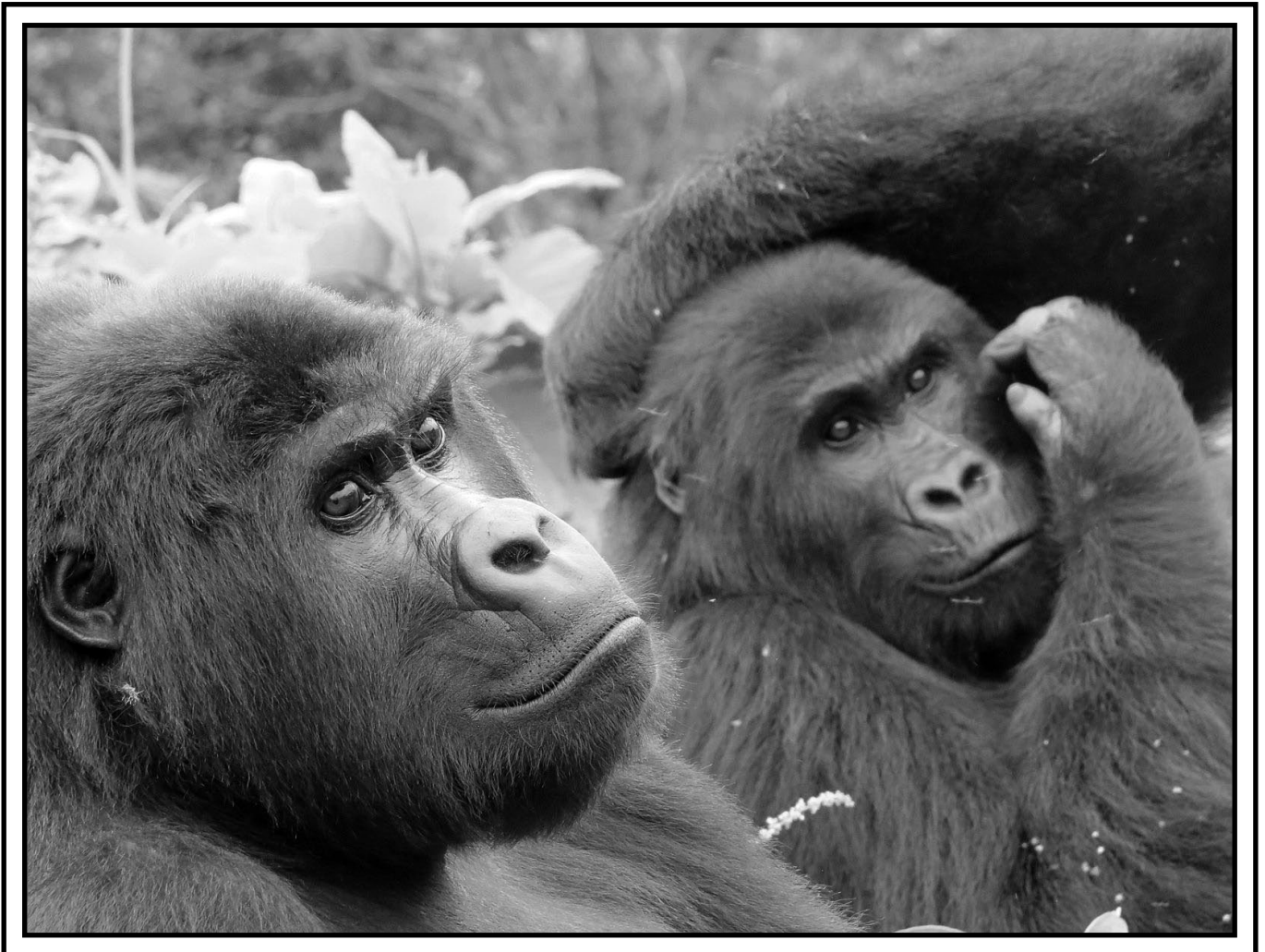




Gorilla Journal

Journal of Berggorilla & Regenwald Direkthilfe

No. 59, December 2019

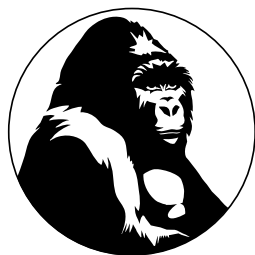


**Progress
at GRACE
despite Serious
Challenges**

**Population of
Bwindi Gorillas
Increases to 459**

**Protection of
Cross River
Gorillas in
Takamanda**

**The EAZA Great
Ape TAG and in
situ Conservation**



BERGGORILLA & REGENWALD DIREKTHILFE

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Gorilla Journal 59, December 2019

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Cover: Some of the gorillas at the GRACE Center

Photo: GRACE

Bank Account:

IBAN DE06 3625 0000 0353 3443 15

BIC SPMHDE3E

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IBAN CH90 0900 0000 4046 1685 7

BIC POFICHBEXX

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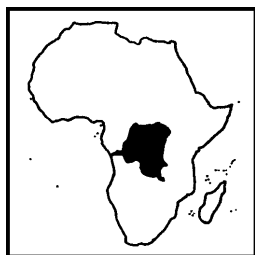
Yorick Niess studied International Negotiations (INP) in Geneva. Apart from his job at the broadcasting service SWR he has been active for the AWP on an honorary basis for more than 4 years, with a focus on Africa.

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Dr. Martha Robbins, a research associate at the Max Planck Institute for Evolutionary Anthropology, has been studying the behavioural ecology of gorillas since 1990. Since 1998, she has been studying the socioecology and reproductive strategies of mountain gorillas in Bwindi Impenetrable National Park, since 2005 she has been working with the gorillas in Loango.

Claude Sikubwabo Kiyengo conducted a gorilla survey in the Maiko National Park and took part in a gorilla census in Kahuzi-Biega. He worked for the ICCN in Goma, for the IUCN program PPP and for the regional office of IUCN in Central Africa. He was previously chief conservator of the Parc National des Virunga, central sector, the coordinator of the NGO VONA, the PACEBCo expert for conservation and biodiversity in the Virunga region (CO-MIFAC), and since 2008 he has been our assistant.



D. R. CONGO

Supporting Bamboo Cultivation in the Vicinity of Mount Tshiaberimu

In order to preserve the ecosystems of Mount Tshiaberimu, Berggorilla & Re-genwald Direkthilfe has made it its duty to keep up its support for this fragile site. Two forms of support are provided: direct support for the trackers for gorilla monitoring within the park, and support for community development and improved sanitation for the well-being of the population. Community development activities are chosen from a range of requests. Activities are chosen that contribute to the development of the community while also having a positive impact on the conservation of Mount Tshiaberimu; in addition, the activities should provide opportunities to sensitize the local residents regarding the protection of the gorillas.

Ongoing activities include

- the planting of bamboo
- the cultivation of potatoes
- beekeeping
- domestic water supply

Nurseries and the Planting of Bamboo

Bamboo is a precious material which the locals use extensively for a range of purposes. For example, they use bamboo to make small wrappings for fruit and larger baskets for potatoes, cabbages, leeks and other vegetables. Bamboo baskets are also used to transport chickens, or fish from Lake Edward, to the villages, and to make mats and implements for cleaning teeth. More than 70 % of the population in the vicinity of Mount Tshiaberimu use nothing but bamboo for the construction of their houses (Kyungu Kasolene 2015, unpublished report). Bamboo is also sold in its unprocessed form in

several markets such as Masereka, Nyabili, Kilalo/Luveve and Magheria.

As yet, there is no estimation of how much bamboo is used in this way – but it is clear that objects or baskets made from bamboo can be found in every household in the territories of Beni and Lubero, where the population exceeds one million people. The same objects can also be found in households outside these two territories, and just about everybody passing on the Goma–Butembo, Butembo–Beni–Bunia and Kisangani routes buys food wrapped in bamboo leaves.

