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No. 63, December 2021

A Year without Rangers

New Grauer's Gorilla Population Estimate

Bushmeat and COVID-19; What is the Connection?

Predicting Range Shifts of African Apes

BERGGORILLA & REGENWALD DIREKTHILFE

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Photo: Christian Kaiser

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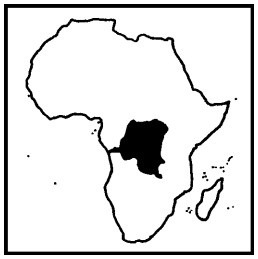

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10 October 2021

A Year of Protection of the Sarambwe Nature Reserve by Trackers Unsupported by Rangers: Results and Lessons Learnt

The protection of protected areas in the Democratic Republic of the Congo is carried out by ICCN eco-guards. They are armed and have the right to defend themselves in case of aggression and may act in the form of summons. Eco-guards have the right to apprehend poachers, to charge them and to transfer them to the courts for correction.

On 10 October 2021, a year ago, the ICCN (Institut Congolais pour la Conservation de la Nature) together with loyalist military personnel assigned to this reserve who worked with the trackers for the conservation and protection of the reserve withdrew from the Sarambwe Nature Reserve following an attack on the post which resulted in the death of a ranger. The withdrawal of the eco-guards has put a halt to protection: the old habits of the population have quickly re-emerged, including poaching, the grazing of domestic animals, the cutting of wood, and the clearing of forest for fields. These activities had ceased completely after the Democratic Republic of the Congo determined the State border together with Uganda in 2019.

The border was first defined in 1915, and this forms the basis of the current demarcation. However, many border markers were not put into place during the initial demarcation of the border between the DRC and Uganda, carried out by the Belgians and the British in 1926. By the end of this first work some border markers were in place, but unfortunately some of these were excavated by people who believed that valuable materials had been buried there. As a result, there has been widespread uncertainty about the accuracy of the border line between the DRC and Uganda.

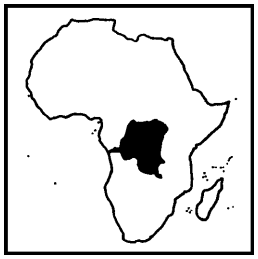
Officer Bararuha with new border demarcation

Photo: Getride Nzanzu

For over 10 years Ugandans have been invading the Sarambwe Reserve in the pursuit of illegal activities such as agriculture, pit-sawing, poaching and grazing of livestock, under the protection of the Ugandan military and violating the State border in the process. Approximately one quarter of the reserve was affected by those illegal activities.

In March 2019, the two governments sent their respective experts to deal with this issue and to help with the delimitation of boundaries. The same team returned on 5 June 2019 to carry out work on the demarcation of a 16 km stretch from the confluence of the Ivi and Kagera rivers to Nyabwishenya (in the Sarambwe Reserve) and from Nyabwishenya to Kabwa Hill (the Ugandan/Congolese border outside the reserve). The border is marked by posts, which makes it easier for the trackers to identify any border violations.

The withdrawal of the rangers and the military effectively ended the con-



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Cows grazing in the Sarambwe Reserve

Photo: Getride Nzanzu

servation of the reserve. The former poachers and encroachers have returned and are free to carry out their illegal activities. All these people are trying to make the most of the situation as quickly as possible. Four days after the rangers left, the alarm was given that the reserve was being encroached. Almost immediately, the trackers resumed their work without the rangers, and they continue alone to this day.

Result: a Year of Work by the Unsupported Trackers

The greed for natural resources and the search for more arable land leads to poaching, the grazing of domestic animals, the cutting of firewood, deforestation and land clearing, and the establishment of fields in protected areas. This can happen anywhere, but it is particularly prevalent in the eastern DRC. An abandoned protected area in this part of the country, especially one the size of the Sarambwe Reserve (around 900 hectares), can be completely destroyed in less than six months.

In Gorilla Journal 61, published in December 2020, we reported on the trackers' decision to continue their work despite the absence of the eco-guards and the military. We demonstrated that the activities of the trackers resulted in the cessation of illegal activities, particularly pit-sawing, hunting with dogs and the establishment of new fields.

From January to September 2021, the trackers have continued their herculean labour. Two patrol teams were established and the entire reserve was covered once a week. 270 patrols were deployed in 189 days and 712 observations on wildlife were made. Because the reserve is small, we are particularly interested in the observations of flagship species and in estimating their number or group compositions.

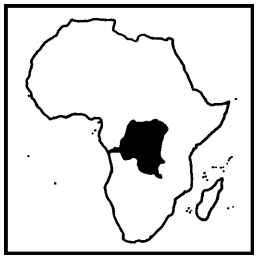
Signs of the presence of gorillas were observed during each of the 9 months. We estimate that 18–23 gorillas visited the reserve between January and April. Between May and July, 20 gorillas visited the reserve. They were members of 3 groups of 3, 6 and 10 individuals, respectively, plus a lone individual. The same 3 groups and the lone individual were observed during August and September.

Elephants were observed in the reserve in January, May, June, July and September 2021. Their number varied between 1 and 3 individuals.

The most represented primate species are red-tailed monkeys, black-and-white colobus, baboons, chimpanzees and blue monkeys – they were all observed throughout the reserve. At 12–25 encounters per month, red-tailed monkeys were observed most frequently. They form several groups of between 6 and 36 individuals. Baboons were observed 9–16 times a month in groups of 3–36 individuals. Black-

Attempt to exploit minerals

Photo: Getride Nzanzu



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Sarambwe trackers with new equipment *Photo: Getride Nzanzu*

and-white colobus were encountered between 6 and 14 times a month in groups of 4–44 individuals. Chimpanzees were seen in up to 4 groups with 6, 6, 8 and 12 individuals, respectively.

The other flagship species seen in the reserve were bush pigs and duikers.

Illegal activities were mainly located at the edge of the reserve, at the border between Uganda and the DRC, where Bwindi National Park does not touch the reserve. These activities include attempts to cultivate crops within the reserve, people travelling through the area, trapping and the grazing of domestic animals. Illegal activities were at a very low level between January and August 2021, but intensified in September 2021, when several fields up to 10 hectares in size were prepared for cultivation, 11 traps and some cows were found within the reserve.

The trackers have been indefatigable in their efforts to discourage illegal activities. All the planted fields were destroyed and the fields under preparation were monitored to prevent further activities. In January, three Ugandan goats were confiscated and returned to their owners once sensitised as to the illegality of their actions. In April, a Ugandan poacher was arrested and turned over to the immigration service of Kisharu, a village adjacent to the reserve. The trackers have visited Uganda three times to raise awareness among local chiefs and the military for

A Year without Rangers – but not without Protection!

After a ranger had been killed during an attack on the Sarambwe ranger post on 10 October 2020, the national park authority ICCN withdrew the rangers and the military stationed there. Our project manager Claude Sikubwabo assumed that they would return after a while, but this has not happened. As a result, illegal activities in the protected area, which were quite well controlled until then, have increased.

We continued to provide financial support to the trackers who determined to stay and continue their patrolling activities despite the high security risk. Thanks to their commitment, illegal encroachment has largely been stopped. For a year now, the trackers have been solely responsible for the Sarambwe Reserve, and they have managed to protect it without the help of rangers or the military and without firearms.

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We propose to reward this tremendous achievement with a special bonus for the trackers. We would be happy to receive donations – the trackers deserve it. If you would like to contribute, please donate and use the word 'Sarambwe' as the payment reference.

You are also welcome to donate via PayPal if you prefer this: http://www.berggorilla.org/en/help/donate

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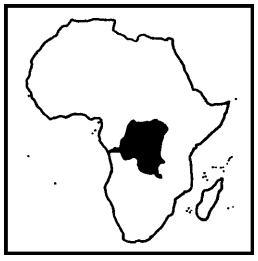

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the protection of the reserve.

In summary, the trackers have lived up to the challenge of protecting the Sarambwe Nature Reserve despite the absence of eco-guards and the military and without carrying firearms. One of the lessons to be learned is that the local population is capable of managing nature reserves if it is taken care of and is mentored.

Claude Sikubwabo Kiyengo

New Grauer's Gorilla Population Estimate

A recent paper in the *American Journal of Primatology* by Andrew Plumptre and colleagues examined the largest survey dataset for Grauer's gorillas *Gorilla beringei graueri* to date, collected between 2011 and 2019. Grauer's gorilla range covers over 15,000 km^2 (just under 5,800 square miles, or an area equivalent to half the size of Belgium) in the eastern Democratic Republic of the Congo. The paper has updated our understanding of how many Grauer's gorillas exist in the wild, and the trend in that population size.

