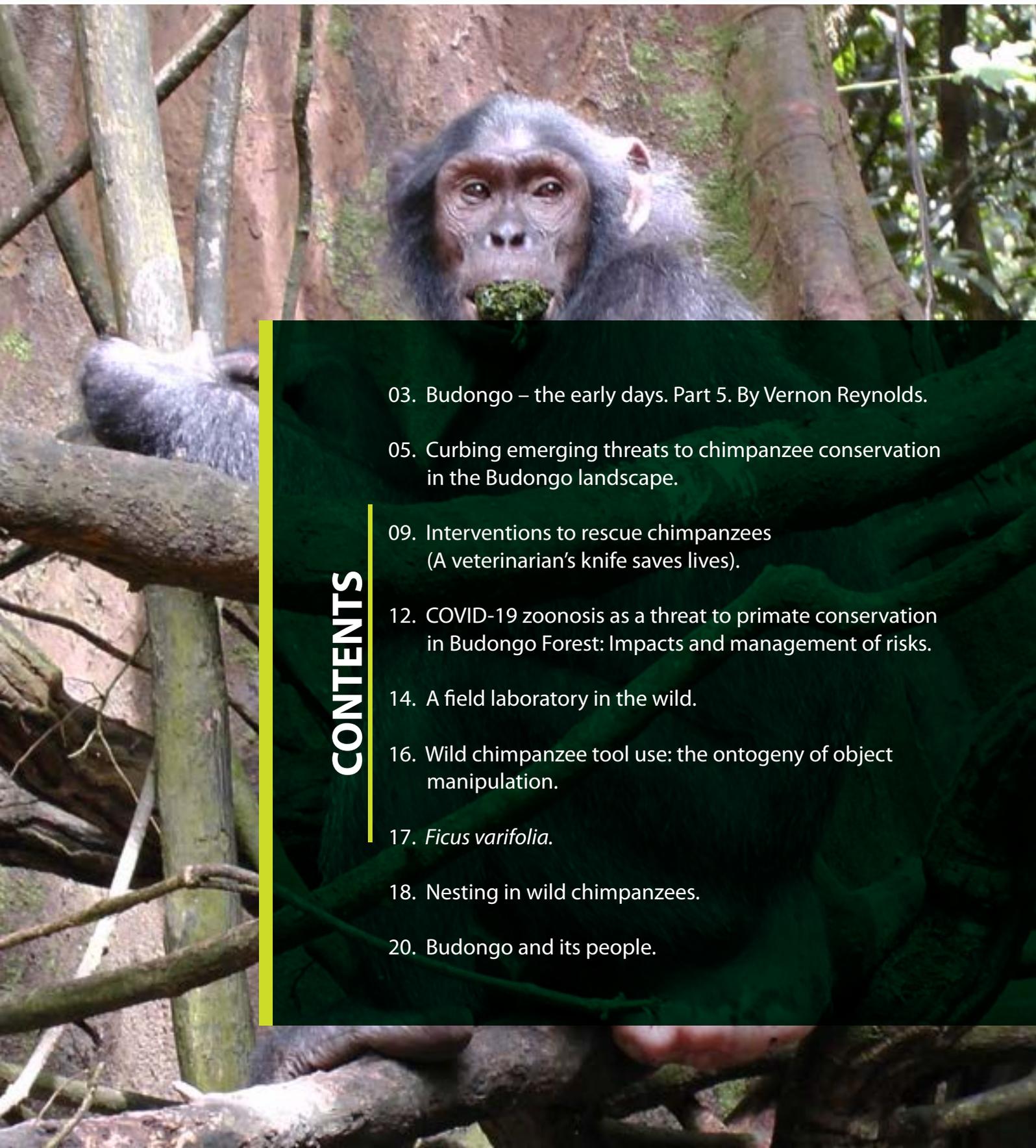




# BCFS News

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Blending Research and Conservation for  
Sustainable Natural Resource Management



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## FROM THE EDITOR

For most of the year 2020, Uganda like many other countries across the globe has been grappling with the much-dreaded novel Corona virus. It has been and continues to be a difficult time framed by fear of an uncertain future. At Budongo Conservation Field Station (BCFS), much as we were concerned about our wellbeing (health wise), our concern about the health and wellbeing of the chimpanzees in the Budongo landscape could not be overlooked. What could go wrong if COVID-19 crossed to chimpanzees? A deep fear we often tried to silence but we were certain we needed to do all we could to protect the chimpanzees. This called for lot of sacrifice and investment by the field teams (including staying away from their families and the comfort of their homes for months) in an effort to keep the wildlife especially the chimpanzees safe. Yet, the glaring threats from other human induced causes even seemed more prominent. Many community members turned to the forest for their livelihood as many of their economic activities were brought to a halt following a nationwide lockdown. Poaching seemed like the new normal. We realized a record high in the number of snares/traps confiscated from the forest in 10 years (<http://www.budongo.org/news/illegal-activities-in-bfr-during-covid-19-pandemic>).