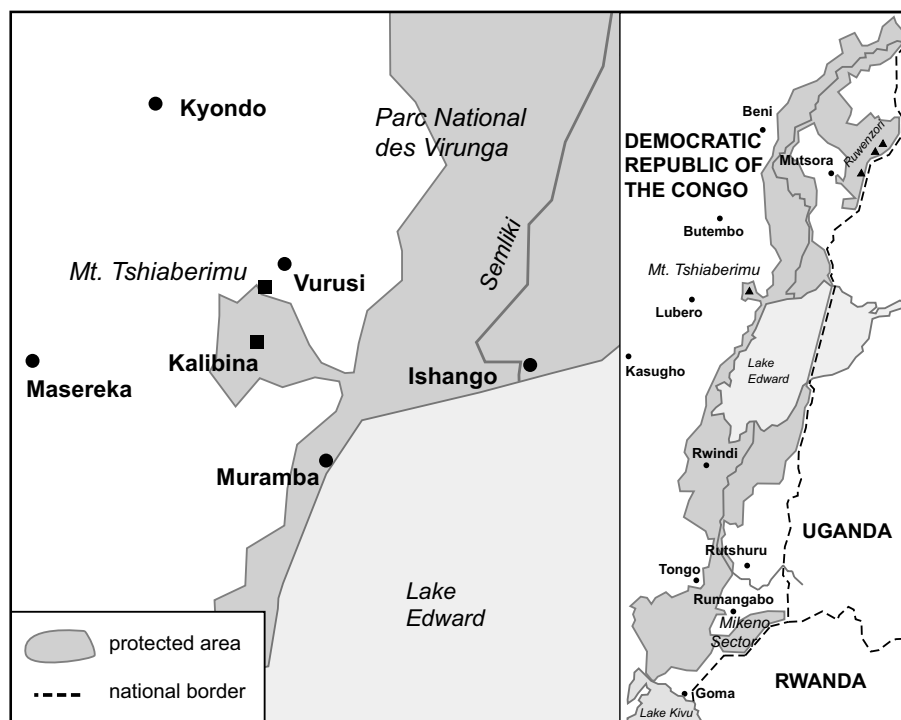
Considering the thousands of people who travel on these routes every month, we can imagine the size of the area that has been cleared of bamboo to supply this demand.

Short History and Motivation

On Mount Tshiaberimu, gorillas from the Kipura family spend between 60 % and 90 % of their time in the bamboo zone, and the Katsavara family spends between 35 % and 90 % of their time there, depending on the season (GO Report 2014). It should be noted that this vegetation zone, which used to cover almost the entire area of Mount Tshiaberimu, now only occurs at the highest altitudes, and its area continues to decrease.

In the villages of Camp Ngai and Kikyoo, two sub-sectors of Mount Tshiaberimu, the most common illegal activity observed in the park is the cutting of bamboo. To cut bamboo, the local people cross remote borders of the park. The bamboo is taken to the villages of Masereka, Vuholu, and Kivetya – areas that are known for their production of vegetables (cabbage, carrots, beetroot, onions) and potatoes – produce that is sold wrapped in bamboo leaves.

Planting bamboo in the Chieftdom can serve not only to help stabilize the bamboo zone but to help it regenerate and spread back to the lower-altitude areas of the park. This could create fa-



Mt. Tshiaberimu and the Virunga National Park

Maps: Angela Meder



D. R. CONGO

avourable conditions for in-coming gorillas and help to increase the gorilla population at Mount Tshiaberimu, which is in decline.

Results

Currently, a project that plans to plant 15,000 bamboo plants is being finalized. Beginning in March 2019, nurseries have been established with a target of producing 15,000 plants and shoots. Nursery staff were, unfortunately, hampered by an unusual dry season resulting in the loss of 65% of plants from cuttings and 10% from shoots; in total, 5,625 plants were lost. The first round of production therefore resulted in only 9,400 plants. Work is under way to replace lost plants with plants from the shoots only. The nursery staff have planted 3,200 more plants but their efforts and funds are now exhausted. 84% of the project target has been achieved.

The main target groups of this project are the large villages of Kyondo, Buwagha, Vurusi, Luseke, Kabeka, Bulambo and Vikuku. The smaller settlements between these large villages have not been forgotten – it is hoped that everybody who wants bamboo plants will get some.

Potato Crop Promotion Project

This project aims to improve potato cultivation in the vicinity of Mount Tshiaberimu by bringing in new techniques and high-yielding seeds.

The potato cultivation project was identified as a request of the population via the CEDAK Association (Coalition for Sustainable Environment Near Mount Kyabirimu) and provides both an impetus for development and an activity that can serve as a focus for awareness activities for gorilla conservation.

According to the association, 85% of the inhabitants of the Beni territory in general – and those of the communities bordering Mount Tshiaberimu in particular – depend on agricul-

ture. This activity is carried out mostly by women whose agricultural produce contributes to the survival of their families. These women farmers face difficulties in acquiring improved seeds that will return a viable profit from their agricultural production. Failure to acquire improved seeds leads to lower agricultural productivity, which means that no household income is generated because women farmers produce only enough for direct consumption in the households, with none left for sale in the market. This leads to the slopes of Mount Tshiaberimu being invaded as people search for arable land, which results in the degradation of the forest and causes conflicts between eco-guardians and local communities.

This project was chosen to make potato cultivation more popular and to raise the socio-economic standard of households by increasing agricultural production, thus reducing pressure on the Tshiaberimu forest.

The project aims to

- strengthen agricultural production in the communities bordering Mount Tshiaberimu,
- encourage the farming communities bordering Mount Tshiaberimu to use

improved seeds and to practice new cultivation techniques,

- contribute to the increase of agricultural production in order to raise the socio-economic standard of the households,
- encourage the local farming communities to get involved in the protection of Mount Tshiaberimu,
- provide and distribute improved seeds,
- reduce conflicts between local farmers and the management of Mount Tshiaberimu.

Project Implementation

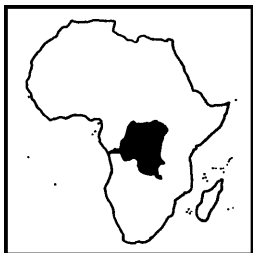
The CEDAK Association organised four groups of people, two for women and two for young people. Each group received a field and received 344 kg of Carolis potato seeds, a potato variety whose yield is estimated to be four times that of the local varieties.

These nucleus groups started by acquiring their fields, collecting natural fertilizer (cattle dung), ploughing and then planting the seeds in the naturally fertilized area. Weeding has already been done and spraying is underway to eliminate crop pests. The harvest is scheduled for mid-November 2019.



Adding compost to a field before planting potatoes

Photo: Marie Rose Kavira



D. R. CONGO



The existing water source of Vurusi village – a muddy pool

Photo: Kasereka Gervais

Other Projects

Beekeeping: The first beekeeping project was carried out in 2017 on

Mount Tshiaberimu and in Sarambwe. The success of this project led to its replication on Mount Tshiaberimu, using only local hives. This beekeeping project is progressing well. 100 hives have been manufactured and supplied, 25 hives already contain bees and with the start of the rainy season, the plants will start flowering and the remaining hives should also be populated.

Project for the development of drinking water sources: The majority of communities bordering Mount Tshiaberimu suffer from a lack of drinking water. This results in the spread of waterborne diseases such as diarrhoea, typhoid, amoebiasis and ascariasis, leading to poor health and affecting people's ability to work, therefore having a negative impact on production and on household incomes. Over 80% of households do not have easy access to water. To access water, they sometimes need to travel long distances on very steep terrain and run the risk of slipping and injuring themselves. The women and children are responsible for collecting

water. They spend a lot of time doing this and it sometimes exposes them to sexual violence.

A first water supply project is in its start-up phase. This project will contribute to improving the health of the population in Vurusi village (bordering Tshiaberimu) and will mean that women and children need to spend less time collecting water. Having time and being healthy helps them to work effectively and this in turn contributes to household incomes.

Claude Sikubwabo Kiyengo

Progress at GRACE Amid Serious Challenges

The past two years have proven challenging for the Gorilla Rehabilitation and Conservation Education (GRACE) Center, the world's only sanctuary for orphaned Grauer's gorillas (*Gorilla beringei graueri*). Serious insecurity broke out in the Kasugho region of North Kivu, Democratic Republic of

Efficient Cooking Stoves for the Population at Mt. Tshiaberimu

Currently the supply of electric power covers less than 30 % of the energy and is available only for a small percentage of the population in eastern Democratic Republic of the Congo. For purposes such as heating and cooking, firewood and charcoal are used in general.