In a 2016 paper, the same research group showed that the estimated decline of Grauer's gorillas was more than 80 % over a single generation, putting it squarely into the "Critically Endangered" category of the IUCN Red List. That estimation used the nest count data collected on line transects across the region in the mid-1990s, and compared it to newer information collected between 2011 and 2015. The more recent information was of three types – data on ape nests from line transect surveys, as before; nest data collected on "reconnaissance walks" that linked the transects, and information on gorilla presence collected by rangers (within parks) and local community ecoguards (within community reserves). All these data were georeferenced. As well as the 80 % decline, the 2011–2015 dataset produced a population estimate of about 3,800 Grauer's gorillas (down from 16,900 animals in

Obituary: Fazili Hussein, Leader of the Mandimba Village Grouping

Fazili Hussein was born on 14 June 1943 at Amamokosa in the Mandimba village grouping, Bitule sector, Lubutu territory in Maniema Province of what is now the Democratic Republic of the Congo. He was the seventh leader of that village grouping as well as its longest serving, with his leadership continuing from 1968 until his death in 2021. He was the most appreciated leader: during his mandate he initiated and implemented numerous projects, building primary schools and dispensaries, launching fish farming and setting up water distribution systems.

In addition to working for his community, Fazili Hussein also invested significant time in the conservation of Maiko National Park (MNP). He was the self-appointed ambassador of the ICCN within his community, which was initially opposed to the establishment of the park within the village grouping. His determination to protect biotopes was clearly evident: he granted the concession where the Headquarters of the MNP now stands, was one of the initiators of the retrieval of 12-gauge hunting weapons, and inaugurated the MNP's motorised canoe and Health Centre. He also launched the collaboration between the FDS (Simba Divine Forces, a local rebel group set up in 1964 and active since 1967) and the ICCN by initiating patrols in the areas occupied by the Simba. His work was recognised by his receiving of the Abraham Prize, awarded by the Abraham Foundation for achievements in conservation work.

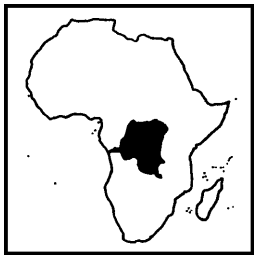
After the inauguration of our health centre, he became the first patient to be cared for by them. A month after he was admitted, he asked those in charge whether he could use a MNP vehicle to take him to Kisangani for some rest. It was there that he passed away. The funeral took place the next day in the midst of his community, who were inconsolable, especially as another member of his family had also died around the same time. The burial took place at his property in the presence of the Lubutu territory administrator, leaders of village groupings and localities of the honourable Oleko, National Deputy/Parliamentarian native to the area, members of the wider Security Committee and the FEC. The ceremony remained calm despite disturbances caused by some youths who attacked the property of the peaceful population. The local tradition is that when somebody dies, the other tribes must contribute to the burial ceremony, but one often notices an overflowing of emotion among the tribe of the deceased.

Fazili Hussein leaves behind a widow and many children.

Elie Mundima N'Kuba

Fazili Hussein (left) with park chief Jean Claude Kyungu

Photo: ICCN



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Espoir (Hope), the youngest gorilla on Mt. Tshiaberimu, was born in January 2020. *Photo: ICCN*

the mid-1990s, before the civil war in the region).

From 2015 to 2019, further line transect surveys were carried out: almost all of the Kahuzi-Biega National Park (a known Grauer's gorilla stronghold) and all of the recently recognised Oku Community Reserve were covered. The Oku Community Reserve was created because it was also known to be a stronghold for the Grauer's gorilla. The new survey results have provided a more accurate overall population estimate than in 2016, and show that there are almost twice as many Grauer's gorillas than previously believed – the revised estimate is around 6,800 individuals. This reflects the improved spatial coverage of the area of interest achieved during the 2015–2019 surveys that have provided a more representative dataset, leading to a more accurate estimate. For example, in contrast to the earlier 2011–2015 surveys, the Oku Community Reserve with its high density of gorillas was extensively and systematically covered during the 2015–2019 surveys, as were much larger portions of Kahuzi-Biega National Park. In addition, more reliable attribution of great ape nests to Grauer's gorilla rather than to sympatric chimpanzees during the last round of surveys likely played some part in a higher estimated population size. However, it is important to note that this does not represent an increase in the gorilla population since 2015, rather, the previous estimate has been adjusted.

Statistical models were also fit to the 2015–2019 survey data to investigate the relative importance of different drivers on Grauer's gorilla density distribution. The positive influence of increasing distance to roads, mines, villages, and steep slopes (representing the ease or difficulty of human access) on gorilla density distribution varied within the landscape. Generally, the results indicated that gorilla density distribution was negatively impacted in a large proportion of the landscape by these different drivers, reflecting the intensity of human influence.

Unfortunately, this study has shown that although the gorilla population in the Oku Community Reserve appears to have remained relatively stable since the mid-1990s, it has declined sharply – by 80 % – in Kahuzi-Biega National Park over the same period. This highlights the importance of the Oku Community Reserve that, together with Kahuzi-Biega National Park, is the last stronghold for Grauer's gorillas and other primates. Current community conservation projects aimed at preserving this stronghold make local communities pivotal in ensuring the long-term survival of gorillas and other wildlife in this region.

Fiona Maisels, Samantha Strindberg and Andrew Plumptre

Original article:

*Plumptre, A.J., Kirkby, A., Spira, C., Kivono, J., Mitamba, G., Ngoy, E., Nshuli, R., Strindberg, S., Maisels, F., Buckland, S., Ormsby, L., Kujirakwinja, D. (2021): Changes in Grauer's gorilla (*Gorilla beringei graueri*) and other primate populations in the Kahuzi-Biega National Park and Oku Community Reserve, the heart of Grauer's gorilla global range. American Journal of Primatology 68 (7), e23288*

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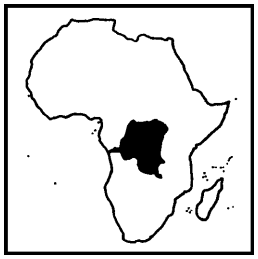

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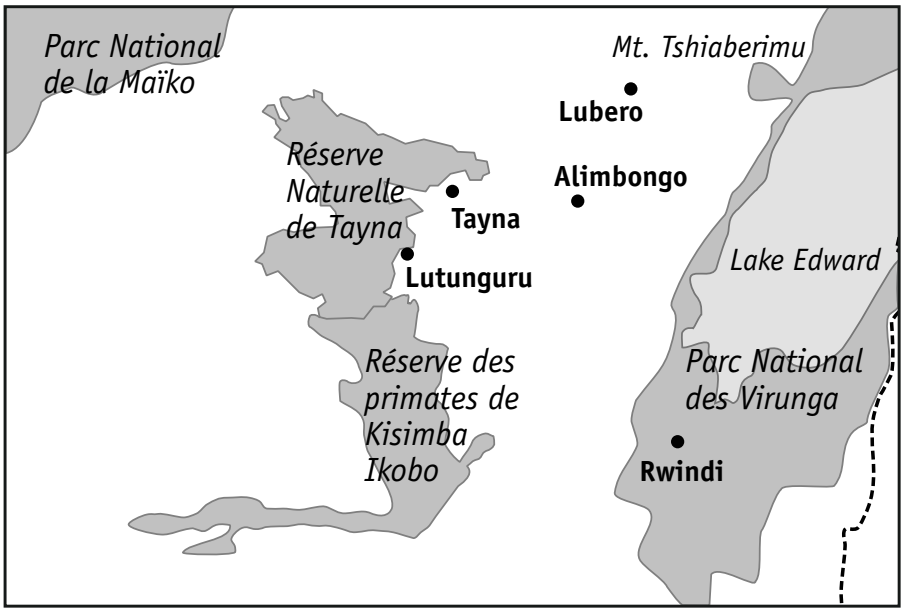
Great Ape Survey in Tayna Nature Reserve

This year, GRACE completed the first-ever great ape survey of the entire Tayna Nature Reserve, in eastern Democratic Republic of the Congo (DRC). How did GRACE achieve this? Not alone. Success meant working hand-in-hand with local communities, including:

– community meetings to build consensus,
– a signed commitment to solve problems that might arise,
– and the hard work of field teams hired and trained from nearby villages.



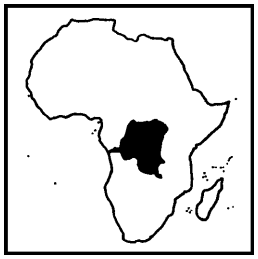
Baraza members and RGT staff with GRACE D. R. Congo Director (third from left) at the community meeting to announce the start of the survey
Photo: GRACE

The Tayna Nature Reserve is situated within a transition zone between the lowland forests of the Congo Basin to the west and the highlands of the Albertine Rift to the east. The undulating terrain ranges from 850 to 1,850 m in altitude. In addition to Grauer's gorillas, Tayna is home to eastern chimpanzees, pangolins, leopards, and many species found only in this area of the world; the Albertine Rift biodiversity hotspot, an important area in the region for species diversity and endemism. It is also an important upland water shed, regulating water flows in the region.

In the lead up to the fieldwork for the survey, GRACE used satellite imagery to assess the state of the forest habitat within Tayna. This revealed relatively intact forest within the reserve boundaries, with a 1.57 % forest loss between 2000 and 2018, but also extensive deforestation in the more highly populated areas to the east of the reserve.

