).

The first 3 gorillas were introduced in the facility in September 2006: Maisha (female mountain gorilla, around 4–5 years at the time), Ntabwoba (male Grauer's gorilla, also between 4 and 5 years) and Dunia (female Grauer's, between 1 and 2 years), all animals that had been confiscated in Rwanda. Their introduction was a long and difficult process as the 2 older animals had not seen another gorilla for a long time, were unable to understand each other, and often failed to read the others' cues. After 2 weeks of intensive supervised sessions, however, they had their first play bout. Since this time their relationship has strengthened and

they have become inseparable, especially with the addition of Dunia, who became the focus of much attention as the smallest of the group.

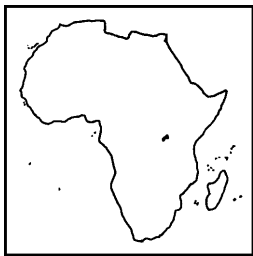
In November 2006 we were given CITES permission to bring 4 Grauer's gorillas, which were cared for at the DFGF-I office in Goma, Congo, into Rwanda so that we could socialize all of the gorillas together. After a period of quarantine, a soft introduction process was begun with all of the animals allowed limited contact through a chain-link fence. The initial meeting was made up of the usual strutting and pursed lips but curiosity soon got the better of all involved and they were soon touching and sniffing each other through the fence. From the first day, all animals remained in proximity, separated by the fence, for the majority of the time and, after a month, it was decided that they were ready to meet for real.

This introduction went remarkably smoothly, with only minimal bickering during feeding times. It has been an in-



The new enclosure

Photo: Simon Childs © DFGF-I 2007



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The orphan group in the enclosure

Photo: Simon Childs © DFGF-I 2007

Interesting experience watching the animals grow together as a group, seeing both relationships and behaviour change as they habituate to each other and develop as the social animals that they are intended to be.

Maisha, particularly, has demonstrated a savvy political astuteness in her dealings with the gorillas that came from Goma and who were already bonded. Her previously domineering personality has softened and she knows when to back down to the coalition, even though she is larger than them as individuals. This bodes well for the future introduction, as a wild silverback will not tolerate overconfidence from a young female, and would likely meet it with aggressive discipline. We will carry on watching and collecting observational data as the group continues to develop socially.

In March 2007 there was a new addition to the group. Kaboko, as he has since been named, was confiscated from Congolese poachers in Gisenyi, Rwanda, and was suffering from a severe injury to his right wrist, probably caused by a snare. Although not con-

firmed by genetics as yet, Kaboko appears to be a mountain gorilla of around 3 years of age. The presence of the snare injury suggests that this is an opportunistic incident rather than a resurgence in mountain gorilla poaching. Kaboko has been in quarantine since his confiscation (each gorilla is subject to this process, whereby samples are taken for analysis and TB testing is carried out before they are placed anywhere near the others) and is currently enjoying the same soft introduction process as previously mentioned; it is hoped that he can be fully integrated into the group within the next month.

Obviously the next step will be the reintroduction of Maisha to the wild population, the logistics and methodology of which will be decided upon by the Scientific Technical Steering Committee that was set up upon her confiscation and involves all conservation partners in the region. At the same time, we must begin to look for a permanent solution for the future of the rest of the orphan group, which will be located within their range state of Congo. This will require a great deal of

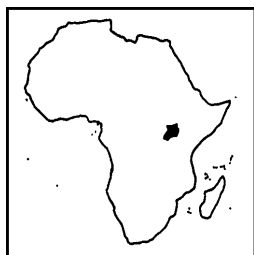
planning and effort on the part of all involved; as with any new project, there will be many pitfalls to navigate, especially in a region with so many security and development issues.

Combating the Trade

This leaves us with the difficult task of combating and reducing the trafficking in wild gorillas in the region. As previously stated, local authorities have managed to confiscate 8 gorillas within the last 4 years, all of which are believed to have originated in the Democratic Republic of the Congo. This is likely to just be the tip of the iceberg as there have been many rumours of more gorillas being captured and held, the majority of which probably die under the poor conditions provided by the poachers before the authorities are able to get to them. It is likely that for each Grauer's gorilla confiscated, there is at least one that is missed. When you add this to the number of gorillas that are killed in each poaching incident, this shows that a devastating toll is being taken on this, probably the least well protected of the gorilla subspecies.

In order to begin tackling this issue, DFGF-I has recently acquired funding for a new project specifically targeted at this problem. Based in Goma, the project will combine educational and sensitization programmes with reinforcing links with local authorities and gaining support in local communities, and in addition we will develop an intelligence network aimed at disrupting and deterring both the traffickers and the poachers involved. This is a new project that will utilize the local knowledge and excellent community relations already established by DFGF-I's Landscape Graueri Program. The hope is that we can discourage the trade through both working at the grassroots level with the communities involved and aiding law enforcement in the region.

Simon Childs



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The Gorilla Population of Bwindi Continues to Increase

Periodic censuses of endangered populations of high-profile species help us to understand their population dynamics, to assess the success of conservation programmes aimed at ensuring their survival, and to ensure that they receive continued attention from the global conservation community. Mountain gorillas (*Gorilla beringei beringei*) are highly endangered, with just two small populations in Bwindi Impenetrable National Park in southwestern Uganda and the nearby Virunga Volcanoes on the borders with Rwanda and the Democratic Republic of the Congo. A survey of the Bwindi population was carried out in 2002, and results showed that the population had increased since the previous census in 1997 by approximately 7%, to 320 individuals (McNeilage et al. 2006). The Virunga population currently numbers around 380 gorillas (Gray et al. 2006). A new census of the Bwindi gorilla population was carried out between April and June 2006 to determine the population's total size and structure, its distribution across Bwindi, and the potential impact of human disturbance on the population.

To estimate the total population size for the gorillas, the park was intensively surveyed by teams with the goal of locating every single gorilla group (see McNeilage et al. 2006 and Gray et al. 2006 for detailed methodology). To ascertain that we were not double-counting groups, and to ensure that we were able to distinguish and identify each group, fecal samples were collected to create genotypes, or unique genetic identifications, of the gorillas in each group. The genetic analysis is being carried out at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.



A member of the Habinyanja group

Photo: Susanne Zeitler

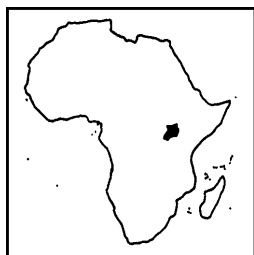
The results show that the 5 habituated groups in Bwindi contained a total of 76 individuals at the time of the census. In addition to these, 25 unhabituated groups were found, containing 227 individuals along with 11 lone silverback males, giving a total uncorrected population count of 314 individuals. As in other censuses of mountain gorillas, we then used a correction factor to account for infants not counted (their dung could not be observed in the nests) and the likelihood of not counting some gorillas, to estimate that the total population size is 340 individuals. The current age composition of the population indicates a healthy distribution of individuals in the adult and immature age classes. Approx. 22% of the gorillas (17% of the groups) are habituated to humans. Further details of the population structure, genetic composition, and the relationship between gorilla distribution, change in population size, and human disturbance will be given in forthcoming publications.