One of the main reasons why people enter protected areas illegally is the collection of wood for the production of charcoal. So more efficient stoves would reduce the pressure on the Virunga National Park. Energy-efficient charcoal stoves for cooking have been tested throughout eastern Congo for more than a decade. They are widely used in all the cities of North

Kivu. Efficient stoves only need half as much charcoal as traditional ones.

We would like to provide such stoves to the population around Mt. Tshiaberimu. The production of stoves for 500 households would cost 7,135 euros, including the hangar for their production and training for the people how to use them.

Beneficiaries would be asked to set up local tree nurseries, so deforestation could be reduced further.

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This project will reduce the pressure on the Virunga National Park, please support it!

The population around the Sarambwe Reserve is also interested to participate.

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

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D. R. CONGO

the Congo, where GRACE is located, in mid-2017. Competing Mai-Mai forces took control of nearby villages for months at a time, and much of the local population was displaced by the violence.

In 2018, security began to slowly improve, but then an outbreak of the Ebola virus was declared in August. Butembo, the closest town to GRACE, has been one of the epicenters of the outbreak, which continues today and is now the second largest in history.

The GRACE DRC staff remained onsite throughout these crises, and the day-to-day care of the gorillas continued uninterrupted, thanks to their dedication and courage. For their unwavering commitment to the gorillas, the entire team was recognized by the Disney Conservation Fund as Conservation Heroes.

Protecting our staff, the gorillas, and the GRACE site have been prioritized, and we have had to adjust some of our activities and programs accordingly. For example, strict biosecurity protocols were put into place at GRACE when the Ebola outbreak began, and our onsite local visitor program was suspended to decrease exposure risk to GRACE staff and the gorillas.

Amid these challenges, we have managed to also make progress on some key projects. In 2018, we opened a second habitat for the 14 Grauer's



The GRACE gorillas as seen on the Explore.org livestream camera

Photo: GRACE/Explore.org

gorillas in our care, giving them a total of 15.8 ha of forest for daily use. This is important for their rehabilitation, as the gorillas now forage for nearly all of their food on their own inside the forest.

Additionally, in 2018 we completed construction on an education center, which will serve as a hub for all of our education and community outreach activities. Because in-person contacts had to be limited due to Ebola concerns, GRACE's education team has shifted their focus to small-scale projects. One major ongoing effort is to reduce the amount of wood people use for household cooking fires by promoting the use of more efficient stoves. Our 100-household community survey showed that wood is the main source of fuel used in villages around GRACE and that people are extracting wood from the forests, including in and around Tayna Nature Reserve, an important habitat for wild Grauer's gorillas and chimpanzees. We adopted a stove design that reduces wood use by 47% on average and so far 124 households have installed these stoves.

Our other main community initiative addresses the problem of local food insecurity caused by livestock theft by armed groups. We trained a cohort of female community leaders in guinea pig husbandry and welfare, and they have started a successful breeding program that has produced 126 offspring to date. Offspring will be given to other families in a "pay-it-forward" model that will make this program sus-



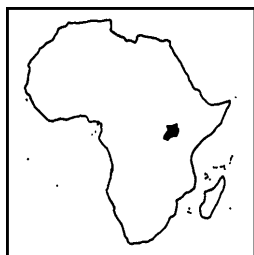
GRACE staff member washes as part of GRACE's strict hygiene protocol for Ebola prevention.

Photo: GRACE



A participant in the stove project weighs the amount of wood she uses for her stove to quantify results.

Photo: GRACE



UGANDA

tainable. We will be expanding these two promising pilot projects in 2020.

We felt it was important to independently verify that everything at GRACE adhered to sanctuary best practices to ensure that we were doing all that we could to provide the best life for the gorillas in our care. We therefore applied for, and in 2019 received, Accredited status with the Global Federation of Animal Sanctuaries (GFAS), the only globally recognized organization that provides standards for identifying excellence in animal sanctuaries. GRACE is the first great ape sanctuary in Africa to receive GFAS accreditation.

At GRACE, we also recently launched Africa's first 24/7 live-stream gorilla camera in partnership with Explore.org, a philanthropic multimedia organization that sponsors the world's largest live nature network. The GRACE camera is located at the entrance of the gorillas' forest habitat, so online viewers can watch in real time as the gorillas come and go each day. GRACE is in a remote area and is not open to tourists, so this camera is a resource that can help us share the gorillas with the world. This is important as the GRACE gorillas can act as ambassadors for their counterparts in the wild and hopefully increase support for their protection.

Sonya Kahlenberg, Jackson Kabuyaya Mbeke and Tammie Bettinger

GRACE webcam

Watch here: <https://explore.org/livestreams/grace-gorillas/gorilla-forest-corridor>

Population of Bwindi Gorillas Increases to 459

Taking into account the latest census from Bwindi-Sarambwe, and including the figures for Virunga gorillas from the 2015–2016 census, the global total population of mountain gorillas (*Gorilla beringei beringei*) now stands at 1,063 individuals.

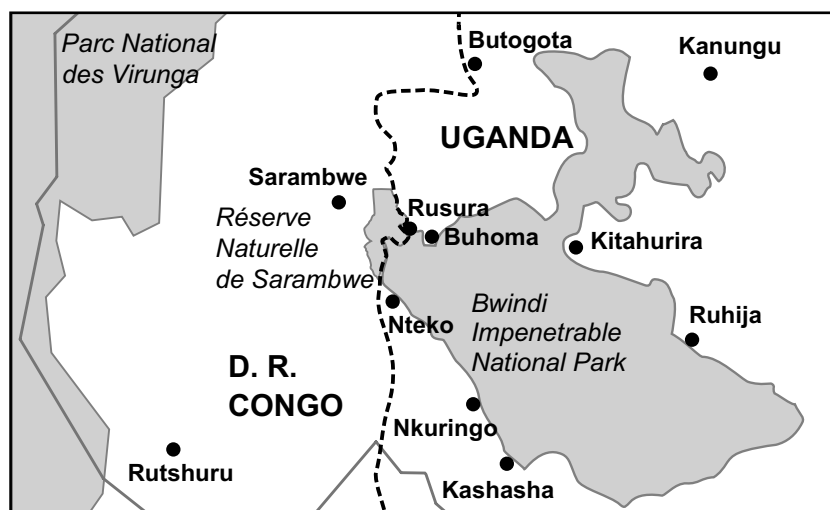
The Bwindi-Sarambwe ecosystem is one of the two areas where mountain gorillas occur. This habitat covers 340 km² and extends from Uganda to the Democratic Republic of the Congo.

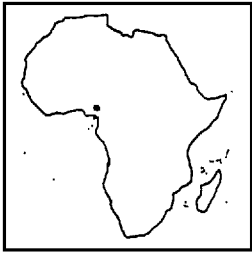
For the latest census, 75 staff surveyed the area in two sweeps, the first between March and May 2018 (62 days) and the second from October to December 2018 (60 days). On discovering fresh or recent signs of gorillas, the surveyors followed the signs until they had located three nest sites, from which they collected faecal samples for the genetic identification of individual gorillas. The results showed that at least 459 gorillas roam Bwindi and the adjacent Sarambwe Reserve, 263 of which were previously unknown. Not every gorilla is detected by this method, but we can say with certainty that the mountain gorilla population in Bwindi-Sarambwe has increased significantly since the last census in 2011, when a population of 400 gorillas was estimated. Sarambwe Reserve was included in the census – for the first time – because several groups of Bwindi gorillas occasionally visit this area; thus previous surveys may have failed to record all the gorillas that occur in Bwindi.

However, in spite of the encouraging survey results, it is not possible to sit back and relax: illegal activities in the protected areas continue unabated, as testified by the surveyors: the teams destroyed 88 snares, a similar number as in 2011.

Summary of a press release by IGCP

You can read more about this in the final census report: http://igcp.org/wp-content/uploads/Bwindi-Sarambwe-2018-Final-Report-2019_12_15.pdf





CROSS RIVER

Critical Forest Corridor for Cross River Gorillas Threatened

Protecting forest corridors that allow movement and genetic exchange between Cross River gorilla subpopulations and groups is critical to their long-term survival. The Afi River Forest Reserve, which covers approximately 380 km², is an important corridor linking the Afi Mountain Wildlife Sanctuary to the Mbe Mountains and the contiguous Okwangwo Division of Cross River National Park – the three sites where gorillas are found in Nigeria.