A Reserve Created and Managed by the Community

Tayna Nature Reserve was created from land donated by community members. Unlike a national park managed by the government, it is managed by the



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GRACE D. R. Congo Director Jackson Kabuyaya Mbeke practices field skills in the forest near GRACE

Photo: GRACE

community. Beginning in the late 1990s, traditional and community leaders led an effort to protect the Tayna area. Their goal was to prevent the loss of local forests, wildlife, and sacred cultural sites to commercial cattle ranchers and agricultural settlements that were creeping westward.

Despite war in eastern DRC in the late 1990s and early 2000s, community leaders kept the idea of the reserve alive. In 2001, 21 Barazas (families of traditional landowners) donated land to create the reserve. A local association, La Réserve des Gorilles de Tayna (RGT), was created to manage the reserve. In 2006, the land was officially declared the Tayna Nature Reserve by DR Congo's government. It was now completely protected under Congolese law.

Today, GRACE (Gorilla Rehabilitation and Conservation Education) is the only international conservation NGO active in the Tayna area. Working in this remote area comes with challenges, including insecurity and disease outbreaks. While the GRACE sanctuary is dedicated to caring for orphaned Grauer's gorillas, GRACE has taken an active approach in protecting gorillas and their habitat. We do this through conservation education in local communities. Over the years, GRACE has built strong ties with local communities and traditional leaders. As a result, GRACE has become a trusted and valued partner. This history gives GRACE a unique insight into the challenges and opportunities for conservation in the region. Insight that was critical during the great ape survey.

Community Meeting to Start the Survey

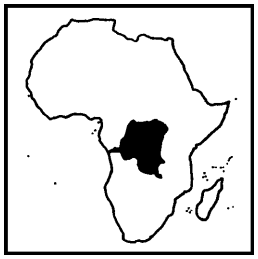
For the survey to be successful, open communication and close involvement of local communities were essential. To kick off this collaboration, GRACE and RGT – the management team for the reserve, elected by locals – convened a formal community meeting. The meeting included:

– traditional leaders of the two chiefdoms,
– other local leaders including the elected representatives of the 21 Baraza who donated land to create the reserve,
– GRACE's DRC Director,
– the administrator of the Lubero Territory where the reserve is located,
– and RGT, the reserve's management team.

During the meeting, GRACE DRC Director Jackson Kabuyaya Mbeke presented plans for the survey. Furthermore, he outlined steps for GRACE to train and hire 25 community members for the research. At the end of the meeting, all participants signed a statement agreeing to the terms of the project and pledging their support for the survey.

Just weeks after the community meeting, the World Health Organization declared the novel coronavirus outbreak a global pandemic. Survey plans called for GRACE Science Advisor Damien Caillaud to visit GRACE in May 2020 to train survey field teams. With travel shut down, this was no longer possible.

Fear grew that delaying the survey any longer might result in the community abandoning the project and disengaging from conservation. The survey would be the first major conservation project in nearly a decade. It would also be the first return of financial support for conservation in a poverty-stricken area.



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Field team members collect fecal samples at a nest site.

Photo: GRACE

Rather than risk the project falling apart, GRACE and partners pivoted to remote training of the field teams – with training videos and a 15-day training of 5 field teams.

Tayna is a remote and heavily forested area with no roadways. Teams travelled on foot through the rugged terrain. Supplies had to be carried in and out by porters, up steep hills and across rivers. In addition, strict COVID protocols meant team members could not return home to their families until the survey was finished. With no cell or radio communication also being possible, the teams were truly on their own in the forest.

The five survey teams covering the 900 km^2 reserve used a modified "fast transect" method. Throughout the survey, teams also collected data about human activities using the same methods. These included snares and other traps, gun shells, and signs of logging and cultivation.

Any time survey teams found fresh (< 3 days old) gorilla dung, they collected a sample following standard biomaterial protocols. Over time, and with continued monitoring, these samples will help build genetic profiles of the individual gorillas within Tayna.

The Good News: Great Apes Survive

The great ape survey took 70 days to complete, with 5 teams each with one team leader, 4 trackers and additional porters and cooks. In that time, teams found:

- 41 nest sites from < 3 days to 5 months old
- 305 gorilla nests
- 280 chimpanzee nests
- 62 % of gorilla nests and 85 % of chimpanzee nests in trees
- 61 gorilla faecal samples collected for analysis
- 25 signs of additional animals identified (including at least 5 species of monkeys, pangolin, forest buffalo, African grey parrot, leopard, a single Okapi footprint and more!)

The survey pulled back the curtain on Tayna's great ape populations. It confirmed that Grauer's gorillas and eastern chimpanzees still survive in Tayna.

Baraza members and RGT staff with GRACE DRC Director (third from left) at the community meeting to announce the start the survey.

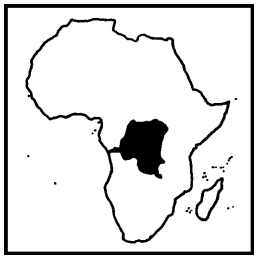
The survey was a milestone for community-led conservation in Tayna. The participatory consultation process with local community members was essential for success. So was the engagement and extensive training of local community members to lead field data collection. The future for conservation in Tayna is brighter now. That's because the survey created a large team of trained community members capable of furthering conservation and gorilla monitoring initiatives.

Gorillas are Still in Crisis

The great ape survey confirmed that Grauer's gorillas and eastern chimpanzees have not disappeared from Tayna. But it also identified ongoing threats to their populations, including mining, hunting, and cultivation.

People living in this area are among the poorest in the world. Many depend on subsistence agriculture. They depend on the forest and its resources for their livelihoods. Continued human population growth and pressures from urban areas to the east risk exacerbating this problem. And the economic impact of the Ebola outbreak (2018–2020) – which came 15 km close to GRACE – and COVID-19 only add to the dangers.

At the same time, the community is the reason Tayna Nature Reserve exists in the first place. And the great ape survey makes clear that the communi-



D. R. CONGO

Grauer's gorilla at GRACE
Photo: Deni Béchard

ty can accomplish major conservation feats if they are supported.

GRACE is now working to re-establish ongoing gorilla monitoring efforts in the reserve. We continue to work with the Tayna community leaders to build capacity. The great ape survey is a major achievement to celebrate. But together, we need to continue to support community-led conservation of Tayna to protect gorillas, chimpanzees, and their forest home in one of the most biologically diverse areas on the planet.

Summary of the GRACE blog and report

Report:
*Fawcett, K. & Kabuyaya Mbeke, J. (2021): Survey of Great Apes (*Gorilla beringei graueri*,* Pan troglodytes schweinfurthii*) in Tayna Nature Reserve, Eastern DR Congo. Unpublished report, Gorilla Rehabilitation and Conservation Education (GRACE) Center*

Blog:
https://gracegorillas.org/2021/07/02/great-ape-survey-tayna-nature-reserve/

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BirdLife International (2012): Eastern Afromontane Biodiversity Hotspot. Ecosystem Profile for the Critical Ecosystem Partnership Fund

About GRACE

Gorilla Rehabilitation and Conservation Education (GRACE) Center is an NGO that operates the sanctuary for Grauer's gorillas in Eastern Democratic Republic of the Congo (DRC). The largest primate in the world, Grauer's gorillas only live in war-torn eastern DRC. GRACE cares for 14 orphaned gorillas rescued from poachers and works to rehabilitate them so they can one day return to the wild. At GRACE, the gorillas live in a single gorilla group that functions as a surrogate family and spend their days in protected forest habitats. GRACE also leads field research and partners with local communities on education and conservation initiatives to protect a critical population of wild gorillas living in Tayna Nature Reserve. For more about GRACE, visit gracegorillas.org.

Conservation and Management of the Itombwe Nature Reserve: Major Challenges

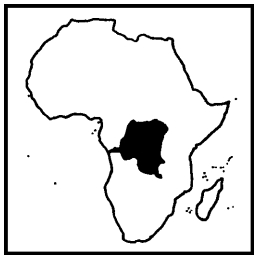
The Itombwe Nature Reserve (INR) is located in the eastern part of the Democratic Republic of the Congo in the province of South Kivu, west of Lake Tanganyika, in the Itombwe Massif. It is covered by a large tract of mountain forest. The existence of the INR and the recognition of its boundaries are governed by several documents, including Decree No. 01/008/CAB/GP-SK/98 of 25 February 1998 on measures for the protection of the fauna and flora of the Itombwe mountains, Ministerial Order No. 038/CAB/MIN/ECNEF/2006, which established the reserve, and Ministerial Order No. 16/026/GP/SK of 20 June 2016, which formalised the reserve boundaries, enclosing an estimated 5,732 km^2 (see also Gorilla Journal 57, December 2016).

The boundaries of the INR are quite clear-cut and do not cause much conflict with the local communities. 95 % of the boundaries are natural, mostly following watercourses. Half of the remainder has been marked with signs; only 2.5 % remain to be marked, requiring 59 signs.

The INR is subdivided into three management zones: an integral conservation zone, a buffer zone and a multiple-use zone.