These results indicate a continued steady increase in the population of

mountain gorillas in Bwindi Impenetrable National Park. The increase to 340 gorillas represents a 6% increase in total population size since 2002 and a 12% increase since 1997. Overall the gorilla population has been increasing at an approximately 1% annual growth rate. While research in the Virunga Volcanoes has shown that gorilla populations are capable of growing at a higher rate than this, a 1% annual growth rate over nearly a decade is still indicative of a reasonably healthy and well protected population.

Alastair McNeilage, Martha M. Robbins, Katerina Gushanski, Maryke Gray and Edwin Kagoda

We would like to stress the value of this exercise as a collaborative effort among Uganda Wildlife Authority staff, researchers, and conservationists as well as among participants from Uganda, Rwanda and the Democratic Republic of the Congo. This was the fourth census carried out in Bwindi and the Virungas in the past decade and many participants had also gained training



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and experience through the Ranger Based Monitoring Program. As a result, the level of knowledge, skills and motivation of all participants was very high and helped make this census a success.

The census benefited from the support and participation of the US-AID PRIME West Project, Institute of Tropical Forest Conservation (ITFC), Uganda Wildlife Authority (UWA), Wildlife Conservation Society (WCS), International Gorilla Conservation Programme (IGCP), Max Planck Institute for Evolutionary Anthropology, John D. and Catherine T. MacArthur Foundation, World Wide Fund for Nature (WWF), Berggorilla & Regenwald Di-rekthilfe, Karisoke Research Centre, Office Rwandais de Tourisme et Parc Nationaux (ORTPN) and the Institut Congolais pour la Conservation de la Nature (ICCN). We thank the following people who worked as team leaders: Sarah Sawyer, Nick Parker, Augustin Basabose, James Byamukama, Chrispine Safari, Moses Dhabasadha, Moses Olinga and Emmanuel Tibenda. We also thank the many participants in the census including those from Rwanda, D. R. Congo, and the communities surrounding Bwindi for their extremely hard work and enthusiasm to complete this exercise. Aggrey Rwetsiba of UWA provided valuable comments on a draft of this report.

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The Rules and the Reality of Mountain Gorilla Tracking

The tracking of mountain gorillas (*Gorilla beringei beringei*) generates enough

revenue to cover park management costs and contribute to the national budget of the *Uganda Wildlife Authority* (Archabald & Naughton-Treves 2001). As a result, tourism is generally considered a crucial component of gorilla conservation strategy (Weber 1993; McNeilage 1996). There are however several concerns about the effectiveness of tourism as a conservation tool in this context (Butynski & Kalina 1998), foremost amongst which is the risk of diseases being transmitted to gorillas. An event of this kind could have devastating consequences for this critically endangered species (Homsy 1999; Daszak et al. 2000; IUCN 2006).

While gorillas are perhaps most at risk from catching diseases from park staff, researchers, and local people living in their habitat (Wallis & Lee 1999; Guerrero et al. 2003), tourists also pose a significant threat because (1) there is a high level of exposure to tourists as habituated gorilla groups experience close contacts with a group of tourists every day, (2) they may bring with them novel infections to which the gorillas have no immune response, and (3) it has been found that some tourists visiting chimpanzees in Uganda show symptoms of risk diseases such as diarrhoea, coughing and respiratory distress (Adams et al. 2001). Gorillas can be vulnerable to human gut and skin parasites (Sleeman et al. 2000; Kalema-Zikusoka et al. 2002), but airborne diseases are believed to represent the greatest threat posed by tourists (Homsy 1999).

The degree of health threat posed by tourists depends on a number of factors: whether any tourist is infected with a risk disease, and, if so, the infectiousness and mode of transmission of that disease (Woodford et al. 2002); how close tourists get to the gorillas, as the risk of infection with diseases transmitted by air increases with increasing proximity (Homsy 1999); the number of

tourists in the group and the duration of their visit, as the risk of transmission is linked to exposure to infectious individuals; and the characteristics of the gorillas that come into close contact

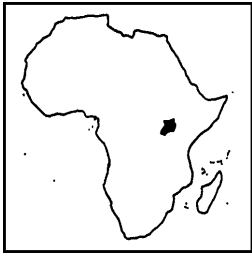
Gorilla Permit Prices

Uganda, Rwanda and the Democratic Republic of the Congo will standardize gorilla permit fees to US\$ 500 for foreign non-residents and US\$ 475 for foreign residents as well as East African nationals as of July 1st, 2007 (nationals of the range countries have to pay much less). Until June, Rwanda and Uganda charged non-residents US\$ 375 and Congo US\$ 335.

It was decided to harmonize fees to take account of the migratory trans-boundary gorillas, such as the Nyakagezi group, which ranges into all three countries; they can be visited by tourists in the particular country where it is staying, and the revenues will be shared between the country of origin (where they were habituated) and the host country. For the Nyakagezi group, a memorandum of understanding was signed between UWA, ORTPN and ICCN.

Moses Mapesa, the director of UWA, said that the standardized pricing will strengthen the collaboration among the three countries. This will be in line with the East African countries' intention of harmonizing their tourism operations. Bookings under the new rates have already started, as permits can be booked up to 2 years in advance.

Summary of information from the Uganda Wildlife Authority
<http://www.uwa.or.ug>



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with humans, as juvenile gorillas are considered more vulnerable to human diseases than adults (Graczyk et al. 2001) and are more curious and likely to approach humans (A. McNeilage, pers. comm.).

Taking these risk factors into account, tourists are expected to abide by a number of rules during their visits to gorillas (for full details of all tracking rules see IGCP 2005). Successfully enforcing gorilla tracking rules is difficult because of gorilla and tourist behaviour, and because guides may allow rules to be broken in pursuit of tips or as a result of accepting bribes (McNeilage 1996; Butynski & Kalina 1998). Infringements of gorilla tracking rules have been widely reported (Aveling 1991; McNeilage 1996), but to date there has been no study that sets out to quantify them systematically. This study from Bwindi meets this need by measuring how close tourists get to gorillas, how these close contacts are initiated, the age class of gorillas with which close contacts occur, and the duration of contacts.

Data were collected between February and December 2004. Tourists attended a *Uganda Wildlife Authority* briefing session in the morning before tracking, at which they were asked if they would be willing to be interviewed. Those accepting were visited for interview in the afternoon following their return from the forest.