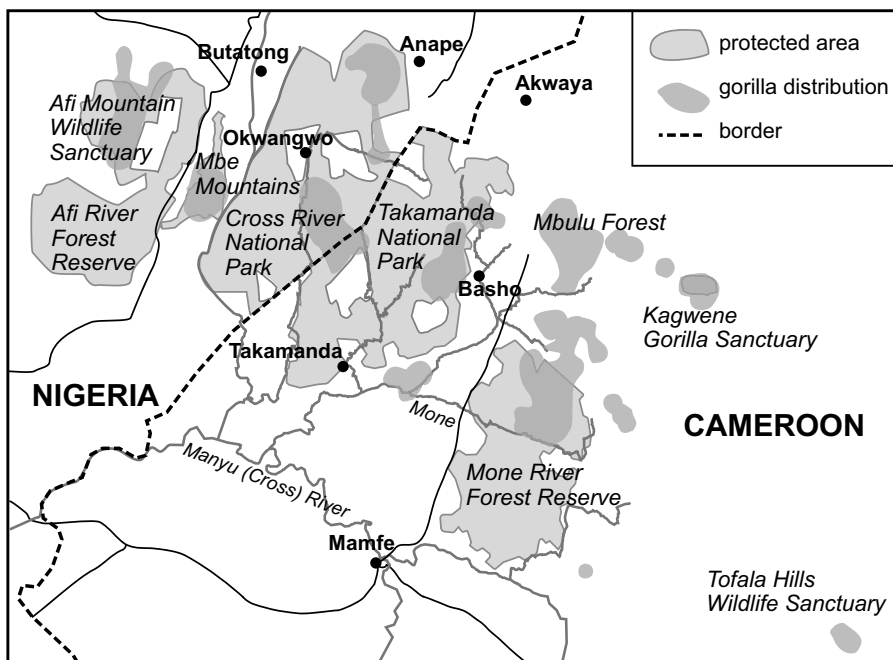
The loss of this important corridor will have consequences for the long-term viability of the small, increasingly isolated population of gorillas living in the Afi Mountain Wildlife Sanctuary. This is why WCS and other stakeholders in Cross River State were alarmed by recent reports of the bulldozing of

large tracts of forest within the reserve. In early 2019, WCS received reports of extensive clearing of the southeastern axis of the reserve with bulldozers, ostensibly to establish a cocoa plantation. While farm encroachment and illegal logging within the reserve are existing threats, the recent invasion of the reserve by an unknown group supposedly for large-scale cocoa farming gives a new dimension to the problem. Preliminary investigations by WCS revealed that the clearing started after an unknown group of people held consultations with one of the surrounding communities apparently to obtain the community's support with the promise of joint ownership of the farm to be established. Although WCS reported the illegal activity to the Cross River State Forestry Commission that manages the reserve, the bulldozing continued for weeks unchecked. Fortunately, with sustained pressure from WCS, the clearing eventually stopped and the



A bulldozer and timber inside the Afi River Forest Reserve, 1 April 2019

Photos: WCS Nigeria

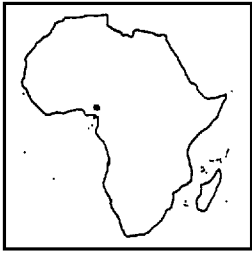


Location of Afi River Forest Reserve and other sites in the Cross River gorilla landscape

Map: Angela Meder, with information from Richard Bergl

bulldozers moved out of the forest. Efforts to identify the people behind the clearing and what kind of authorization they may have had were not successful. Similar unconfirmed reports have been heard of the acquisition of land in other forest areas of the state for large-scale cocoa farming.

Early this year, the federal government of Nigeria announced plans to provide intervention funds to boost the production of cocoa, oil palm and other cash crops as part of efforts to boost exports. Following in the footsteps of the federal government, the Cross River State government has also announced renewed commitment to increase cocoa and oil palm production in the state. While this renewed interest and commitment of government to boost agricultural production is commendable, any planned increase in cocoa and oil palm production should be



CROSS RIVER

done in a way that minimizes impact on biodiversity, targeting already degraded areas rather than the state's remaining forest.

WCS calls on the Cross River State Forestry Commission to take measures urgently to stop further deforestation of the Afi River Forest Reserve to enhance the survival prospects of the population of Cross River gorillas in the Afi Mountain Wildlife Sanctuary that needs the corridor provided by the reserve to move and have genetic contact with other groups.

Inaoyom Imong and Jonathan Eban

Protection of the Cross River Gorillas in Takamanda National Park

The Takamanda National Park is not only a home to many of the endangered Cross River gorillas (*Gorilla gorilla diehli*), but also to people. Currently, civil war is looming in the region. While large international organisations such as WWF and WCS have pulled out of the area, the AWP (Association for Wildlife Protection – www.awpwildlife.org), a small organisation located in Freiburg in southern Germany, has remained, refusing to abandon the gorillas and the human residents.

Hardly any information about the status of the great apes comes out of the region. For over two years, the species-rich national park has been a military combat zone: Rebels use the forest as a refuge and the government tries to recapture the area. The local people live in the middle. In 2017, they were told to leave their homes within 48 hours. Many fled across the border to Nigeria, some of them reaching a reception centre set up by the UNHCR. Although the civil war is still ongoing, some have now returned to their villages to rebuild their lives. AWP assists them in this endeavor, hoping in turn for their support in protecting the gorillas.



Cocoa harvest

Photo: AWP

Fighting Poverty with Cocoa Beans
Gorilla conservation only works in cooperation with the local people. Most of them are farmers and live from cocoa cultivation, but they cannot increase the area they are cultivating and there

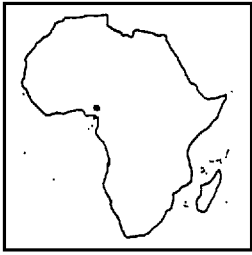
are no roads to transport the harvest. Even before the unrest started, their income was extremely low.

In 2018, AWP started the construction of a solar dryer. It allows them to keep the harvest dry during the rainy



Installation of fermentation boxes for cocoa

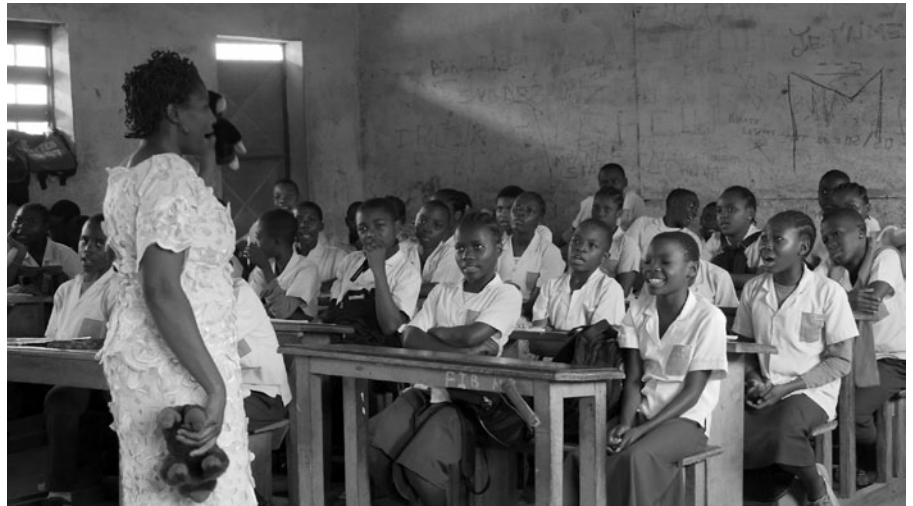
Photo: AWP



CROSS RIVER

season, preventing loss due to mould. AWP's condition for setting up the dryer was that the facility should only be used by farmers who are actively involved in gorilla protection and that women should have equal access to the dryer. The construction work was completed in mid-2019, although all building materials had to be transported by boat and motorcycle through an area affected by civil war.

During its first test run, the dryer proved to have a capacity of 1.25 tons per week – sufficient for the harvest of the entire village. In addition, AWP installed fermentation boxes to improve the quality of the harvest. We hope that the new facility will ensure that the farmers' income will increase by 8–10 %, a first step in freeing the population from poverty. A second step would be to enable the farmers to sell their beans at a fair price. To this end, we have offered their cocoa beans to leading European chocolate producers – and the results are promising.