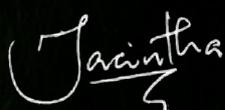
In this issue of our newsletter we get to discuss various threats to chimpanzees including COVID -19 and how we are and have been able to cope. The beginning of year, 2020 also saw our long time Field Station Manager Mr. Geoffrey Muhanguzi retire from his formal service as BCFS Field Station Manager after over ten years of dedicated service. Mr. Muhanguzi gets to share some of his most profound memories at Budongo and the future he hopes to see. It is not all gloomy since Prof. Vernon Reynolds continues with the stories from the early days with a pinch of great humor. For these and more stories enjoy your read and follow us on our Facebook (Budongo Conservation Field Station) and Twitter (@BudongoChimps) handles for more updates.

On behalf of the team at BCFS and on my own behalf, we wish you and yours the very best of the year 2021 and we hope that you continue to keep safe.

Keep hope alive! As one of our colleagues Zephyr Kiwedde likes to remind us.

Cheers,

Jacintha N. Lwebuga



BCFS Communications Coordinator



*Old houses before renovation*

## **Budongo – the early days. Part 5. By Vernon Reynolds**

### **Staff housing**

**I**n the last issue of the Newsletter I told the story of how Jake was nearly killed by electricity when he was renovating the roof of our camp HQ, the house we unimaginatively called “House 1”. Well, fortunately he survived and could then turn his attention to renovating the staff houses which were in a terrible condition. Jake put together a team of builders with Richard Odong Too in charge. The first job was to pull the old ruins down. Meanwhile Jake and Richard drew up a plan for a brand new set of houses that our staff would be happy to live in. they would be made of bricks, with cement floors and painted iron sheet roofing. Top of the range! We were lucky: USAID provided the money for the houses.

First of all the foundations had to be laid. Trenches were made and filled with hardcore. Most of the materials were locally sourced. The sand came from a place Richard knew near the lake. Bricks were locally made. The main expense was that the cement had to be bought and Richard insisted on getting high quality cement. He said you could get cheap cement but it would be no good, so it was worth buying good stuff. I made two visits a year to camp in those days, staying 3-6 weeks, and I was there during the house building. It was a time of great activity with the beaten up old truck roaring into camp each day full of building materials and our team of builders. No time was wasted, the bricks were thrown from man to man and other materials, wood and sand, formed piles all around.

When the trench for the foundations had been made a ceremony took place. I heard about it afterwards, apparently a chicken was sacrificed at one corner to bring good luck to the house. I guess they didn’t invite me to watch this in case I felt sorry for the chicken.



*Unloading bricks*

Quite soon the walls started to rise up, windows were made and put in place, doors fitted, floors of cement screed were laid down and finally iron sheets were brought in and put in place. What a beautiful sight the new staff houses were! Two sets of six rooms each, forming a right angle at the edge of camp. A choo was needed and was duly built.

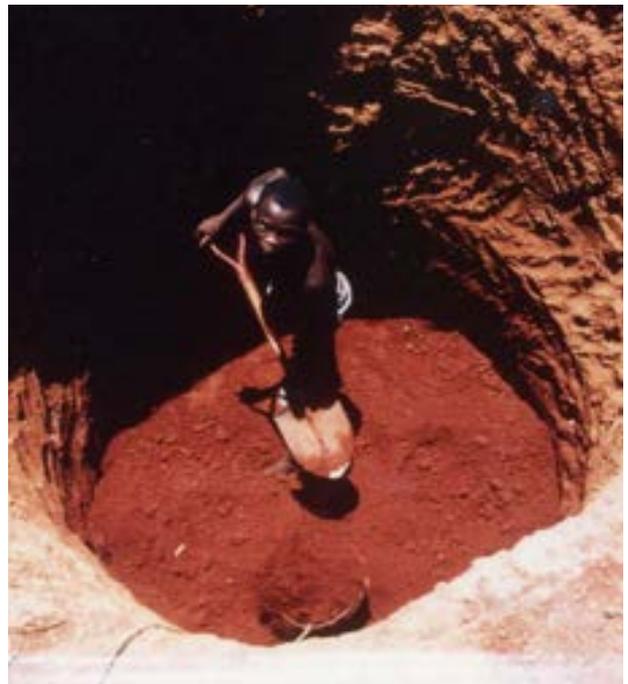
Staff were eager to move in: men with their wives and children. A joyous atmosphere prevailed as the new Budongo way of life came into being. But there was just one problem. My own room was in House 1 and during the night I sometimes heard some sharp bangs. At first I feared we'd been attacked by rebels but after the bangs it all went quiet again so I went back to sleep. Every night was the same: Bang! Bang! Staff morale started to go down, people wandered around in the daytime like zombies. Were they killing each other at night? Then I found out. There was a huge fig tree at the forest edge on the north side of the new houses; it was nice because it gave good shade.