In each interview the purpose of the study was explained and the participant taken through a structured questionnaire that provided data regarding their visit to the gorillas. These were how close they got to the gorillas at the point of closest contact, how long this contact lasted, the age category (juvenile or adult) of the gorilla involved if known, the contact initiator (tourist or gorilla), and the typical distance from themselves to gorillas during the visit, defined as the closest distance tourists maintained to gorillas for at least

15 cumulative minutes during the hour (to give a measure of general encounter proximity ignoring passing close encounters of short duration). Distances were estimated using a tape measure, with respondents asked to hold one end of the measure while the interviewer backed away from them until the respondent felt the appropriate distance had been reached. Duration was estimated by tourists in seconds.

Results

A total of 361 tourists were interviewed, representing 133 independent tourist tracking groups. While no physical touching events were reported, the mean distance between tourists and gorillas at the time of their closest contact was 2.76 m. This is significantly closer than the 7 m permitted under the current rule. The mean closest distance between tourists and gorillas maintained for at least 15 minutes during the tracking hour was 4.85 m, which again is significantly closer than the minimum allowable.

Contacts initiated by gorillas were closer than those initiated by tourists, and contacts with juvenile gorillas were closer than contacts with adults. Contacts with adults lasted longer than with juveniles, and contacts initiated by go-

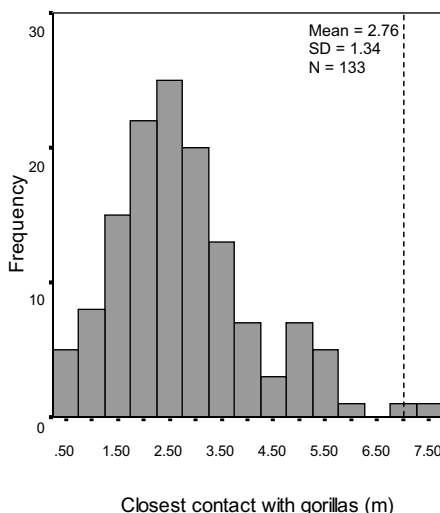
rillas were shorter than those initiated by tourists.

There was no significant variation in closest contact proximity across guides. There was no significant correlation between tips given and closest contact proximity.

Discussion

A previous study of primate tourism in Uganda demonstrated that humans visiting great apes are potential sources of infection (Adams et al. 2001), but did not investigate how close tourists get to these animals, a variable linked to the risk of a disease being transmitted (Woodford et al. 2002). The results of this study address this issue, and show that, in the case of mountain gorillas at Bwindi Impenetrable National Park, tourists get extremely close. The minimum distance rule of 7 m was broken on a daily basis, and contacts with juveniles were closer than with adults. The mean closest distance maintained for at least 15 minutes was significantly less than 7 m, indicating that encounters were not fleeting. These results demonstrate serious problems with the present rules, and that the risk of disease transmission might be greater than previously believed.

There are several factors that help to explain why tourists get so close to gorillas. Firstly, it has been suggested that excessively close encounters occur because gorillas are over-habituated and actually approach tourists, particularly in the case of inquisitive juvenile animals (Graczyk et al. 2001; Mudakikwa et al. 2001). This hypothesis is supported by the results of this study, because contacts initiated by gorillas were closer than those initiated by tourists, and contacts with juvenile individuals were closer than those with adults. Secondly, Bwindi Impenetrable Forest is dense, often making it impossible to get a clear view of the gorillas from 7 m away. This places guides under pressure to allow tourists





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to get closer so that they can see the gorillas clearly. The dense foliage and steep topography also make it difficult to retreat should a gorilla approach the group, and this limits guides' ability to move their visitors back. This problem is likely to be exacerbated by the recent increase in the number of tourists allowed per group from 6 to 8. Thirdly, the gorillas within each group are often dispersed over a wide area, and tourists can find themselves surrounded by them, making it impossible to move away.

These constraints on guides' ability to prevent tourists getting too close to gorillas suggest that in some situations it is impossible to stop excessively close encounters from occurring but cannot fully explain the results of this study. Although the closest encounters were initiated by gorillas, those initiated by tourists were still far closer

than the allowable distance and lasted long enough to suggest that these were not accidental fleeting encounters. One tourist reported being less than 1 m from a gorilla for 10 minutes, an encounter both avoidable and unacceptable.

In defence of the guides, no evidence was found for performance differences between them or for a link between contact proximity and their tips. These findings are contrary to the expectations of some previous authors (McNeilage 1996; Butynski & Kalina 1998).

The results of this study demonstrate that at present the rules governing how closely tourists can approach gorillas at Bwindi Impenetrable National Park are failing, with the 7 m rule clearly not enforced. Even this distance may be dangerous as it is based on research into sneezing and is not a scientific-

ly determined safe distance for gorilla viewing (Baker 1995; Homsy 1999). Changing this rule seems unlikely to help, as reducing or removing the minimum distance would suggest tourists could go closer, and increasing it would make it even less enforceable. Training of guides should be improved, but it seems inevitable that close encounters will go on occurring for as long as tourists are allowed to visit wild mountain gorillas. It may therefore be wise to consider adopting other measures for the reduction of disease transmission risk, such as surgical masks for tourists during their time with the gorillas (Adams et al. 2001) or medical screening and explicit vaccination requirements to reduce the chance of infectious tourists tracking gorillas (Homsy 1999). These possibilities now require urgent consideration because, if action is not taken, there is a risk that the tourists who believe they are supporting gorilla conservation will unwittingly contribute to their further decline.

Chris Sandbrook and Stuart Semple

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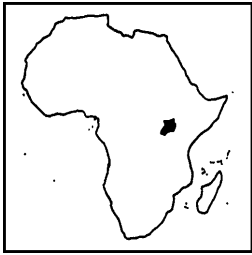
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Young gorilla approaching a tourist group in Bwindi

Photo: Michael Schmitt



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Discussion on Habituation Plans

Recently a number of press articles and email discussions have covered the potential plan to habituate new gorilla groups for tourism in the Bwindi Impenetrable National Park in Uganda. However, as of going to press, habituation has not yet started, pending a review of the issue.

The *Uganda Wildlife Authority* (UWA) is rightly concerned about finances with the upcoming end of *World Bank* funding that has provided support for UWA operations. It is reasonable to expect the authority to explore means of supplementing its income to compensate for the end of this funding, including the possibility of expanding its mountain gorilla tourism programme, which has been providing over 50% of the authority's revenues in recent years. However, rather than rushing into the habituation of a new group, UWA has called a meeting of its research and management staff and advisors at the field level to discuss the issue and to make an informed recommendation to UWA headquarters. This field meeting will take place in the last week of May 2007.