School education – in the classroom

Photo: AWP

School Education for Civil War Children

The conflict in the English-speaking part of Cameroon started with a new education policy of the French-speaking central government. This was followed by several years of school kidnappings

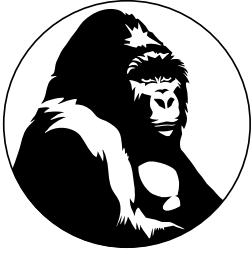
and threats to prevent the children from attending school. It is always the children who suffer. AWP is currently the only organisation to restore a little bit of normality for the approximately 8,000 children in Takamanda. In collaboration with Wilhelma Zoological and Botanical Gardens Stuttgart, we help children aged 7 to 17 to catch up on regular lessons with a mobile classroom. We further implement learning games and a singing contest. The educational goal is to impart motor, linguistic and social skills to the students. In addition, the children also learn to live peacefully alongside their animal neighbours, specifically the Cross River gorillas and the Nigeria-Cameroon chimpanzees.

The educational project is delivered in class during the school term: in effect, a project week. In Takamanda, the classes are mixed and consist of up to 60 students, sometimes with great differences in age – a challenge for our educators who have been specially trained for the programme. The modern methods that are employed, such as station learning, group seating or individual child support, are also unusual. In order to obtain the "Ape Expert" certificate, students must pass a

Working for gorilla conservation in western Cameroon is exhausting and risky for AWP staff: simply getting to the Takamanda National Park may endanger their lives. For example, the road to Mamfé was considered impassable until the project manager, Mrs Ngwasina, travelled it unharmed. There are also so-called "ghost towns", where, on some days, trade stops and neither buses, nor hotels, nor food are available. Power outages and the loss of telephone and internet connections also hamper communication. Plus, without warning, you might find yourself in the middle of a gun fight on the streets. Experts advised us against the use of bulletproof vests – if these fell into the hands of the rebels, they could be regarded by the government as "military supplies" because they give the enemy a military advantage.

Again and again our teams are detained for hours and screened by the military or the rebels in so-called "check points". Even when they have finally reached their destination in the national park, our teams are still exposed to suspicious looks, and their communications are intercepted to make sure that they are not spies.

In spite of this difficult situation, the project has been running for two years, and we can see how the situation in Takamanda is slowly getting better. Smiles are returning to people's faces, people who are willing to protect even gorillas from danger.



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written examination. Especially dedicated children receive soft animal toys as prizes.

Yorick Niess

We have the agreement of the Cameroonian Ministry of the Environment to extend our project to other villages, and the word of the rebels who respect our commitment to the region. You – as readers of this magazine and supporters of Berggorilla & Regenwald Direkthilfe – are currently among the few who make our involvement possible. On behalf of the indigenous people of Kekpani, I would like to thank you for this.

These children passed the examination for the Ape Expert certificate and received animal toys.

Photo: AWP

Rubber Plantation Close to the Dja Reserve

According to a report by Greenpeace Africa, the Singaporean based company Halycon Agri and her Cameroonian subsidiary Sudcam operate a rubber plantation business in Cameroon. These operations are threatening the ecosystem and local and indigenous communities in the periphery of the Dja Faunal Reserve, a UNESCO World Heritage site since 1987. It is home to 14 primate species. Sudcam's plantation is separated from the protected area by only 100 to 200 m of forest.

Sudcam has cleared more than 10,000 ha of dense tropical rainforest to make way for rubber plantation between 2011 and 2018. They are responsible for the most devastating new forest clearance for industrial agriculture in the Congo basin. Since the beginning of 2019, clearing has accelerated.

Sudcam's convention in 2011 with the Minister of Economy, Planning and Regional Development (MINEPAT) granted Sudcam the right to develop and expand a large-scale plantation and production zone. It also gave the company exclusive rights to extract and use water in the concession area without further authorisations or fees and the right to put up roadblocks. Sudcam also has the right to ignore future laws and regulations passed by parliament or other state bodies.

Basic information to assess and monitor Sudcam's operations and relations with communities is lacking. There is no evidence of meetings between Sudcam and local communities, no memorandum of understanding, no official concession maps, no investment agreement, no certificate of environmental conformity and impact assessments. This contradicts standards and procurement policies set by Halycon Agri and Sudcam customers such as global tyre manufacturers.

From a press release by Greenpeace Africa

Greenpeace Africa

Halycon Agri's Ruinous Rubber. July 2018. 16 pages. Download PDF (5.88 MB): <https://www.greenpeace.org/archive-africa/Global/africa/Forests/Publications/Greenpeace%20Africa-Sudcam-Report-2018-1.pdf>



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Stay or leave? Female Reproductive Costs in Western Gorillas

Western gorillas live in social groups that consist of one silverback, several females and immature offspring. Females rely on the silverback who, with his impressive body size, can protect them and their offspring against predators and other adult males. Adult females may transfer between groups multiple times in their lives (also called secondary transfers) and transfer directly during inter-group encounters (Stokes et al. 2003). This strategy is very rare among primates and is believed to represent female choice for a strong and powerful male (Harcourt & Stewart 2007).

Because females rely on silverbacks to protect them and their offspring, they should choose to reside with a male who provides the best protection and is of high strength. Just as in humans and other animals, males vary in their size and power, and as silverbacks age their strength diminishes. As a re-



Female Bessie (in George's group, left) checks out younger male Coriander.

Photo: Vidrige Kandza/WCS Congo

sult, females transfer between social groups but they do not all transfer with the same frequency. Some females will leave a group after each of their offspring is weaned, up to six times in their lives, while other females have

stayed with the same silverback for as long as 20 years.

When a silverback dies, all females leave to join a new male. If at that point a female has an infant that is not yet weaned, then the new silverback will most likely kill it (this is called infanticide) in order to breed with the female right away and raise his own offspring. Although infanticide has never been directly observed in western lowland gorillas, it can be inferred when an unweaned infant disappears after a female has transferred to a new group. Female western gorillas can reduce the likelihood of such infanticide from happening by leaving a male during the limited time window immediately after their offspring was weaned and before they conceive their next offspring. Females then leave their weaned offspring behind with their father.

However, transferring to a new male may also involve costs such as loss of habitat familiarity, higher rates of aggression towards the immigrating female and reproductive delays. Therefore, the optimal strategy for a female



The clearing of Mbeli Bai

Photo: WCS Congo



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to improve her reproductive output over the course of her life may involve a trade-off between the costs of dispersing and the benefits of choosing a more protective male. The timing of dispersal may be essential to improve a female's reproduction.

These different strategies of males and females lead to the following questions: Do female western gorillas suffer higher reproductive costs when they disperse? Do they suffer reproductive costs when they stay with a male near the end of his tenure? What is the best strategy that females should use to improve their reproductive rate? In order to address these questions, we used the data from a 20-year study (1995–2015) of a wild population of western lowland gorillas at Mbeli Bai, in the Nouabale-Ndoki National Park in

northern Republic of the Congo. Mbeli Bai is a 13 ha swampy natural forest clearing in the middle of the rain forest, which contains vegetation rich in minerals that attracts numerous groups of gorillas. We observed the gorillas by using telescopes, digital cameras and videos, from a 9 meter-high platform overlooking the clearing and allowing almost 100 % visibility. We identified each gorilla using facial features, body size and pelage coloration. A total of 440 gorillas were observed since the beginning of the study including 229 infants born to 100 adult females in a total of 36 breeding groups.