The INR's administrative centre is a rented office in Mwenga. The INR is divided into 5 sectors, but only 2 sectors have a ranger post: the Mulambozi sector has a ranger post in the village of Kalundu and the Ulindi sector has a post in Kakolelwa. The other sectors, Elila, Mwana and Kiboyoka have no ranger posts or staff. PACEBCo built a multifunctional centre for the INR in Kamituga. It cost US$ 299,183.90, but ICCN has made no visible effort to manage it and it has since been abandoned.

The aim of the management of the INR is "participatory protection of the physical integrity of the INR in order to conserve its biodiversity, its ecosystem services and its cultural and socio-economic values while respecting gender dimensions and the rights of local residents and indigenous peoples, for the benefit of the local, national and international community."



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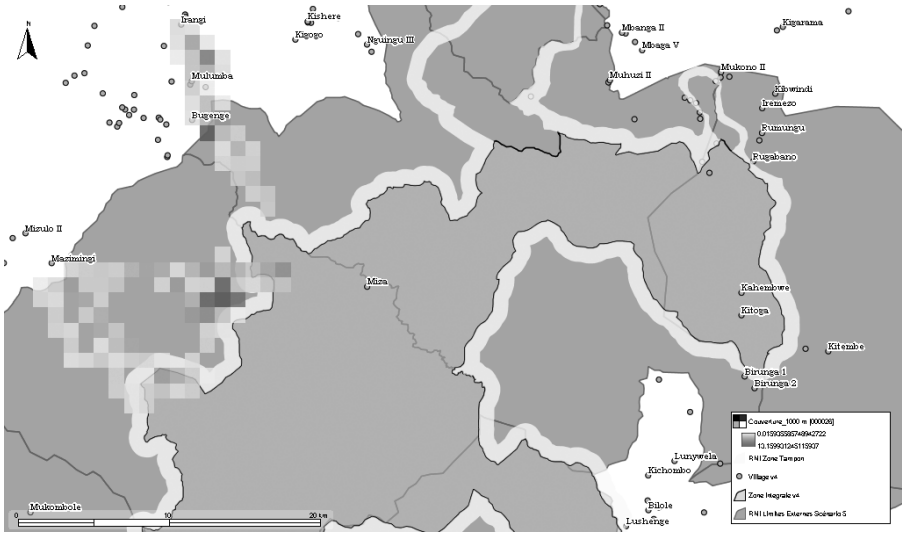


Distribution of patrols in Itombwe in the first half of 2021

Map: ICCN RNI

Staff

The INR has a staff of 42. Of these, 23 are registered, i.e. they have a contract with the State. Of these 42 staff members, 28 are technical staff who work in the field, one is a scientist and 13 work in administration.

Monitoring

The low number of technical staff makes it impossible to patrol the entire reserve. Only parts of two sectors (Mulambozi and Ulindi) are monitored, particularly the multiple-use zone. During the first half of the year, only seven patrols were deployed, covering 6.7 % of the reserve. This low number of patrols is due to the lack of patrol food rations, field equipment and also to the reduced number of technical staff. Patrols during the first half of the year covered 0.36 % of the fully protected zone.

At the start of the second half year, in August and September, four patrols were conducted in the Mulambozi and Elila sectors. These four patrols covered 3.5 % of the total area of the reserve – 1.1 % were in the fully protected zone. This is an area where many illegal activities are observed, such as hunting with dogs and 12-gauge weapons, traps set by people digging for minerals, and several cassiterite quarries.

Challenges

The management of the Itombwe Nature Reserve remains a challenge and deserves the attention of the international conservation comsmunity. Although placed under the management of the ICCN, protection and conservation remain unrealistic goals. According to international conservation standards, if all conditions are met (appropriate equipment, food and medical care) an eco-guard should be able to monitor an area of 15 km^2. The Itombwe Reserve is far from these numbers and this reality. The INR's 28 technical staff include curators and one deputy director. This means that the reserve actually has 25 eco-guards, with the capacity to monitor 375 km^2, which is 6.54 % of the reserve's total area of 5,732 km^2.

Note also that these eco-guards currently receive neither equipment, nor food while on patrol, nor health care from the Government. The meagre salary that a portion of the workforce receives may not even be enough to keep the staff working in the field. The INR has an old vehicle that cannot fulfil all its tasks in the reserve. Its maintenance costs are exorbitant and exceed the means of the reserve.

Two organisations currently support the INR directly. Berggorilla & Regenwald Direkthilfe provides the rent for the Mwenga office and gives bonuses in order to improve the life of the eco-guards and to allow them to remain in the field. The Gorilla Organization provides additional bonuses and occasionally funds for food while on patrol. Local and national organisations facilitate sensitisation, socio-economic surveys, the training of community guards, participatory demarcation and development projects.

The Government is requested to implement the following six actions in order to improve the management of the reserve:

- increase the technical staff of the reserve by 200
- provide staff with salaries, food while on patrol and field equipment
- solicit additional support from partners for bonuses, food while on patrol and field equipment
- utilise trained community guards (currently more than 120 persons) to conduct patrols
- construct ranger posts in those sectors that do not already have them
- solicit support from partners to finish participatory demarcation of the reserve

Germaine Buhendwa and Claude Sikubwabo

COVID-19

Bushmeat and COVID-19; What Is the Connection?

The Simple Connection: Emerging Zoonotic Diseases and Human Health

'Bushmeat' is a term used to refer to wild meat in Africa, where forests are referred to as 'the bush' and hence meat from the forests as 'bushmeat'. The terms 'bushmeat' and 'wild meat' or 'game meat' are therefore synonymous. Wildlife has long been relied upon for subsistence-level protein needs and every country has a long history of humans eating game or wild meats. In the present day, more developed countries enforce strict laws and regulations that limit the number of individuals hunted and harvested. Wild populations of game animals are closely monitored and wild meats are consumed with the sustainability of vulnerable animal populations in mind.

Food safety laws are also in place that follow guidelines overseeing hygienic handling, movement, and sales of meats. For example, in the EU, laws prohibiting the unregulated import of meats from third countries are a safeguard against the introduction of livestock diseases such as anthrax, tuberculosis, and many others that could threaten food security and human health if introduced to a country where these diseases are controlled or have been eradicated. However, in many less developed countries, biological monitoring systems to evaluate vulnerable populations of species are absent or not effective and laws to protect wildlife and food security, even when present, are not strictly enforced. For example, in West and Central African countries, meats are often sold in open markets, which have low hygiene standards and very little monitoring or controls of meats in place. Protected wildlife is openly sold with little fear of reprisal as enforcement of laws protecting wildlife is lax. The unsanitary conditions found in African markets are true of markets in other countries, including Asia, where COVID-19 is thought to have originated.

In a typical market in the Nigeria-Cameroon region, bushmeat is sold alongside domestic meats, other food items, and various goods. Hygiene standards are often very low. Animals are presented and prepared for sale, often in the open and without any rules or regulations, next to food items and other goods, trash, dirty water, and detritus.

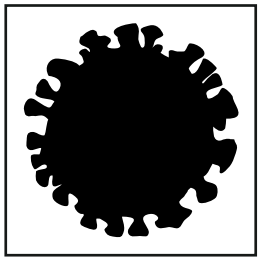
Photo: Tengwood Organization

Coronaviruses are common worldwide and are present in a variety of species, causing respiratory, intestinal, hepatic or neurological symptoms that vary in severity. However, while viruses may make a host sick, they do not necessarily kill it; a good example is the common cold virus in humans. If a given virus killed every animal it encountered, it would be a very unsuccessful virus indeed – there would be no living creature left to carry it to the next individual.

Many animals co-evolve with viruses over centuries. After time, some viruses are even carried and passed along with only mild or inapparent symptoms and little sickness at all. However, when a virus which has been co-existing with one species suddenly has an opportunity to infect a new type of species it has never encountered before, it may act very differently in its new host; this is the theory behind COVID-19 in humans. Over time, in a new host, a virus may even mutate into a new form.

'Wet market' is a term used to describe markets where animals are being butchered and offered fresh for sales. Typically, living and dead animals are often found side by side in these types of markets; wild animals that would never encounter one another in nature often do. Wild animals, domestic animals, and humans are often thrown together into a dangerous mix. In the case of 'wet' markets, where animals are stressed and over-crowded, and humans are being exposed to blood and body fluids during the butchering process, conditions are perfect for a virus to jump to a new host.

Deforestation is another method in which viruses that have rarely been disturbed in their natural environment are exposed to humans. There are a number of newly emerging zoonotic diseases of particular concern that have



COVID-19

recently made the jump from animals to humans, including swine flu, bird flu, SARS, MERS, and Ebola, all thought to be the result of species that would not encounter one another in nature meeting in a novel setting, such as a newly opened forest or a marketplace. Any country where wild areas are being destroyed and where these types of markets exist, is one in where the issue of wild meat is of concern.

COVID's Additional Impact on Bushmeat and Wildlife Conservation

In Africa and other less-developed, poverty-stricken regions which still have large natural areas, COVID-19 is beginning to take an additional toll on vulnerable wildlife. Outside of vaccination, the measures to control COVID-19 are similar to those that were used to control Ebola outbreaks; this includes nothing more than simple germ-avoidance techniques such as hand washing, social distancing, the use of masks and restriction of movement.