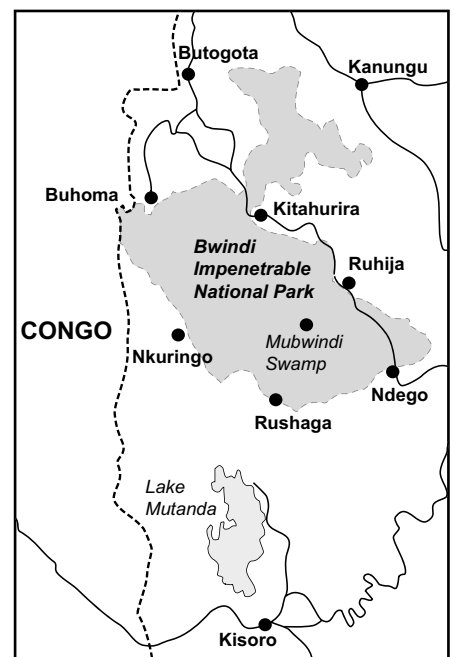
The meeting will be attended by field staff as well as members of the regional advisory panel on mountain gorilla management issues (including tourism) called the Gorilla Management Technical Advisory Committee (GMTAC). The GMTAC was formed as an outcome of regional meetings and was tasked with providing input to the three protected area authorities based on technical debate among people with scientific and management expertise. A number of members of this group have been invit-

ed to the May meeting to provide input on the Bwindi habituation issue.

The GMTAC will use this meeting as an opportunity to test and refine a tool it is developing, called the Habituation Impact Analysis (HIA). The HIA will be a decision-tree model to be used as a guide for addressing the wide range of questions and issues related to the cost-benefit analysis of habituation, whether for research or for tourism. It will guide stakeholders in analysing available information, and in identifying information gaps or alternate opportunities for addressing needs.

The recommendations from the May meeting will be forwarded to UWA headquarters and the UWA board for consideration. Through the results of the May meeting, and followed up with a concerted effort by UWA technical staff and their NGO advisors, we hope to be able to lead the decision/policy makers through a rational analysis of the costs and benefits of habituating additional groups.

Liz Macfie





CROSS RIVER

Use of Genetic Analysis to Determine Population Structure in the Cross River Gorilla

Many animals today, including some gorilla populations, live in patchy discontinuous habitats as a result of human alteration of the environment. When small populations become fragmented and migration between subpopulations decreases or stops, consequent increases in inbreeding and loss of genetic diversity can have serious negative effects on the long-term viability of population fragments and, by extension, the population as a whole. Determining which subpopulations are in migratory contact with each other can highlight important dispersal corridors as well as identify isolated areas, thereby suggesting priority areas for conservation.

We used genetic analysis of a large collection of non-invasively collected samples to assess patterns of population structure and migration in the Cross River gorilla (see Bergl & Vigilant 2007 for a full account). These gorillas are located at least 200 km northwest of other gorilla populations and are largely restricted to rugged highland areas straddling the Nigeria-Cameroon border. Recently revived as a distinct subspecies, *Gorilla gorilla diehli* (Sarmiento & Oates 2000; Groves 2001), the Cross River gorilla is one of Africa's most critically endangered primates (IUCN 2005). Recent surveys suggest that the total population numbers fewer than 300 individuals and is fragmented into as many as 10th separate localities with limited potential for reproductive contact and unknown population structure (Oates et al. 2003; Sunderland-Groves et al. 2003; Sunderland-Groves & Jaff 2004). Despite its distinctiveness and high degree of threat, little is known of the Cross River gorilla beyond cranial morphology, ba-

sic distribution and single-site studies of feeding ecology (Sarmiento & Oates 2000; Oates et al. 2003; Stumpf et al. 2003).

Between December 2002 and September 2004, fecal samples ($N = 322$) were collected from gorilla night nests and trails during intensive nest searches and reconnaissance walks at all but one of the known Cross River gorilla localities. Unfortunately, the small number and poor quality of samples from three other localities (Okwangwo-Takamanda, Takamada East and Takamanda North) resulted in these areas being unrepresented in the analysis. The remaining samples allowed us to conduct a range of genetic analyses to assess population structure and patterns of migration.

Population Structure

We were able to detect a previously unknown population structure in the Cross River gorilla. Our analysis suggests that three subpopulations are present: a large central subpopulation consisting of the majority of known Cross River gorilla localities, and two peripheral subpopulations represented by the gorillas of Afi (western subpopulation) and Kagwene Mountains (eastern subpopulation). This pattern of subdivision corresponds largely to patterns of habitat fragmentation. The constituent localities of the central subpopulation are all connected by continuous forested lowland habitat, with the exception of Mone North which is separated by a small road and scattered farm land. In contrast, Afi Mountain is almost totally isolated from other gorilla areas by farmland and a frequently travelled highway. Likewise, Kagwene Mountain, though connected to Upper Mbulu by a narrow forest corridor, is largely surrounded by substantial areas of montane grassland and farmland.

Migration

Prior research on this population

suggested that migration between gorilla localities was likely rare (Bucknell & Groves 2002; Oates et al. 2003; Sunderland-Groves et al. 2003). Our genetic data show that some animals have migrated between localities within the current generation. We were able to identify as migrants four individuals (two male and two female) from four different localities. Two migrants (one male and one female) each moved from one of the two most isolated localities (Kagwene and Afi mountains) into the nearest neighbouring locality (Upper Mbulu and Mbe Mountains, respectively). However, neither of these two source localities appears to be a recipient of migrants as both are genetically quite homogenous (though one Afi individual apparently does have admixed ancestry).

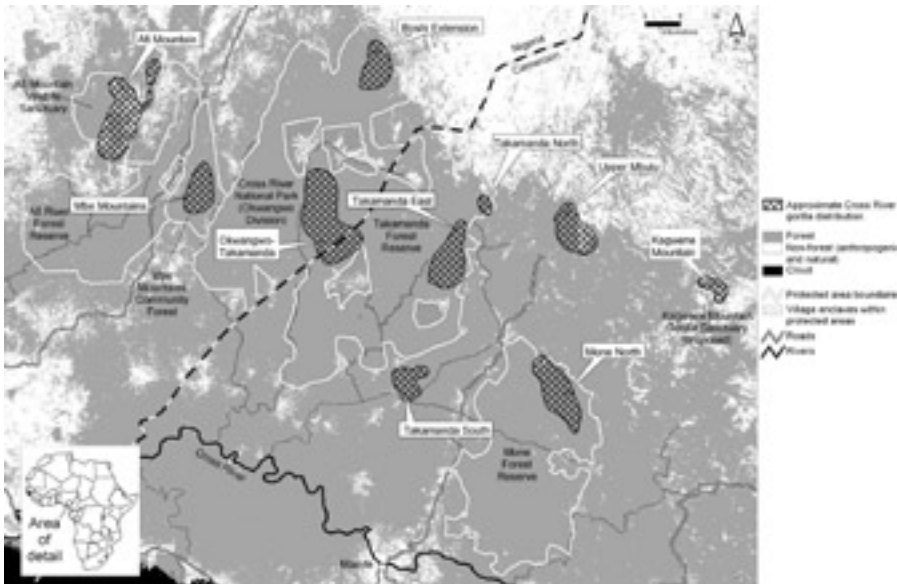
In undisturbed gorilla populations, where there are relatively high densities of gorillas, animals that disperse from their natal group are likely to find other groups or individuals quite readily, whereas in areas such as Kagwene and Afi Mountains, where there appear to be only single social groups or very small communities of gorillas (Oates et al. 2003), opportunities for dispersing individuals to find new groups will be limited. Thus, dispersers will be under pressure to travel long distances or cross barriers such as roads and disturbed forest, potentially resulting in large dispersal distances. This may explain why individuals migrated from even relatively isolated areas like Afi and Kagwene.