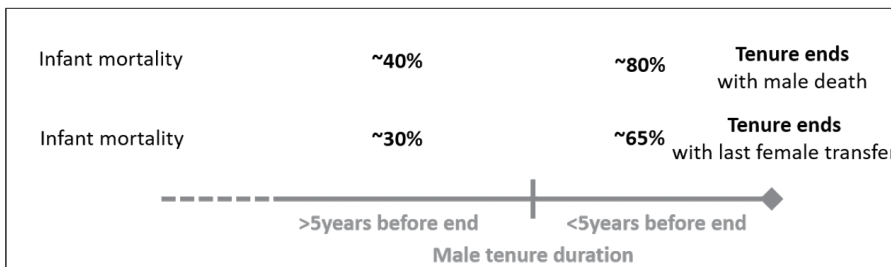
We found that a higher percentage of infants die if they are born when the male is old and near the end of his tenure compared with infants born when the silverback is in the early years of

his tenure (80 % versus 40 % infant mortality, see A in the figure). However, we also found that infant mortality was higher at the end of a male's reproductive career even if we exclude males whose tenure ended by their death (65 % versus 30 % infant mortality, see A in the figure), suggesting that the male's capability of protecting his offspring against predators or other males is decreasing as he ages and nears the end of his tenure. Therefore, females suffer a reproductive cost by staying with males who are near the end of their tenure and it would be advantageous to transfer to a stronger and younger male.

However, when females transfer to a different male, they have longer intervals between births (5 months longer) and hence fewer births over their lifetime, which is similar to reproductive delays from transferring observed in mountain gorillas (Robbins et al. 2009). These delays can be substantial: females that transferred four times during their life took approximately 10 years longer to produce a surviving offspring compared to females that never transferred (see B in the figure). Given the high costs of transferring, a female finds herself in a dilemma when she is with a weaker or older male: should she stay, breed with him again, and risk losing the infant if he dies, or should she leave and suffer a reproductive delay?

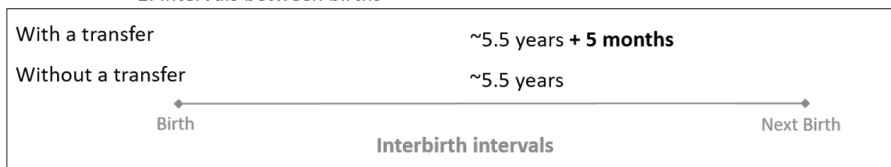
Our investigations showed that females suffer the highest cost if their infant dies. Therefore, females should leave a male if they perceive he is weak and unlikely to survive the next 5 years, which is the length of time it takes her to wean a new infant. Yet how do females know when to leave? Many females leave a male long before he dies, suggesting that they may be able to determine when he is getting weaker than other males, potentially using the outcome of aggressive displays between males when they meet as a hint.

A. Costs of staying with a male at the end of his tenure

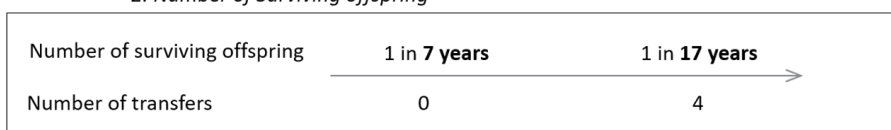


B. Costs of leaving

1. Intervals between births



2. Number of Surviving offspring



Results of the analysis for determining the reproductive costs of staying and leaving

Illustration: Marie Manguette



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Whether females do in fact intentionally leave older males and join younger and stronger males still remains to be determined.

This study contributes to our understanding of the costs and benefits of social living. The male and females form long-term social bonds and can live together for long periods of time. However, they have differing strategies of maximizing their reproductive success. This study sheds light on the mechanisms driving the grouping patterns in gorillas and the dynamic nature of their social groups, which in turn contributes to our understanding of human sociality.

Marie Manguette and Martha Robbins

Original article

Manguette, M. L., Robbins, A. M., Breuer, T., Stokes, E. J., Parnell, R. J., Robbins, M. M. (2019): *Intersexual conflict influences female reproductive success in a female-dispersing primate. Behavioral Ecology and Sociobiology* 73, 118

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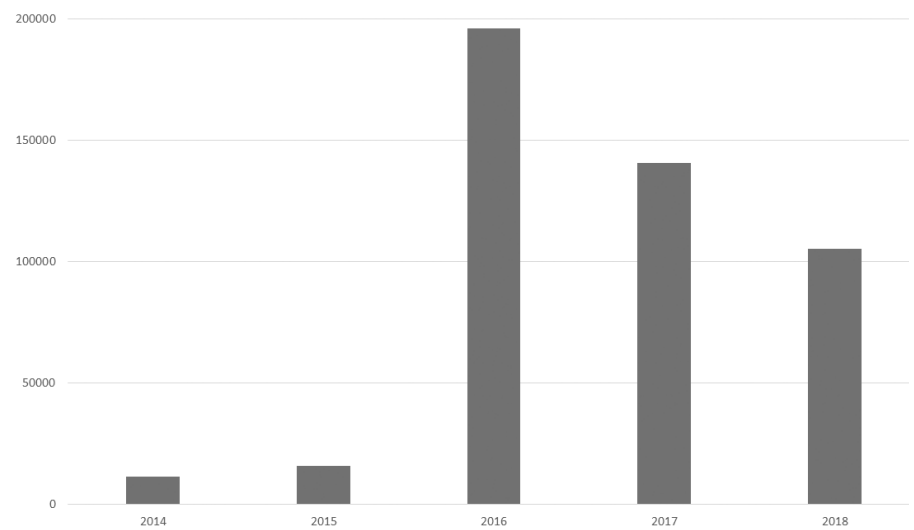
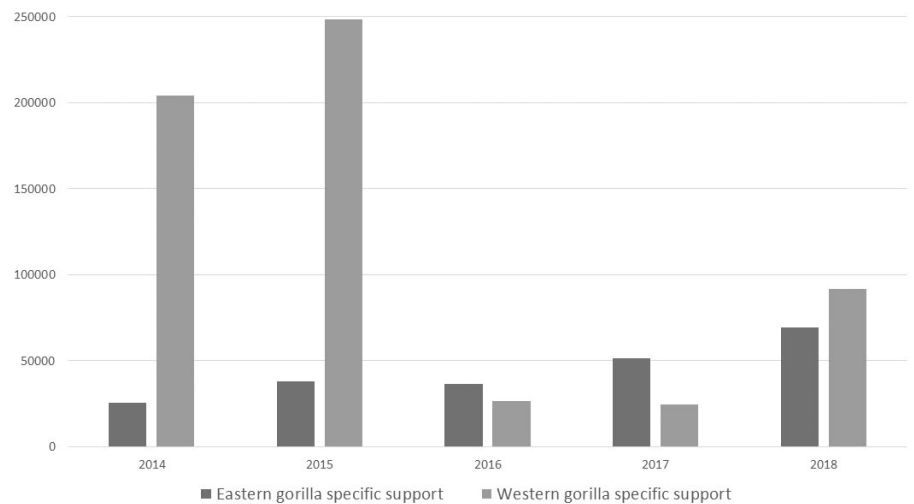
How Is the EAZA Great Ape TAG Linked to in situ Conservation?

Modern zoos are institutions that contribute towards conservation education through the conservation and research of living beings and their natural habitats. Conservation education and the research activities of zoos have the aim of helping endangered animal

species all over the world. They work collaboratively, grouped by geographic region, facilitating knowledge and resources to help obtain the best results.

The European Association of Zoos and Aquaria (EAZA) has 423 member zoos in 48 countries, more than 140 million people visit these zoos every year. One of the zoos' main goals is to establish and maintain sustainable and genetically healthy populations of threatened animals, whereby the wel-

fare of individual animals has the highest priority. These zoo populations work as ambassadors for their endangered conspecifics in the wild. Educational work within the zoos increases the interest of people to save nature. During their zoo visit they are not only informed about endangered animals but are also encouraged to support conservation projects in the wild. In addition to that, several *in situ* conservation projects are financed by zoos directly. Zoo



EAZA support for gorilla in situ conservation projects (above) and for projects that protect more than one great ape species (below)

Illustrations: Merel Zimmermann, EAZA Conservation Database 2019



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populations can provide animals for re-introduction into the wild, if necessary, as a conservation tool. The One Plan Approach helps to optimize global conservation work and facilitate a stronger link between *ex situ* and *in situ* conservation. As a result of this zoos have gained a stronger role in global conservation during the last few years.

Within the European zoo association, Taxon Advisory Groups (TAG) are responsible for management, conservation, research and husbandry of systematic groups of animals. The Great Ape TAG Vision statement clearly says that "We are committed to ensuring the long-term survival of *ex situ* and *in situ* healthy and viable bonobo, chimpanzee, gorilla, and orang-utan populations."