This worldwide restriction on movement has had an unexpected impact on conservation. For example, it has greatly reduced tourism in Africa. In places like Kenya and other African countries where tourism is well established and brings in substantial revenue, lack of travel has resulted in serious losses to the tourism industry, which includes loss of income for locals. As a result, Kenya has seen a surge in poaching that reflects this economic slump. This decrease in tourism and economic hardship has resulted in an increase in hunting as well as wildlife trafficking.

In other African countries such as Nigeria, which do not yet have an established tourism infrastructure, COVID has still had a substantial impact on the economy and livelihoods. Measures to control the pandemic have included increasing restrictions on the movement of goods, people and trade; many markets had to reduce their days of sales. While this limited the ability of bushmeat traders to buy meats from hunters and travel with them to more urban markets, therefore reducing sales, these restrictions also impacted humans in those areas where they live closest to nature. Restrictions on the movement of foodstuffs and travel have resulted in sharp increases in food prices coupled with losses in income. Those living near forests and other wild areas are now depending more heavily on natural food resources as a less expensive subsistence-level alternative.

What Happens Next: Lessons from Ebola in the Nigeria-Cameroon Region

The 2014 outbreak of Ebola in West Africa is a good case study for what is likely to happen once COVID-19 restrictions are lifted. During the outbreak, bushmeat bans were put in place that restricted sales of bushmeat. However, after the bans were lifted, the volume of trade gradually returned to normal.

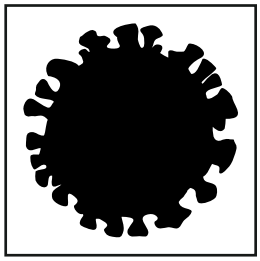
A study of bushmeat traders and markets in Nigeria was carried out by the Tengwood Organization from 2016–2018 and data collection began not long after sales had begun to 'normalise'. Our study followed 73 bushmeat traders in 19 urban and rural marketplaces across Benue State and Abuja Capital Territories to determine a number of aspects of the trade, with our focus on the movement of bushmeat in markets (unpublished data).

For the majority of market traders (94 %), bushmeat trading was their livelihood and also a family business, one they had inherited, with a number of relatives working together over a span of generations. Interviews with these traders and their customers showed that many felt that animals are still plentiful in the forest and the majority of traders and their customers preferred the taste of bushmeat, with 80 % claiming that it is healthier for the body than domestic meats. Recent studies during the COVID pandemic have looked at the attitude of Nigerians and nearby Cameroonians toward bushmeat consumption and reveal a similar mindset; wild meat is a taste preference and considered healthier than other types of meat.

A mix of meats is typical of the Nigerian bushmeat markets Tengwood studied. Piled together are red river hog (head), assorted monkeys, other large and small mammals, and lizards.

Photo: Tengwood Organization

During the 2014 Ebola outbreak, public health campaigns designed to discourage wild meat consumption were largely ineffective because they contradicted the experience of people who have eaten bushmeat for years without consequences.



COVID-19

The Cross-Sanaga Region of Nigeria and Cameroon contains the entirety of the habitat of three very vulnerable primates: the Cross River gorilla (*Gorilla gorilla diehli*), the Nigeria-Cameroon chimpanzee (*Pan troglodytes ellioti*), and the drill monkey (*Mandrillus leucophaeus*), making the pandemic a situation that is critical for conservation efforts for these and other species in the region. Both chimpanzee and drill meat were found openly sold in some markets during Tengwood's study and other primates were commonly sold on a daily basis in all of the markets we studied. Similar to the Ebola outbreak, it is highly likely that as restrictions on travel are lifted, the market sales of bushmeat will return to former numbers. It is also likely that economic losses incurred during the pandemic will not resolve quickly and people will continue to utilize bushmeat to meet protein needs.

Complicating conservation efforts, the global impact of the pandemic on travel, jobs and livelihoods has resulted in even conservation organisations struggling to function and fund themselves in the sagging economic climate and the difficulties of travel. Of further concern, primates have proven susceptible to contracting COVID-19 from humans; a number of western lowland gorillas at Zoo Atlanta, Prague Zoo and San Diego Zoo recently tested positive for COVID-19, likely having contracted it from human caretakers. Transmission of COVID-19 to wild primate populations becomes a very real possibility in regions with vulnerable populations of primates.

Beyond Africa: Bushmeat and Emerging Zoonoses Are a Global Problem

For people living near wild areas, wild animals are an irresistible economic resource – they are often easily obtained and can bring in revenue when sold to traders or middlemen, who then carry wildlife and their products to urban areas and beyond. Before COVID, wild meat and many other wildlife products were being smuggled worldwide for easy profits. A study by Tengwood Organization in 2012 documented bushmeat confiscations in Swiss airports (see Gorilla Journal 48, June 2014). While much of the bushmeat confiscated by Customs agents was smoked or cooked, 36 % was fresh, bloody meat, slated for the European table – a perfect scenario for disease transmission.

What has happened with one virus could happen with another. There is evidence that the illegal trade in wildlife and wildlife products, while impacted by the drop in air travel, has not necessarily slowed down during the pandemic. A recent report looking at illegal trafficking in ivory and pangolin scales shows an increase as other routes of transport, such as cargo ships, are utilized.

In the earliest days of the global pandemic lockdowns, many people thought COVID-19 had a positive impact on wildlife. Feel good stories emerged on social media showing wildlife beginning to thrive without the presence of humans – as once busy areas turned quiet, wild animals began to emerge in places suddenly devoid of humanity. However, the reality of the situation for wildlife has evolved far away from this utopian ideal. Following the initial period of quiet, people have increasingly struggled as the global pandemic continues. Not surprisingly, this struggle is putting many vulnerable species at higher risk.

With the current global pandemic overwhelming economic resources, the issue of bushmeat consumption has largely been relegated to a waiting position on the sidelines of this crisis, despite the fact that issues surrounding wildlife trafficking and wild meat consumption are at the core of this pandemic. As travel and other types of COVID-19 restrictions lift and the

"Monkey" was one of the most popular types of bushmeat during our study of Nigerian markets. While some traders were aware of laws and hid protected species under the table, others displayed them without fear of reprisal. Despite many traders only identifying 'monkey' to the species level, the most common bushmeat were species of long-tailed monkeys. Also identified were pottos, baboons, drills, and chimpanzees.

Photo: Tengwood Organization

Bushmeat seized during Tengwood's 2012 study in Swiss airports: the majority of wild meats came smoked or cooked, but in other cases, bloody carcasses or pieces were discovered in passenger luggage, such as a* Cercopithecus *monkey, Pangolin, African brush-tailed porcupines and cane rat. Some traders in Nigeria and Cameroon admitted to saving scales from pangolins for Chinese buyers who came to the market on a weekly basis to buy these scales for export to Asian countries.

Photo: Tengwood Organization

world begins to return to "normal" for humans, the situation for wildlife becomes even more dire. Wildlife trafficking and the desire to eat wild meat remain at the centre of the problem.

Kathy L. Wood and Bruno Tenger

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Predicting Range Shifts of African Apes and Effectiveness of Protected Areas under Global Change Scenarios

Given a burgeoning human population and rapidly-growing global demand for natural resources, reconciling biodiversity conservation and human-related activities is a fundamental challenge. Tropical forests support at least two-thirds of the world's biodiversity, providing important ecosystem services at both global and local scales. However, a decline of 3 % in global forest cover was reported between 2010 and 2015, with the highest rates of land-use change and degradation found in the tropics, where deforestation rates exceeded five million hectares per year. Africa had an annual rate of net forest loss at 3.9 million hectares between 2010 and 2020, and has up to 400 million hectares of forest that could potentially be used for agricultural expansion. Therefore, continued widespread expansion of agriculture is likely. Moreover, the African continent is the most vulnerable to the effects of climate change, and future droughts, floods and other extreme weather events will lead to the expansion of agriculture into more humid tropical areas. These areas are where great apes live and are generally high in biodiversity.

Great apes (bonobos, chimpanzees, gorillas and orangutans) are flagship species in tropical forest ecosystems, hence, their protection indirectly benefits biodiversity in general, and their conservation importance cannot be overstated. Despite showing behavioural flexibility and adaptation to human-modified habitats, African apes are declining at annual rates of 2 %–7 % due to several anthropogenic threats. This is reflected in their IUCN Red List classification of (Critically) Endangered Species. Drivers including habitat loss, hunting, infectious disease epidemics, large-scale commercial logging and industrial agriculture are directly contributing to their decline, while others, such as human population growth and increased per capita demand, do so indirectly. These drivers have led to a considerable reduction in the suitable environmental conditions for great apes.

While all the aforementioned are important drivers of African ape decline, ongoing climate change is a delocalised, multi-faceted driver, likely to contribute to many of these threats. A

recent study revealed that future extreme warming could be dramatic for primates and, despite highly taxon-specific responses, African apes could face regional extinction within their current distribution. However, in general, how future climate change will affect African apes and their habitats remains largely unexplored.