The other two migrants detected were collected in Takamanda South and Mone North, but could not be definitively assigned to a source population. Likely source localities for these migrants, based on geographic proximity, are among the unsampled gorilla areas.

In addition to these migrants, several individuals of admixed ancestry were detected. This suggests that migrants



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Approximate distribution of the Cross River gorilla in Nigeria and Cameroon (Bechati-Lebialem gorilla locality to the south-east not shown). Distribution of forest and non-forest based on Landsat 7 data from January 2003. Gorilla locality names are indicated by text boxes.

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are not only able to move between localities, but are also reproducing.

Conservation Implications

The genetic population structure we detected in Cross River gorillas has important implications for the conservation and management of this critically endangered primate. Overall, our analyses suggest that the situation facing this population is not quite as dire as had been assumed. We documented reproductive connectivity during the current generation between several localities, including the most peripheral population nuclei, and genetic similarity between most of the sampled localities. Using conservative criteria, approximately 11% (8 of 71) of individuals were inferred to be migrants or to have recent ancestry from more than one locality.

Conservation efforts must, therefore, focus on the maintenance, and if possible, expansion, of forest connec-

tivity between gorilla localities. While such actions present a challenge for both conservation biologists and wildlife managers, the situation allows for some optimism given that substantial habitat remains between many of the areas. Only two of the gorilla localities are separated by habitat discontinuities (i.e., roads separating Afi Mountain and Mone North from the central portion of the gorillas' range), and, even in these cases, forested habitat abuts the discontinuity. In all other cases, at least narrow forest corridors (and in many cases large continuous areas of forest) connect the population nuclei.

Much of the forest which constitutes Cross River gorilla habitat is already legally protected, and several additional areas are currently being considered for protected area status. Yet key corridors, such as those between Kagwene Mountain and Upper Mbulu, and between Mone North and the other members of the central subpopulation, cur-

rently have no legal status. Revision of the status of these areas needs to be considered.

Besides habitat loss, other human activities, such as bushmeat hunting in particular, can also limit migration. Extensive hunting in lowland areas is likely the main cause of the gorillas' current distribution in the highlands. This pressure needs to be relaxed in order to allow migration through, and potentially recolonization of, lowland habitat. Control of hunting is particularly important in the center of the gorillas' range, which contains the largest concentration of gorillas and substantial areas (approximately 1,300 km²) of continuous forest.

Richard A. Bergl and Linda Vigilant

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Launch of A.P.E.S. Database

Over the last three decades an impressive effort has been focused on gathering information on the distribution and abundance of the remaining gorilla, chimpanzee, bonobo and orangutan populations. These surveys provide convincing evidence that the numbers of great apes are declining rapidly as a result of habitat destruction, commercial bushmeat hunting and disease epidemics in many regions. It is essential that ape populations, their habitats and current threats are monitored to evaluate population trends and to plan towards their long-term survival. Ape nest counts and other signs provide the baseline

data for addressing issues ranging from prioritization of populations for monitoring and protection efforts and making recommendations for conservation action, as well as assessments such as the IUCN *Red List of Threatened Species*. But it has proven to be difficult to determine the global status of great apes while these datasets, collected and analyzed by a diverse group of individuals and organizations, remain dispersed.

Researchers from the Department of Primatology at the Max Planck Institute for Evolutionary Anthropology (MPI EVAN) have now developed the Ape Populations, Environments and Surveys (A.P.E.S.) database (<http://apes.eva.mpg.de>) in collaboration with the Section on Great Apes (SGA) of the IUCN/SSC *Primate Specialist Group*. Our overall objective is to provide an accurate picture of the distribution and abundance of great apes, and thus inform about long-term management and conservation strategies for these taxa. Information on ape distribution, nest encounter rates, temporal population trends and, where available, abundance estimates will be compiled and made available to individuals interested in collaborating on this project. MPI EVAN will provide a support service for survey design and data analysis to contributors. The A.P.E.S. team is also willing to analyse data on behalf of researchers and others, such as logging companies who participate in the monitoring of great ape populations (the SGA will soon publish “Best Practice Guidelines for Reducing the Impact of Commercial Logging on Great Apes in Western Equatorial Africa”).

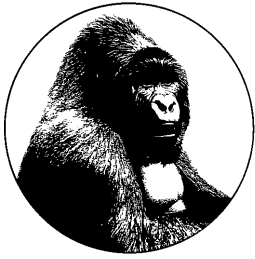
The success of this endeavour will depend largely on the willingness of individuals and institutions to contribute and to participate. An “IUCN data access and release policy” has been formulated, which allows data owners to specify parameters of use of any dataset contributed to A.P.E.S. Quality of the

information stored will be ensured by a Data Review Working Group (DRWG) that will assess data sets and attribute a quality category to each survey.

So far, the database developers have focused on cataloguing published surveys and soliciting researchers to contribute any data available. Approximately 200 surveys of gorillas and chimpanzees have been listed to date, with a further 300 thought to exist but yet to be acquired. We are now expanding the database to include bonobos and orangutans, and survey information from Malaysia and Indonesia is being entered. The website also features an interactive map which links survey data to geographic locations, providing a user-friendly means for searching by country or region. A.P.E.S. Status Reports will be produced by the DRWG and the first progress report will be published in 2008. In addition, biannual newsletters will provide updates to interested parties. If you or your organization/institution wish to subscribe, please send an email to apes@eva.mpg.de, specifying “A.P.E.S. news” in the subject line.

The A.P.E.S. database should be considered a work in progress. Feedback from users will be essential to ensuring the database is functionally useful and provides information in a user-friendly way. Its envisioned outcome will provide a better understanding of great ape populations with direct implications for the efficacy of large-scale population monitoring efforts. We therefore would like to use this opportunity to encourage researchers with survey data to consider making them available to A.P.E.S. Datasets can either be uploaded directly to the website or can be sent via email.