It is our mission "to maintain self-sustaining and healthy populations of all the taxa of great apes [...], and to encourage and promote their conservation in the wild".

For that reason, one of the main goals of the Great Ape TAG is the establishment of strong links between *ex situ* and *in situ* conservation. While we continue improving husbandry for great apes in zoos we emphasize at the same time the significance of preserving the wild populations and their

The European Association of Zoos and Aquaria (EAZA), with 423 members in 48 countries throughout Europe and the Middle East, is the largest professional zoo and aquarium association in the world, with approximately 140 million visitors per year. Re-connecting with nature and re-establishing our relationship with the world's species, to whom we owe our very existence, is essential if we are to overcome the many environmental and societal challenges ahead.



Mountain gorilla

Photo: Stefanie Reska

habitat by actively contributing to this effort.

EAZA zoos can assist field conservation efforts for great apes in a number of ways, for example, by raising the awareness of their visitors regarding the plight of wild great apes, including the fact that they are critically endangered and the reasons why; and by funding field conservation efforts through the numerous NGOs working in the field.

The TAG, in cooperation with the relevant EEPs and their conservation advisors, promotes conservation issues and supports "*ex situ*" and "*in situ*" conservation initiatives relevant to species in the TAG. It is open to a closer cooperation with IUCN, GRASP, PASA and other reputable conservation organizations in order to exchange knowledge and experience, to discuss issues concerning ape species, and to work closer together to help maintain apes in the wild.

In 2010, EAZA launched an Ape Fund Campaign to support 26 *in situ* projects for apes until 2018 for a total

amount of 573,084 euros.

A new tool to evaluate the contribution from EAZA institutions to *in situ* conservation projects is the EAZA Conservation Database. The contribution to great ape projects has been increasing during the last few years as shown in the figures.

Collaboration and communication with representatives from conservation organisations, such as IUCN, GRASP and PASA, has been quite active during recent years and it is being further reinforced to help improve the results of our common goals of conservation, education and research.

*Maria Teresa Abelló Poveda and
Sandra Reichler*

Backing the Silverback

Fundraising for *in situ* conservation at the Zoological and Botanical Garden Wilhelma in Stuttgart

These days, most zoos make an enormous and steadily increasing contribution to the conservation of



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Panoramic view of the Wilhelma's main entrance that was redesigned to explain the Conservation Euro

Photo: Wilhelma

endangered species in their natural habitats. Not only do they sensitize many millions of visitors every year to nature conservation issues, they are also focusing more and more on mobilizing these people as allies in species conservation. This becomes abundantly clear if you look at how fundraising for conservation has developed over the last 10 years at Wilhelma, the Zoological and Botanical Garden in Stuttgart.

In 2009, new ways of fundraising were developed for the first time – quite different from merely putting up donation boxes: a collection station for discarded mobile phones was placed in the former ape house. It was anything but certain that the zoo visitors would actually bring their old mobile phones with them in order to donate them to mountain gorilla conservation. But, having said that, the initiative known as the “mobile phone project” collected over 1000 devices in the first year alone, and, over the next 10 years, raised over 50,000 euros for the protection of gorillas in Africa – all thanks to the zoo visitors.

Since then, Wilhelma has continuously expanded its creative fundraising, for example by selling artworks

with wildlife motifs or organising “Great Ape Lotteries”. By 2017, 80,000 euros were being collected every year, all of which was donated to *in situ* projects. Since 2018, the growing importance of species conservation at Wilhelma has been reflected in a specific budget line



Box for mobile phone collection

Photo: Angela Meder

of 150,000 euros. The first use of this money was for the purchase of valuable rainforest areas in Belize in order to connect existing protected areas to each other through a biological corridor. This provided long-term security for 400 km² of forest, equating to the territories of at least 20 jaguars.

The most far-reaching step in establishing the zoo as a powerful ally for *in situ* projects was taken in the spring of 2019. Since then, Wilhelma has been inviting its visitors to participate in the fight to conserve biological diversity. The “Conservation Euro” is in principle included in the adult ticket price, but every Wilhelma visitor can decide at the entrance gate whether he or she wishes to make this contribution. 100 % of the proceeds are invested in further species protection projects – there are no administration fees whatsoever. The experience of the first 6 months shows that the public appreciates the importance of the issue: over 85 % of adult visitors pay the extra euro.

By mid-2019, the financial commitment to the protection of species worldwide, which began with a few thousand euros in 2009, has increased to over half a million euros. Currently, more than 20 projects are supported with



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these funds. The species that benefit range from the Vinaceous-breasted amazon parrot in Brazil to the Sumatran rhino in Indonesia and the Tequila splitfin in Mexico, which, while extinct in its natural habitat, is bred in zoos and for whose release back into the wild entire river sections are being re-naturalized.

Wilhelma is known for its successful keeping of apes, and if you look at what the zoo is doing to assist the survival of orang-utans, bonobos and gorillas, it becomes even clearer what an important impact a dedicated zoo can have on the work of local conservationists.

In Borneo, Wilhelma has been involved in the reforestation of the Lamandau River Reserve in Kalimantan, Indonesia since 2009. This is an area where wild orang-utans roam and

where confiscated animals are reintroduced into the wild. In 2019, the Conservation Euro made it possible to invest an additional 30,000 euros in the area to reforest another 9 ha in order to connect existing forest patches with each other. In areas that were reforested 10 years ago with the help of Wilhelma, the trees have now grown so tall that they offer a habitat to the orang-utans once again: two orang-utan mothers with recently-born offspring have just been spotted there.

In the west of the Democratic Republic of the Congo (DRC), bonobos are at risk from poaching and the illegal pet trade. To protect this species, Wilhelma now supports three initiatives with a two-pronged approach: to reach the urban population, local music stars are recruited to compose popular

songs about the bushmeat trade; and in those areas where the great apes occur, the villagers are involved in anti-poaching patrols. "Lola ya Bonobo" near Kinshasa, where orphaned bonobos are reared, has received financial support from Stuttgart for years; a 10,000 euro financing gap for the re-introduction of 14 animals planned for the end of 2019 was also bridged.

On the other side of the DRC, in the Virunga National Park, a specially founded sniffer dog squadron, the so-called "Congohounds", has helped protect the mountain gorillas since 2012. Wilhelma has donated over 150,000 euros to the project, financing dog training, veterinary treatment and several off-road vehicles, as well as environmental education for young Congolese.



Sniffer dog squadron, Virunga National Park, April 2017 with visitors from the Wilhelma

Photo: Wilhelma



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Congohound in the park

Photo: Stefanie Reska

The park is home to about one third of the remaining mountain gorilla population. The other two thirds live in the neighbouring countries Rwanda and Uganda – and of course the animals also cross the borders, which are not their concern. The dog handlers work tirelessly to protect the wildlife in this troubled area. This is the most dangerous national park in the world in which to work: during the last 10 years, 175 park rangers have died in armed conflicts, mainly with rebel groups. Intermittently, oil companies put the very existence of the park at risk. Last but not least, the area faced an outbreak of Ebola in 2018 which continues to be a problem in 2019.

The problems often seem overwhelming and the solutions are not simple. However, the work of dogs and rangers makes the situation in the park safer in many ways. The dog squadron patrols forest areas, takes out snares and arrests people who illegally produce charcoal in the habitat of the goril-

las for sale in the city. Poachers and anyone else breaking the law in the park can be tracked by the dogs over dozens of kilometres to the villages outside the park even days afterwards – just because of a discarded cartridge or a cigarette butt. The abilities of the dogs appear unbelievable to the local people and act as a deterrent. Over the last 3 years, there has been only one case of elephant poaching in the park and not a single gorilla has been killed by poachers during this time.

The dog squadron in Rumangabo, the headquarters of the Virunga National Park, is not the only place where Wilhelma works in support of gorillas. Several other projects in the region have been supported via Berggorilla & Regenwald Direkthilfe. Mount Tshiaberimu, located on the western side of Lake Edward, is also part of the Virunga National Park and is where the second subspecies of the eastern gorilla, Grauer's gorilla, can be seen. Here too, local projects are attempting to re-

lieve the pressure of the population on natural resources. In 2018, Wilhelma financed a bamboo project that supplies sustainably harvested construction material and firewood. A little further east in Sarambwe, which is a protected area of 900 ha, a total of 20,000 euros were invested over several years in the equipment of the local rangers. Uniforms, boots and binoculars suitable for field work were purchased and derelict ranger posts were rebuilt.