Most African ape populations occur outside protected areas. Even under growing land-use pressure, some legally-protected areas in the tropics have been effective in protecting biodiversity and ecosystems, promoting connectivity, and making a significant contribution to long-term biodiversity conservation. However, many are experiencing biodiversity loss due to the synergistic effects of habitat disruption, hunting, and forest-product exploitation. Importantly, many protected areas will not be exempt from climate change, and consequently inadequate for ensuring the long-term conservation of African apes.

Study Aims

Climate change, land-use change, and human population change are key drivers of global biodiversity decline that are likely to severely impact great apes through range reductions and loss of suitable habitat. Based on an ensemble forecasting approach, a recent study by Carvalho et al. (2021) published in Diversity and Distributions used the most comprehensive database available on ape distribution, the IUCN SSC Ape Populations, Environments and Surveys database (A.P.E.S.), to assess the synergistic effects of climate, land-use, and human population changes on great apes and their habitats by 2050. This included a best- and worst-case scenario for unprotected areas (outside protected areas only, assuming complete management effectiveness of protected areas and consequently complete range stability within protected areas), and for the entire study region.

What Is the Expected Change in Range Size for African Apes by 2050?

Differences in range loss and gain are expected to occur across the African apes' distribution by 2050, but on average under both future scenarios, massive range loss is predicted irrespective of whether only the unprotected portion of the range is considered or the entire range. However, fairly limited range gain is expected if African apes can disperse to new suitable areas, both in areas currently unprotected or across the entire range.

How about the Gorillas' Future Distribution?

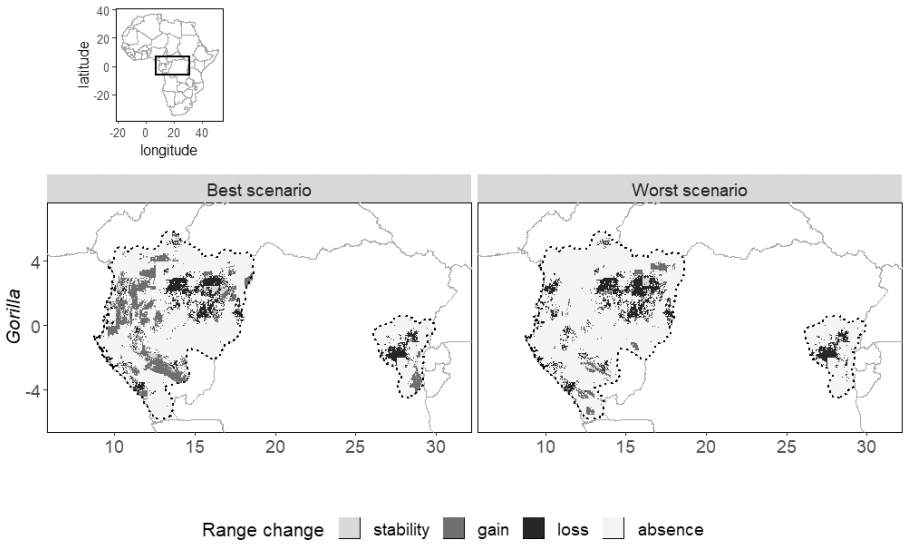
We do not describe results regarding range change for mountain and Cross River gorillas given the extreme range loss likely due to their narrow distribution and the coarse resolution of the environmental variables. Grauer's gorillas are predicted to lose three quarters of their range under both future scenarios, with most range loss expected when the entire region is considered. Range gain is likely only inside protected areas under the best-case scenario (i.e., 46 %). According to both future scenarios, more than half the western lowland gorilla's unprotected range is expected to be lost, and most of the species range is likely to disappear if the entire study region is considered. In contrast, substantial range increases in unprotected areas are predicted, with a slight increase if the whole study region is considered.

Results of the predicted change (%) in African ape ranges, assuming either range loss and range gain, for unprotected areas and for the entire study region, by 2050 under the best- and the worst-case scenario.

	Range loss				Range gain			
	Unprotected areas		Entire region		Unprotected areas		Entire region	
	Best	Worst	Best	Worst	Best	Worst	Best	Worst
All species	50	61	85	94	52	21	66	24
Gorilla beringei graueri	71	74	94	100	–	–	46	–
Gorilla gorilla gorilla	46	61	78	93	114	17	124	27

Conclusions

This is the first study that has combined climate, land-use and human population changes to predict taxon-specific distributions of African apes. Massive habitat decline is expected by 2050, and range gain is uncertain as African apes will not be able to occupy new areas immediately due to their limited dispersal capacity, migration lag and ecological constraints. The 30-year time frame considered in this study is a bit longer than a gorilla generation length and it is unlikely that migration into new areas during this time could occur to any great extent. It is therefore very important that these results are not interpreted as indicating that range gain will occur because effective protection of new suitable areas will first need to be ensured for a great ape population to shift into such habitat. Importantly, massive range loss can be anticipated in the next 30 years given the 2 %–7 % of annual population decline previously estimated for great apes. Thus, our study provides policy makers with compelling arguments for working towards aligning biodiversity



Ensemble forecasting of the future (best- and worst-case scenarios) range change for* Gorilla gorilla gorilla *(left) and* Gorilla beringei graueri *(right) within the respective entire study region.

Figure: Joana Carvalho et al.

conservation both inside and outside protected areas under projected climate change.

Conservation Implications

For great apes to disperse to new climatically-suitable areas and to prevent irreversible losses across current suitable habitats over the long term, taxon-specific conservation planning should focus on existing and proposed protected areas, the creation and/or management of which can be informed by these habitat suitability models. Thus, for conservation efforts to be effective, it is imperative to:

– Include climate change impacts on the great ape conservation agenda.
– Ensure connectivity between suitable habitats (e. g. United Nations REDD+, small-scale agroforestry), and establish responsible forest management planning (e.g. as currently practiced in logging concessions under Forest Stewardship Council standards).
– Reconsider our personal consumption habits and lifestyles. Living a low carbon and plastic-free lifestyle, adopting low environmental impact diets (such as a plant-based diet) and having smaller families are lifestyle choices that can help reduce greenhouse gas emissions and which consequently will minimise our impact on biodiversity in general.

Joana S. Carvalho, Bruce Graham, Fiona Maisels, Elizabeth A. Williamson, Serge Wich, Tenekwetche Sop and Hjalmar S. Kühl

Original publication:

Carvalho, J. S., Graham, B., Bocksberger, G., Maisels, F., Williamson, E. A., Wich, S., Sop, T., Amarasekaran, B., Barca, B., Barrie, A., Bergl, R. A., Boesch, C., Boesch, H., Brncic, T. M., Buys, B., Chancellor, R., Danquah, E., Doumbé, O. A., Le-Duc, S. Y., Galat-Luong, A., Ganas, J., Gatti, S., Ghiurghi, A., Goedmakers, A., Granier, N., Hakizimana, D., Haurez, B., Head, J., Herbinger, I., Hillers, A., Jones, S., Junker, J., Maputla, N., Manasseh, E.-N., McCarthy, M. S., Molokwu-Odozi, M., Morgan, B. J., Nakashima, Y., N'Goran, P. K., Nixon, S., Nkembi, L., Normand, E., Nzooh, L. D. Z., Olson, S. H., Payne, L., Petre, C.-A., Piel, A. K., Pintea, L., Plumptre, A. J., Rundus, A., Serckx, A., Stewart, F. A., Sunderland-Groves, J., Tagg, N., Todd, A., Vosper, A., Wenceslau, J. F. C., Wessling, E. G., Willie, J., Kühl, H. S. (2021) Predicting range shifts of African apes under global change scenarios. Diversity and Distributions 27 (9), 1663–1679 https://onlinelibrary.wiley.com/doi/10.1111/ddi.13358

Lethal Coalitionary Attacks of Chimpanzees on Gorillas in Loango National Park, Gabon

In 2019, in Loango National Park, Gabon, we observed two lethal coalitionary attacks by chimpanzees on gorillas, with each attack lasting approximatly an hour and involving tactile threats, coalitionary displays and physical attacks from chimpanzees towards gorillas. During these encounters the gorillas counter attacked and defended themselves using contact aggressions and displays. These attacks were unlike previous interactions observed between the two sympatric apes and ultimatly resulted in the death of two gorilla infants. I will describe the Loango field site, summarise the two encounters and discuss our hypotheses on why these events took place.

Loango National Park

Loango National Park is a safe haven for numerous endangered species, including two of the African great apes, the central chimpanzee (*Pan troglodytes troglodytes*) and the western lowland gorilla (*Gorilla gorilla gorilla*). In addition to sites like

Goualougo/Mondika (Morgen & Sanz 2006), Nouabalé-Ndoki (Kuroda et al. 1996), in the Republic of Congo or Lopé (Tutin & Fernandez 1993; Tutin et al. 1991) also in Gabon, Loango is one of the sites across tropical Africa where these two species share the same resources and where there is the chance to directly study their unique sympatric adaptations. Loango is also diverse in terms of habitat; the Ozouga study site comprises a mosaic of different habitat types including coastal forests and savannah in the west, multiple lowland swamps fed by a lagoon in the east, and heterogeneous tropical rainforest throughout.