Please do not hesitate to contact us, if you have questions or suggestions with regard to this project by emailing: apes@eva.mpg.de
A.P.E.S. website:
<http://apes.eva.mpg.de>



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IUCN/SSC Primate Specialist Group:

<http://www.primate-sg.org>

Max Planck Institute, Department of Primatology:

<http://www.eva.mpg.de/primat>

Hjalmar Kuehl, Liz Williamson, Crickette Sanz, David Morgan and Christophe Boesch

Orphan Gorilla Management and Reintroduction: Progress and Perspectives

In a two-month period between September and November 2006, four babies were born to a reintroduced group of western gorillas in the Republic of Congo. This was the culmination of two decades of committed efforts by the *John Aspinall Foundation*, a UK registered charity, to find a solution to the problem of Central African bushmeat orphans (Courage & Harvey 2003). From the beginning, reintroduction was a controversial long-term objective of what began in 1987 as the Brazzaville gorilla orphanage (Attwater 1990a, 1990b; Courage et al. 2001; King et al. 2005b). From 1996 to 2001, initial releases in the Lesio-Louna Reserve, 140 km north of Brazzaville, proved that gorilla survival could be surprisingly high (82%; King et al. 2006a, 2006b).

However, a lack of significant natural boundaries between the released gorillas and human activity led to that first release programme being abandoned. Four adult males had to be returned to captivity, while two stable mixed-sex groups were relocated to the neighbouring south-west Lefini Reserve in 2003 and 2004 (King et al. 2005a, 2006a). It was the first of these relocated groups that produced the first baby born to reintroduced gorillas, in April 2004.

Following the birth, one of the two adult males in the group became gradually solitary, increasing his ranging

and finally encountering the second released group. Despite being significantly larger and stronger than the males in the second group, the silverback remained solitary, although occasionally succeeded in splitting one or more females away from the remainder of the group for a few days at a time. It is probable, then, that it is this solitary silverback who is the father of the four babies born in late 2006 (King & Courage 2007).

However, his aggressive behaviour towards the group had led to him being transferred to a forested island on the edge of the reintroduction site a few months before the births. This had the dual benefit of increasing the female : male sex ratio of the released gorillas, and of facilitating the release of three sub-adult females to the area in October 2006. These females were rapidly found by the silverback from group 1, and have since integrated into that group, which now consists of one silverback, 3 adult females, 3 subadult females, and 1 infant male. Sadly, one of the four newborns in group 2 was

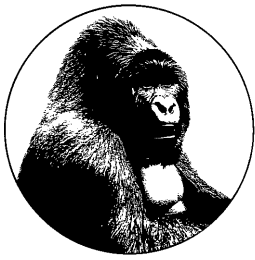
lost in December, so that group 2 now consists of 4 blackback and subadult males, 5 adult and subadult females, and 3 infant males. No further releases are planned in the immediate future, with the orphan rehabilitation group currently consisting of just one 3-year-old female and one 1-year-old male.

These results illustrate that gorilla reintroduction is a feasible and realistic conservation strategy, given sufficient long-term technical, financial and political commitment, in this case provided by a working partnership between the *John Aspinall Foundation* and the government of Congo (see King et al. 2006a for details). A similar programme was set up in 1998 in neighbouring Gabon, again with the *John Aspinall Foundation* collaborating closely with the national government (Courage et al. 2001; King et al. 2006b; Mahé 2006). Due to the younger age of the released gorillas in Gabon, it will be several years before the results of the two projects can be compared. Nevertheless, they provide an unrivalled experience in gorilla rehabilitation and re-



Three of the four babies born in late 2006 with their mothers

Photo: Tony King



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introduction, an experience invaluable to other projects considering gorilla re-introduction elsewhere in Africa (Cress 2006). General guidelines for primate reintroduction are already available (IUCN 2002), and are currently being refined for the case of great apes. However, some key issues arising from the Congo gorilla reintroduction project are worthy of further discussion here.

Release Site

It has been said before, but it is worth repeating here, that while the general area for a gorilla reintroduction may be identified through consideration of several ecological, sociological and political criteria (IUCN 2002), the presence of effective ecological barriers between the released gorillas and all human activity should define the specific site for release (King 2005; King et al. 2005a, 2006a). The first reintroduction attempt in Congo, in the Lesio-Louna Reserve, was finally abandoned due to the lack of such barriers, as local populations had several user rights in the reintroduction site, the small rivers and steep escarpments present in the Lesio-Louna proved insufficient in discouraging gorilla movements out of the site, and electric fences proved inadequate for protecting project camps. Large rivers appear to be the most suitable barriers, and are now used

in both Congo and Gabon to separate released gorillas from villages, project camps and local-use zones.

Genetic Viability

One of the major unresolved issues in the Congo programme is the genetic viability of a population based on small numbers of rehabilitated orphans. This issue is a function of the source of the release stock: the rehabilitation programme for illegally-held orphan gorillas confiscated by the Congolese government. The number of orphan gorillas arriving at the rehabilitation project has declined dramatically from an average rate of 10 per year between 1990 and 1994 to 1.4 per year between 2000 and 2004 (King et al. 2005a, 2006a). In 2005 no gorilla orphans were received, and the hope was that the live orphan trade in Congo had been more-or-less broken.

Sadly, 2006 saw the arrival of 4 gorillas, the highest annual total for 10 years, and a simultaneous influx of chimpanzee orphans, prompting fresh efforts amongst conservation bodies in Congo to tackle the issue. The success of these efforts remains to be seen. It has been a long battle in Congo over the past 20 years, and it is perhaps unrealistic to hope for an absolute cessation of the orphan trade. Therefore it seems probable that new orphans will be added to the rehabilitation programme at a low rate over the foreseeable future, providing small numbers of supplementary release stock for the reintroduction programme in the future. Population modelling based on the current (known) released gorillas and the future (unknown) potential release stock will help assess the long-term viability of the reintroduced population, and give an idea of the required rate of reinforcement.

Adult Male Ranging

Several of the problems faced by the Congo project over the past 10 years



Masissa and Titi, two of the five residents of Abio island

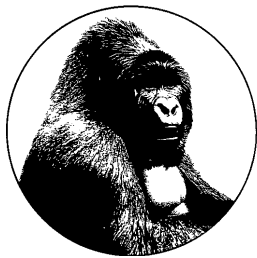
Photo: Tony King

have been due to the phenomenon of adult males being rejected from their long-term group, and suddenly expanding their ranging behaviour. While mixed-sex groups have shown a tendency to utilise a home range of 10 km² or less of forest, solitary males have frequently made rapid excursions outside of their former ranges, often to the extent of leaving the boundaries of the reintroduction site (King et al. 2006a).