While the western lowland gorilla, one of two subspecies of the western gorilla, is kept in zoos all over the world and regularly produces offspring in captivity, the status of the population of Cross River gorillas, the second subspecies, is critical and there are no "back-up populations" in captivity. At best, 250 animals may survive in western Africa, which means that this subspecies is much more threatened than the better-known mountain gorilla. IUCN lists the Cross River gorillas as "critically endangered". In Cameroon, an environmental education project is now tackling the root causes. Via Berggorilla & Regenwald Direkthilfe, Wilhelma finances local educators who use specially developed teaching materials and workshops lasting several days to educate school children who live in the range of the Cross River gorillas about the great apes. In this way, the "Great Apes Education Program" shows children and young people potential viable action to protect the animals (see page 10).

All over the world, the challenges that nature and species conservation face are enormous. On the ground, the situation can be sobering in many cases. However, with adequate effort it is possible to save species from extinction and protect habitats from destruction. Wilhelma has successfully accepted this challenge – and thanks are due to the zoo visitors for showing solidarity.

Stefanie Reska



READING

David Johns

Conservation Politics. The Last Anti-Colonial Battle. Cambridge (Cambridge University Press) 2019. 11 illustrations, 398 pages, Paperback £ 29.99, ISBN 978-1-31664893-3. Hardcover £ 59.99, ISBN 978-1-10719958-3

The loss of biodiversity, the declining numbers of wild animals and the destruction of ecosystems is alarming. Many governments ignore their own laws and allow the exploitation and transformation of nature to ensure economic growth. David Johns argues that this is exactly how colonialism works and that conservation is an anti-colonial struggle.

The author explains why conservation movements often fail to convince governments of their concerns – they rely on science and good arguments (in their view). Their opponents mobilise many more supporters – because they are better able to convince them. To convince politicians, conservationists need to become more political. Conservation movements need to become much stronger to mobilise the masses and must return to the grassroots. Developing and sticking to a strong long-term vision is essential.

Detailed explanations of how humans influence nature and why it is important to fight against the continuing loss of biodiversity are nothing new for people familiar with conservation, but Johns also gives valuable practical advice: he lists (and explains) the central questions that conservationists should ask themselves before planning a campaign. As the author lives in the USA, the book focusses mainly on American examples. This is also reflected in his suggestions for potential ally groups to link up with. Finding allies and working together with them is one of his central ideas to promote conservation; another central idea is to learn from other movements.

Johns gives an overview of the problems and provides many suggestions

as to how politics can embrace conservation. The suggestions are rather general, but the subject is very complex and each case is different. He also describes the strategies used by those who are opposed to conservation. His message is that in order to achieve their goals, conservation scientists have to engage more in politics, they need to guide and persuade decision makers. An important tool in convincing others is to use a language that they understand – which is often not easy for scientists. Storytelling may be a good way of getting a message across.

But the author does not stop here – he advocates a change in our culture and politics towards eco-socialism. However, the experience of Green parties in Europe has shown that changing politics in this way is very difficult. Nevertheless, the book contains interesting ideas and suggestions for developing new (hopefully more successful) conservation strategies.

Angela Meder

Christophe Boesch and Roman Wittig (eds.)

The Chimpanzees of the Taï Forest. 40 Years of Research. Cambridge (Cambridge University Press) 2019. Hardcover, £ 79.99. ISBN 978-1-10848155-7

Alison M. Behie, Julie A. Teichroeb, Nicholas Malone

Primate Research and Conservation in the Anthropocene. Cambridge (Cambridge University Press) 2019. 64 illustrations, 24 tables, 310 pages. Cambridge Studies in Biological and Evolutionary Anthropology. Paperback £ 34.99, ISBN 978-1-31661021-3. Hardcover £ 64.99, ISBN 978-1-10715748-4

Adam Clark Arcadi

Wild Chimpanzees. Social Behavior of an Endangered Species. Cambridge

(Cambridge University Press) 2018. 18 illustrations, 7 tables, 244 pages. Paperback £ 24.99, ISBN 978-1-31664756-1. Hardcover £ 57.99, ISBN 978-1-10719717-6

Marc Languy

The Birds of Cameroon. Their Status and Distribution. Tervuren (Musée Royal de l'Afrique Centrale) 2019. Studies in Afrotropical Zoology Vol. 299. 567 pages, about 500 colour photos, 954 distribution maps. Paperback, £ 34.99. ISBN 978-949266958-2
https://www.nhbs.com/the-birds-of-cameroon-book?fbclid=IwAR3djXjR7vs43ReysNs4isLC1goyoD8Jzgh9F1xuGNhD_Ap0xIhkUOXnjZ8

New on the Internet

UN Security Council

Letter dated 6 June 2019 from the Group of Experts on the Democratic Republic of the Congo addressed to the President of the Security Council. June 2019. S/2019/469. 150 pages. Download PDF (13 MB): <https://undocs.org/S/2019/469>

UN Security Council

United Nations Organization Stabilization Mission in the Democratic Republic of the Congo. Report of the Secretary-General. September 2019. S/2019/776. 17 pages. Download PDF (703 kB): <https://undocs.org/S/2019/776>

Elizabeth Green, Louise McRae, Mike Harfoot, Samantha Hill, Will Simonson and Will Baldwin-Cantello

Below the Canopy. Plotting Global Trends in Forest Wildlife Populations. 42 pages. Download PDF (3.35 MB): <https://www.wwf.org.uk/sites/default/files/2019-08/BelowTheCanopyReport.pdf>



BERGGORILLA & REGENWALD DIREKTHILFE

Our Donors

From May to October 2019 we received major donations by Marco and Lisa Arendt, Andreas Aschentrup, Fredrik Bakels, Emilio Garcia Barea, Katrin Baumann, Torsten Becker, Johanna Berger, Manuel Blatter, Heinz-Adolf Böckmann, Hartmut Brandtmann, Michael and Marie Buschmann, Buttwrap GmbH, Achim Christen and Rita Christen-Stuttgen, Axel Clemens, Michael and Odile Datz, Christine Dedert, Herbert Dehmel, Angelika Dickmann, Daniel Edler, Winfried Eisenberg, Caspar Florens v. Cornsbruch, Jürgen Friedrich, Gorilla Gym Hamburg, Birgit Grimm, Dorothee Heuermann, Birgit Höfer, Gabriele Huck, Helga Innerhofer, Michael Jähde and Angelika Jähde-Stoeckle, Volker Jährling, Susanne Jaros, Petra Kernberger, Engelbert Kinds, Helga and Michael Lange, Mareike Laub, Ulrike Letschert, Isabella Löber, Joachim Maier, Dieter Marten, Angela Meder, Hermann Meinhold, Michael Möhring, Klaus Nottmeyer, Brigitte Otte, Edith Otte, Hanna Otte, Karsten Otte, Ralph and Irina Otte, Manfred Paul, Monika Pöhler, Janos Rave, Birgit Reime, Ullrich and Barbara Richter, Wolfram Rietschel, Mithra Roßmann, Alfred Roszyk, Michael Rücker, Erika Rüge, Steffen Schatz, Volker Schiek, Dirk Seel, Michael Schmidt, Eberhard Schmucker jun., Stephanie Skolik, Sparkasse Herford, Hartmut Stade, Michaela Steinhauser, Norbert Stroh, Peter Stroh, Tiergarten Heidelberg, Tipp4, Horst and Margot Uhel, Florian von Rücker, Martin Von Vulte, Andreas Wiebe, Christof Wiedemair, Wilhelma, Martin Witte, Brigitte Wullert, Rebecca Zindler and Zoo Milwaukee.

Karsten Otte, Volker Jährling and Norbert Stroh asked the guests of their birthday parties to donate to us instead of bringing birthday gifts.

We thank everybody who has been supporting us!



Berggorilla & Regenwald Direkthilfe information for visitors of the "Late Zoo" in Hannover

Photo: Burkhard Bröcker



Species conservation day at the Stuttgart Zoo with information material by Berggorilla & Regenwald Direkthilfe. We also presented gorilla drawings that were coloured by children – interestingly, many adult used this opportunity too.

Photos: Angela Meder