The Ozouga research site, located in the northern sector of the park, was founded in 2005 and in 2017 we began systematic focal behavioural data collection with the Rekambo community of chimpanzees. During our daily field work with the chimpanzees, contact with gorillas is mostly indirect and in the form of imprints in the mud and left-over traces of food at feeding patches. Prior to 2019 in the rare times that we had observed interactions between chimpanzees and gorillas, they were considered as relatively relaxed, and we had even observed two encounters where both species fed peacefully in foraging trees.

Chimpanzees on patrol looking for other great apes *Photo: Lara Southern*

The Encounters

The two lethal encounters of 2019 were significantly different to all interactions we had previously observed between the two sympatric species. The first encounter took place on 6 February 2019, when 27 members of the Rekambo community went on a deep intrusion patrol in the neighbouring chimpanzee territory. This group was followed by a research team comprised of four observers. The patrol lasted several hours and it was late afternoon when the Rekambo chimpanzees re-entered their territory after not encountering another chimpanzee community. It was here, in a large dense thicket that the encounter with the gorilla group took place.

The first indication that something was wrong was a loud high-pitched scream of a chimpanzee followed by a series of chimpanzee barks. Only a few seconds later the entire area became a cacophony of noise, and it was then that we heard chest beats – a characteristic display for gorillas – and realised that the chimpanzees had encountered a group of gorillas. This first encounter lasted about an hour (in which we could still hear the silverback's chest beats) and involved several male chimpanzees and adult females jumping on and hitting the large silverback. The silverback retaliated and one adolescent female chimpanzee was severely injured when she was knocked backwards after a charge. In the commotion the chimpanzees were able to capture an infant gorilla who eventually died after being roughly handled and played with by the younger chimps. The encounter ended with the gorilla group's ultimate retreat.

The second event took place in December 2019, just ten months after the first lethal encounter. A large party of chimpanzees were on the outskirts of their territory and a patrol into the neighbouring northern community's territory seemed imminent. A team of observers were following an adult male, Freddy, who suddenly stopped, became pilo-erect, and produced alarm barks whilst scanning the distance towards the edge of a swamp. The observers then saw movement in a large tree in the distance and identified an adult female gorilla in the canopy. Several chimpanzees began to climb up into the tree containing the gorillas, of which there were 7 individuals.

After a few minutes at least one female gorilla and the silverback were seen fleeing, leaving two adult females and their offspring in the tree. The chimpanzees focussed on these two females and moved closer to them in the canopy, eventually driving them to the ground where they harassed them and attempted to grab the infants from their bellies. Eventually one female managed to flee with her infant, however the other female lost her infant to the chimpanzees who had surrounded her. The gorilla infant died shortly af-

Chimpanzees are not always as calm and peaceful as this one.
Photo: Lara Southern

ter its capture and had a large opening across its abdomen.

Following the capture and death of the infant, the chimpanzees lost interest in the other members of the gorilla group and soon after the chest beats of the silverback were no longer heard. An adult female chimpanzee, Roxy, retrieved the infant gorilla and carried it with her for the next three hours, periodically feeding on it. There was not much interest from the rest of the chimpanzee group, although there were a few exchanges of meat between Roxy and several low-ranking individuals.

Discussion of the Events

Several explanations may account for these lethal encounters. We have discussed our observations, and indeed continue to do so, with other primatologists and anthropologists alike. One suggested explanation may be that the observed events represent cases of predation, with the chimpanzees hunting and opportunistically targeting the smaller-bodied gorilla infants as prey. However, firstly, since the consumption of the "prey" was only observed in one case, it does not fit the purpose of hunting as a means of gaining nutritional benefits. Secondly, the behaviour observed during the two events was very different to those reported during species-typical hunting, which is characterised by the prevalence of high-ranking males as the primary prey possessors and consumers, high levels of attention, arousal and excitement of party members after a kill and the presence of begging and food sharing behaviours (Boesch & Boesch 1989; Goodall 1986; Mitani & Watts 2001).

Another potential explanation is that the two cases are the product of interspecific competition. The two lethal encounters we observed occurred at times characterised by food scarcity and a period of high dietary overlap in Loango (for fruit resources) – February and December 2019 (Head et al. 2011), while the two previously observed peaceful co-feeding events took place in April, a month characterised by relatively low dietary overlap between the two species. These high levels of competition for specific fruit species in months of low fruit availability may spur higher levels of aggression when competing over valuable resources.

Additionally, one typical aspect of many interactions driven by interspecific competition is that the outcome favours species that form groups, as in this case where the chimpanzees were at an advantage even against the larger gorilla species, given their ability to cooperate and form a coalitionary attack.

A third and final potential explanation is that at Loango, due to this relatively high dietary food overlap in specific months (Head et al. 2011), the chimpanzees perceive gorillas as competitors, for both space and resource use, similar to members of other chimpanzee communities. Both of the lethal encounters reported here showed clear similarities to behaviours observed during chimpanzee intercommunity encounters given both events took place at the beginning or end of a territorial patrol, infants were targeted and adult males were the main attackers and played the most active roles.

Ultimately, at this point we can only speculate as to why these two lethal events took place. Additional observations of interactions between chimpanzees and gorillas, in combination with isochronous assessments of fruit availability and dietary overlap, are needed to fully understand if indeed these attacks are spurred by hunting, interspecies competition or whether they are merely a non-adaptive by-product of the territorial nature of chimpanzees.

Lara M. Southern

GORILLAS

Original publication:
*Southern, L. M., Deschner, T. & Pika, S. (2021): Lethal coalitionary attacks of chimpanzees (*Pan troglodytes troglodytes*) on gorillas (*Gorilla gorilla gorilla*) in the wild. Scientific Reports 11, 14673*

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Dangerous Selfies with Gorillas

Visiting mountain gorillas is popular, and many of the visitors proudly present proof of their gorilla trekking in social media. However, to obtain impressive pictures the strict rules for gorilla visits are sometimes ignored. This presents great risks for the species' survival as airborne infections may be transmitted through natural breathing, speaking, coughing and sneezing.

In a study on the presentations of mountain gorilla visits, Gaspard Van Hamme and his team used 858 photographs posted on Instagram between 2013 and 2019. He was particularly interested in the proximity of tourists to mountain gorillas in the wild. Most of the photos (86 %) showed tourists within 4 m of the gorillas (the recommended distance is at least 7 m) and in 25 cases there was even physical contact between tourist and gorilla. These 25 tourists could have transmitted disease by the sole act of breathing. During the study period – pre-COVID-19 – face mask use was only compulsory in the Democratic Republic of the Congo (since 2009), and masks were worn by the tourists there in 65 % of the photos.

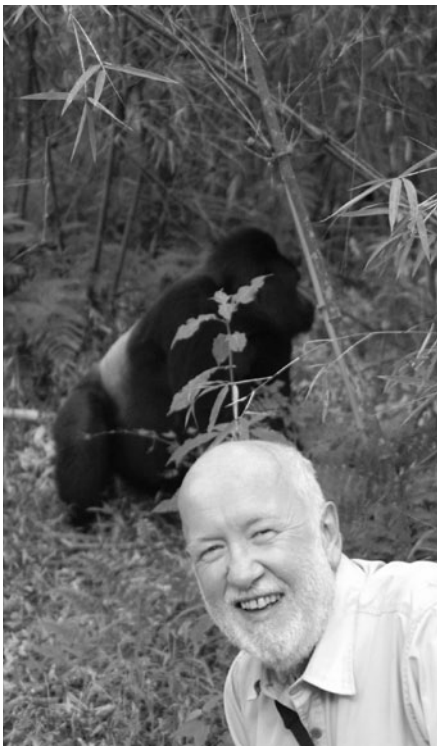
The low number of photographs showing people and gorillas with sufficient distance between them is not surprising, as these photos are less likely to be posted on Instagram. At the same time, it is not always possible to take a photograph on the spot, and thus the Instagram posts may not always show the closest proximity of an encounter.

Tourists tended to be closer to immature gorillas than to adult gorillas, and this was more pronounced in female tourists than male tourists. The mean distance between humans and wild gorillas even decreased between 2013 and 2019. The reason for the closer proximity to young gorillas may either be that immatures are more curious, which would mean that they sometimes approach humans, but also that most tourists are less afraid to approach them as opposed to the dangerous-looking adults.

The results indicate that existing rules are not being enforced despite the well-known risks of disease transmission in both directions between tourists and wildlife. The popularity of the photograph-based social media may stimulate closer contacts and influence people to engage in risky behaviours.

The authors conclude that the regulations relating to the distance between animals and tourists should be reinforced and campaigns should raise awareness regarding the risks of disease transmission; even fines for non-compliance should be considered. Surgical face masks should stay mandatory for everybody visiting the gorillas even after the COVID-19 pandemic. A paradigm shift that places the animals' interests before profit maximisation in wildlife ecotourism is crucial for both the industry and the wildlife species in question.