Knowledge of wild western gorilla societies shows that such behaviour is only to be expected, as wild groups tend to consist of only one silverback male, an average of 3 adult females, plus various numbers of immatures (Parnell 2002). Adult males surplus to this organisational structure naturally find themselves solitary, and can track groups over several days (Tutin 1996), generally remaining solitary or forming new groups by attracting one or more adult females (Parnell 2002).

One classic example of such behaviour was observed when, as described earlier, one of the males of the first group released to the south-west Lefini became solitary following the birth of a baby to the dominant female. The subsequent increase in his ranging led him to eventually locate the second released group, whom he followed for a year and a half, although without suc-





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ceeding in attracting the group females for any sustained period of time.

However, the lack of numerous groups in the Congo reintroduction programme has meant that other solitary males have been unable to locate a new group. Rather, their increased ranging has led them to the limits of the reintroduction site, and into zones of human activity from which they have had to be removed for safety reasons.

A natural response to this issue is to reduce the number of potential solitary males by increasing the female : male sex ratio of the release stock, and by increasing the number of released groups to improve the chance that a solitary male will locate and follow a new group. However, in the absence of a surplus of gorillas available to form new groups, or of females to improve the sex ratio, in reality this has meant the removal of solitary males from the reintroduction programme, either temporarily or permanently. Such a strategy has naturally led to the management of a captive bachelor group.

In Congo, the group currently consists of 5 males, aged between 15 and 20 years, living on a 25 ha forested island at the southern limit of the reintroduction site, created by joining an old ox-bow lake to the current river. The youngest was transferred to the island in July 2006, by bribing him to cross a temporary bridge directly from

the reintroduction site. The remaining 4 had been caged at Lesio-Louna for between 6 and 10 years each, and were released onto the island over 2 days in March 2007.

The island supports over 175 plant species, of which at least 63 have been observed to be utilised as food sources by reintroduced gorillas in the Lesio-Louna (Nsongola et al. 2006). Nevertheless, daily supplementary feeding will be necessary to support the 5 silverbacks over the coming years. The feeding regime facilitates observations of social dynamics within the group, which is probably the most mature bachelor group in captivity.

While the island appears to provide a long-term solution for the management of these solitary males, it is doubtful whether future solitary males could be added to the group. The reintroduction programme will need to continue to be carefully monitored to try to preempt further problems with future solitary males.

Impact of Human Presence

A final issue long-recognized as challenging to the long-term success of the reintroduction is that of the impact of human presence on the gorillas (King et al. 2005a, 2006a). The risk of disease transmission due to close contact between great apes and humans is well-known, and health aspects figure strongly in reintroduction guidelines (IUCN 2002). A further aspect which is arguably equally well-known, but perhaps harder to quantify, is the risk of behavioural changes due to human presence (eg. Muyambi 2005).

The nature of the gorilla psyche means that an emotional bond is usually necessary to ensure the survival of newly-arrived gorilla orphans (King et al. 2005b), in practice often provided by a dedicated human "substitute mother". However, once created, such emotional bonds are hard to break, particularly if long-term human presence is

maintained for activities such as post-release monitoring, considered essential for evaluation of reintroduction efforts (IUCN 2002).

In both the Congo and the Gabon gorilla reintroduction projects, post-release monitoring has been reduced to a minimum daily or even weekly determination of group position, composition, and general health, to avoid excessive disruption of gorilla behaviour. It appears that the stable nature of gorilla groups, in contrast to the fission-fusion nature of chimpanzee groups, leads to what may best be described as a "You're either with us or against us" mentality, particularly amongst the dominant group members. It is abnormal for gorilla group members to come and go, and so with the distinction between gorillas and humans being confused from an early age, the same applies to humans (Mahé 2006).

The most severe implications of this phenomenon seem to arise when human presence gives the impression of competition for group females, provoking a natural defensive reaction from the group silverback. Such a situation has obvious safety concerns for the humans if not managed appropriately, or even for the gorillas if the humans happen to be armed. While defence of females is probably the primary cause for conflictual gorilla-human relations, apparent competition for food is another. Rehabilitated gorillas learn that humans are a good source of food, and will react to humans accordingly. Any attempts by humans to resist can lead to conflict, again with obvious safety concerns.

Experienced staff members with a good understanding of the individual gorillas are able to react appropriately to such situations, and are therefore capable of undertaking the post-release monitoring programme. Other people, however, are not, hence why it is necessary to prohibit any local user rights in the reintroduction site, and to



The 25 ha Abio island, home to a bachelor group of 5 silverbacks

Photo: Tony King



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ensure the released gorillas remain within the defined site.

A further complication is, of course, tourism (King et al. 2006b). The widely-publicised success of the mountain gorilla tourism programme has led to huge political pressure and expectations for gorilla tourism elsewhere. Efforts to develop tourism with wild western gorillas are still relatively new, and have encountered numerous difficulties (eg. Greer & Cipolletta 2006). Many of these difficulties apply equally to efforts to develop tourism with the reintroduced gorillas in Congo, with the added problem of the need to provide a barrier between the gorillas and the visitors to avoid the potential conflicts described above.

In reality the only effective barrier has been found to be deep water, so visitors are obliged to view the gorillas from a boat or from an opposing riverbank. A pre-requisite to such a strategy is that the gorillas must be close enough to the water to be viewed, which can not be guaranteed. The recent development of the forested island for the group of adult males currently "surplus" to the reintroduction programme may provide a solution to the problem, as the feeding regime provides virtually guaranteed daily observation opportunities. If managed wisely, this will also remove the pressure of tourist visits from the reintroduced groups, and the subsequent negative impacts on their behaviour and "dehabitation".

Conclusions

It is now 20 years since the *John Aspinall Foundation* began working to find long-term solutions to tackle the trade in live gorilla orphans arising from the uncontrolled bushmeat trade in western Central Africa. In Congo, based on orphan arrival rates, the trade has been dramatically reduced since the late 1980s and early to mid 1990s, although a worrying increase in gorilla and chimpanzee orphan

confiscations in 2006 requires a renewed and collaborative response amongst authorities and NGOs. The reintroduction of orphan gorillas has been shown to be feasible, given appropriate long-term support. Four wild births in late 2006, and the continued progress of the first baby born in 2004,

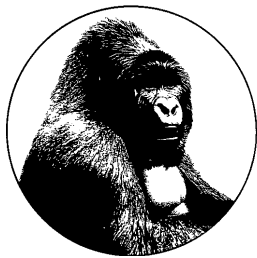
are an indication of the success of the programme.