Summary of:
Van Hamme, G., Svensson, M. S., Morcatty, T. Q., Nekaris, K. A.-I. & Nijman, V. (2021): Keep your distance: Using Instagram posts to evaluate the risk of anthroponotic disease transmission in gorilla ecotourism. People and Nature 3 (2) 325–334

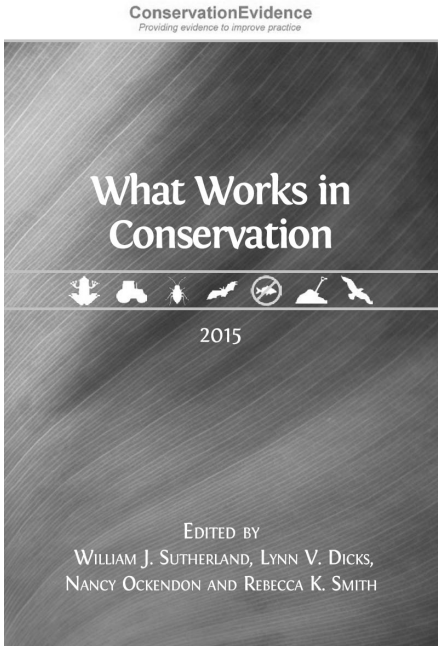


Rolf Brunner during a mountain gorilla visit maintaining the correct distance

Photo: Rolf Brunner

READING

William J. Sutherland, Lynn V. Dicks, Silviu O. Petrovan and Rebecca K. Smith (eds.)
What Works in Conservation. Open-Book Publishers 2021. 1040 pages. Paperback £ 40.95, ISBN 978-1-80064-272-0. Hardcover £ 51.95, ISBN 978-1-80064-273-7. https://www.openbookpublishers.com/product/1490



Meindert Brouwer
Central African Forests Forever. 2021. 216 pages, almost 300 photos. Semi-hard cover, euro 34.90. Available in English, Chinese and French. https://www.centralafricanforests.org/

The book mainly focuses on the use of Central African forests, mostly industrial use, but also small-scale use by local farmers.

Michela Wrong
Do Not Disturb: The Story of a Political Murder and an African Regime Gone Bad. New York (PublicAffairs) 2021. 512 pages, hardcover. ISBN 978-1-61039-842-8

James H. Smith
The Eyes of the World. Mining the Digital Age in the Eastern DR Congo. Chicago (University of Chicago Press) 2021. 360 pages. Paperback US$ 30, ISBN 978-022681606-7. Hardcover US$ 95, ISBN 978-022677435-0. PDF US$ 29.99, ISBN 978-022681605-0

New on the Internet

To Protect You and Great Apes from Disease. Education material for great ape tourists endorsed by the IUCN SSC Primate Specialist Group Section on Great Apes: http://www.protectgreatapesfromdisease.com/

WWF
Stepping Up? The continuing impact of EU consumption on nature worldwide. April 2021. 33 pages. https://www.wwf.eu/?2965416/Stepping-up-The-continuing-impact-of-EU-consumption-on-nature Download PDF (17.9 MB): https://wwfeu.awsassets.panda.org/downloads/new_stepping_up___the_continuing_impact_of_eu_consumption_on_nature_worldwide_fullreport.pdf

Médecins sans Frontières
Sexual Violence in the Democratic Republic of Congo. MSF Field Report, July 2021. 24 pages. Download PDF (7.92 MB): https://www.msf.org/sites/msf.org/files/2021-07/MSF%20DRC_SEXUAL%20VIOLENCE%20REPORT.pdf

Human Rights Watsh
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Levin Sources
Madini Project: Advocating for an improved enabling environment for the production, trade and export of OECD Due Diligence Guidance (DDG)-conformant minerals from eastern DRC. August 2021. 39 pages. Download PDF (): https://ipisresearch.be/wp-content/uploads/2021/11/202111_Madini_Final-report-OECD-conformant-supply-ENG.pdf

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The artisanal and small scale mining sector in eastern DRC six months after the Covid-19 outbreak. IPIS, March 2021. 23 pages. Download PDF (1.6 MB): https://ipisresearch.be/wp-content/uploads/2021/04/2104-insights-Lay-out-IcSP-Due-Diligence-COVID-19-DRC-final-report_v3.pdf

Global Witness
Before the Flood: The dam that threatens one of Africa's oldest national parks. December 2021. 16 pages. Download PDF (2.2 MB): https://www.globalwitness.org/documents/20224/Before_the_Flood_EN_-_December_2021.pdf

BERGGORILLA & REGENWALD DIREKTHILFE

The new board: Laura Hagemann, Burkhard Bröcker, Angela Meder

Change in the Board

The medieval town of Limburg provided the picturesque setting for the meeting, which had been postponed several times due to the pandemic. Contrary to our usual procedure, this time our general meeting took place on a single day, September 25, 2021. Association regulations do not tolerate delays. It was necessary to elect a new board, because after 11 years of intensive work, board member Peter Zwanzger was retiring, as announced some time ago. However, he will remain a valued member of our organisation.

Laura Hagemann, who holds a doctorate in biology, was elected as his successor. She already gave a lecture on the population dynamics of western lowland gorillas at the 2018 B&RD meeting in Nuremberg, which she also summarized for the Gorilla Journal.

Even though the program had to remain tight this time, 14 members came to Limburg. Angela Meder gave an overview of the situation in the habitats of the eastern and western gorillas. Political tensions, poaching, diseases and the depletion of natural resources continue to threaten habitats and their inhabitants. In some areas, however, the gorilla populations are developing positively.

Burkhard Bröcker reported on inquiries from various companies that want to work with the organisation and have developed interesting business models for this purpose. We see this as a positive signal for the increasing awareness for B&RD.

The visit to a zoo, which usually takes place on the second day of our meetings and which we particularly appreciate, had to be omitted this time. The conversations while strolling through the old town and during dinner in the terrace restaurant not far from the cathedral offered a small compensation for this.

Next year we hope to see our members again over two days.

Marieberthe Hoffmann-Falk

Our Donors

From May to October 2021 we received major donations by: Fredrik Bakels, Volker and Pamela Beck, Julien Besthorn, Michael Beutel, Achim and Birgit Bierther, Meike Brandt-Ellermeier, Burkhard and Ingrid Brö-cker, Katleen Chmelka, Achim Christen and Rita Christen-Stuttgen, Creative Design Industries GmbH, Marcello Dubbert, Holger Egger, Hermann Ferling, Pascal Fliegner, Fördergesellschaft Lions-Club Hamburg, Felix Fraenkle, Jürgen and Irmgard Friedrich, Gaia Nature Fund, Gleis7 GmbH, Gorilla Gym Hamburg, Dieter and Ulrike Grebe, Carolin Gruber, Birgit Höfer, Simon Hottel, Daniela Huber, Michael Jähde, Marko Jankov, Stephan Kahl, estate of Rene Kaschta, Lara-Madlen Franke-Kleinert, Heiner and Lydia Klös, Angelika Krebber, Susanne Kretzschmar, Bernhard and Tamara Kritschel-Denk, Klaus-Peter and Cornelia Kuhlmann, Tatjana Kupczyk, Daniela Lachmund, Renee Läßig, Isabella Löber, Beate Luhme, Tom Macke, Elisabeth Matzer, Daniel Meyer, Joachim and Heidi Michels, Michael and Regina Möhring, Marie-Luise Niketta-Holzschneider, Uwe Neumeister, Hanna Otte, Ozaru Books, Manfred Paul, Projekt Real GmbH, proWIN pro nature, Klaus Radermacher, Hanna Rank-Wetzel, Birgit Reime, Anke Reinhardt, Daniela Rogge, Rosenapotheke Dr. Alexander Schroeder, Alfred Roszyk, Petra Salvermoser, Frank Alexander Sattler, Sophie Schade, Christian Schaub, Michaela Scheer, Monika Schiemann, Torsten Schlag, Stefanie and Heinz Schleich, Thomas Schulz, Eva Schweikart, Stephanie Skolik, Hartmut Stade, Andrea Stütz, Surfing Gorilla, Dominik Tappe, Torbau Walter GmbH, Steve Tyler, Christof Wiedemair, Klaudia Woede, Angelika Woels, Ingo Wolfeneck, Christine Woll, Brigitte Wullert, Benjamin Zaruba, Rebecca Zindler and Zoo Rostock.

In Büren, Switzerland, the school class 5a painted with teacher Peter Maeder and sold the products to donate the proceeds to us.

Many thanks to all donors, also to those we could not name here! We wish you a happy 2022!

BERGGORILLA & REGENWALD DIREKTHILFE

We do not only receive donations in euros or dollars, but also mobile phones for recycling. Burkhard Bröcker took over the coordination. Thales in Ditzingen near Stuttgart recently started an appeal among the employees and was very successful (see the table full of collected phones).

Photo: Thales Group

The number of phones sent to us ranges from 1 to 500; some people start appeals in their companies. The large parcels in the photo at the right were sent by Daimler TSS, for example.

Photos: Burkhard Bröcker

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