However, it has not been without its difficulties, and it should be stressed that the management of orphan gorillas should not be undertaken lightly. The fashion of using orphan gorillas as tourist attractions is particularly worrying,



Téké, the first baby born to reintroduced gorillas, now 3 years old

Photo: Tony King



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Bangha, the probable father of the 2006 babies

Photo: Tony King

as appears increasingly to be the case in Gabon for example (Cress 2007), as the lack of law enforcement protocols will naturally lead to the support of an illegal supply chain to satisfy the demand. Additionally, while baby gorillas are adorable, adult gorillas are clearly difficult and costly to manage. An effective collaborative response is urgently required to tackle the numerous issues related to the management of orphan gorillas in Central Africa, a response which now has the advantage of learning from two decades of pioneering gorilla rehabilitation and reintroduction efforts in Congo and Gabon.

Tony King and Christelle Chamberlan

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Gorilla Workshop 2008

Disney's Animal Kingdom and the Brevard Zoo are pleased to host the 2008 Gorilla Workshop. The workshop will be held at the Radisson WorldGate Resort in Kissimmee, Florida, January 23rd through January 27th 2008. Our keynote speakers will include Mbeli Bai field researcher Thomas Breuer, Doug Cress of the *Pan African Sanctuary Alliance* (PASA) and Alecia Lilly of the *Dian Fossey Gorilla Fund International* (DFGF-I). Your US\$ 195 registration fee will cover many of your meals, coffee breaks, a conference T-shirt and a specially made bag. In addition, US\$ 10 of each registration fee will be used to support in situ conservation project(s).

For more information, to register and to submit abstracts please see our website: www.2008gorillaworkshop.com



READING

Gottfried Hohmann, Martha M. Robbins, Christophe Boesch (eds.), Feeding Ecology in Apes and Other Primates: Ecological, Physiological and Behavioral Aspects. Cambridge (Cambridge University Press) 2006. XVI, 523 pages. Hardcover. US\$ 130, £ 70. ISBN 978-0-521-85837-2.

This book presents new research results – and it is the African apes that are especially well represented in the book. The first section comprises field studies on African apes from eastern to western Africa (+ one capuchin study). The observations of sympatric species are particularly interesting.

In addition to these field study reports, the book also has chapters dealing with the theoretical background as well as nutritional analyses. The theory section discusses foraging adaptations, socioecological models, hunger and aggression as well as food availability – both in general, and concentrating on particular primate taxa (including humans). The nutritional ecology section, also, includes general contributions as well as specific ones.

As African apes are central to the book, it will hold a special interest for those working with these species, either in the wild or in captivity; but certainly it will be equally interesting for any other primatologist working on feeding ecology, especially because of the general character of sections 2 and 3, where there are important methodological discussions. In those contributions, it becomes clear that, while we have learned a lot from field studies over the last decades, many open questions still remain.

Angela Meder

Volker Sommer and Paul L. Vasey (eds.)

Homosexual Behaviour in Animals: an evolutionary perspective. Cambridge (Cambridge University Press) 2006. 382 pages. Hardcover. £ 70, US\$ 125. ISBN 978-0-521-86445-1.

Male and female homosexual behaviour has been observed in many animal species. This book comprises 6 interesting examples in birds and non-primate mammals – as well as 6 primate examples (including one about humans). There are only very few species whose homosexual behaviour has been published in the general media (especially the bonobo), so it has often been regarded as something very unusual, even by some zoologists. This is not the case, as this book shows: in some species homosexual contacts are observed very frequently. Hypotheses for the adaptive value of this behaviour are discussed in contributions on particular species and in general overviews; in some cases, homosexual activities may not have a specific function but rather be a by-product of evolution.

This is an important book not only for everybody who studies animal behaviour, but also for those who regard homosexual behaviour in humans as “unnatural”; it is widespread in the animal kingdom that we belong to, and it would be very unusual if it would not be common in humans too.

Angela Meder

Dale Peterson

Jane Goodall: The Woman Who Redefined Man. New York (Houghton Mifflin) 2006. 740 pages, 42 photos. Hardcover. US\$ 35. ISBN: 978-0-395-85405-1

After having worked with Jane Goodall on several books, Dale Peterson has now written an impressive biography. For everybody who has been fascinated by this pioneer of ape research, as well as for primatologists who are more familiar with Jane Goodall's scientific work, this book offers interesting background information on her exciting life. Heavy volume as it is, it is written in such a very vivid style, that it is a pleasure to read. It is very obvious that not only does the author know Jane

Goodall very well, he also knows how to describe her life in intimate detail without invading her privacy.

Angela Meder

Iris Weiche

Social relationships in captive gorilla females. Doctoral thesis. Göttingen (Cuvillier Verlag) 2006. 240 pages. Paperback, Euro 36. ISBN 978-3-86537-851-4

R. Bushell and P. Eagles (eds.)

Tourism and Protected Areas: Benefits Beyond Boundaries. Wallingford (CABI Publishing) 2006. 416 pages. Hardcover, £ 60, US\$ 100. ISBN 978-0-85199-022-4

Winfried Henke and Ian Tattersall (eds.)

Handbook of Paleoanthropology. 3 volumes. Heidelberg (Springer) 2007. 2173 pages. Euro 854.93. ISBN 978-3-540-32474-4

Matthew J. Ravosa and Marian Dagosto

Primate Origins. Adaptations and evolution. (Springer) 2006. 859 pages, 149 illustrations. Hardcover, Euro 134.95, £ 104, US\$ 169. ISBN 978-0-387-30335-2

Luca Tacconi (ed.)

Illegal Logging – Law Enforcement, Livelihoods and the Timber Trade. Earthscan Forestry Library. London (Earthscan) 2007. 288 pages. Hardcover, £ 29.95, US\$ 76. ISBN 978-1844073481

William F. Laurance and Carlos A. Peres (eds.)

Emerging Threats to Tropical Forests. Chicago (University of Chicago Press) 2006. 520 pages, 44 halftones, 63 line drawings, 27 tables. Hardcover US\$ 110.00, ISBN: 978-0-226-47021-4. Paperback US\$ 40.00, ISBN: 978-0-226-47022-1



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William T. Close

Beyond the Storm: Treating the Powerless and the Powerful in Mobutu's Congo/Zaire. Meadowlark Springs Production 2006. 343 pages. US\$ 25.95. ISBN 978-0970337146

Internet

Forests in Post-Conflict Democratic Republic of Congo. Analysis of a Priority Agenda. 2007. XXI, 82 pages. Can be downloaded at www.cifor.cgiar.org/publications/pdf_files/Books/BCIFOR0701.pdf

Finances

Income in 2006

Subscriptions	15,668.88 Euro
Donations	35,949.05 Euro
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Total	51,543.48 Euro

Expenses in 2006

Administration	359.47 Euro
<i>Gorilla Journal</i>	5,403.17 Euro
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Bwindi

Gorilla census	2,376.48 Euro
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Rwanda

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Nigeria

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Donations

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We are very grateful for this help and thank them for their contributions – as well as all the other supporters whom we could not name here.



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