But one big branch hung over the roof of the staff quarters. The tree was in fruit and every now and then a fig dropped down with a bang like a rifle shot as it hit the iron sheet below. Staff couldn't sleep. Something had to be done. The tree had to go.

There was a certain man living in the nearby village of Nyakafunjo, let's call him Mr Sure Thing (I won't give his real name). Now this Mr Sure Thing had years of experience of felling trees and could bring one down with precision, exactly in the right spot.

It was vital that the tree fell towards the forest to avoid any risk of damage to the new houses. Mr Sure Thing gave us the guarantee we needed. He would bring it down away from the houses, into the forest. The day for the tree felling arrived. Mr Sure Thing was the brains behind the operation; he left the actual sawing to his young apprentice. Two ropes were attached to the tree to pull it into the forest.

The chain saw started up and I watched apprehensively as a large cut was made into the base of the tree on the side closest to the forest. Deeper and deeper went the cut but the tree still stood firm. Men inside the forest were pulling the ropes to get it to fall towards them. At last it began to move, slowly



*New choo*

at first but with ever greater speed, falling towards the forest just as Mr Sure Thing had predicted, pulled by the two ropes. And then, as it fell, the weight of that big branch over the houses seemed to exert a counter-pull, the ropes suddenly went slack, everyone started shouting, the mighty tree swung round, and it crashed into our lovely new houses, buckling the iron sheets, breaking the roof timbers, and smashing down the walls.

I let out a mighty yell, found words in my vocabulary I had not used for many years, and went purple in the face. Jake was there, and Janie too, and they feared I'd have a heart attack. So they ushered me back to my room in House 1 where Jake calmed me down and said it wasn't too bad, there was nothing that couldn't be repaired. Slowly I regained my composure. But I lost it again the next day when Mr Sure Thing came to see me and asked to be paid for his work! I'm afraid my vocabulary plumbed new depths and the men standing around heard several words they'd never heard before.



## Curbing emerging threats to chimpanzee conservation in the Budongo landscape.

By Dr. Caroline Asiimwe; BCFS Conservation Coordinator and Head Veterinarian

**B**udongo landscape is located within the Albertine Graben, a biodiversity hotspot in Uganda. It is a significant conservation area that consists of Budongo Central Forest Reserve (BCFR), and many forests fragments, whose conservation value is derived from their previous connectivity with the main Budongo Forest block, and consequently sharing species of conservation importance. The Budongo landscape supports diverse flora and fauna of global and national conservation concern including the endangered chimpanzees (*Pan Troglodytes*).

Despite being a biodiversity hotspot, the Albertine Graben at large is faced with many threats. Many if not all of the current threats to biodiversity in this area can be traced back to the large and expanding, rapacious and technologically advanced human population. Yet the majority of the population living within Budongo landscape is economically deprived which heightens their dependence on forest resources especially for fuel (energy resources), building materials, food and medical resources among others.

Human activities such as heavy fuel consumption, natural resource extraction and commercial farming though seemingly lucrative, have negative consequences. Wildlife is continuously deprived of their life requisites by impoverishing their surroundings and survival resources. This often forces the wildlife to explore resources outside their home range which results in human-wildlife conflicts and associated consequences.

The threats are not static but rather dynamic and complex in nature and vary in different localities and are thus eminent challenges to sustainable management of viable chimpanzee populations, habitats and ecosystems. One of the earliest accounts of the community use of Budongo Forest, Eggeling, and eminent forester in Budongo's history described Budongo as a forest shunned by the locals. Exploitation of Budongo Forest for timber production from the 1930's therefore provided the first significant challenge to the conservation of Budongo Forest.

### **Threats to Chimpanzees**

Chimpanzees are iconic species of conservation importance, for which Budongo landscape contributes significantly to the numbers conserved in Uganda. Chimpanzees occupy Budongo Central Forest Reserve (BCFR), and a number of forest remnants and fragments within the Budongo landscape. However, apart from the BCFR, all the other forest remnants and fragments in the Budongo landscape have a chimpanzee population that is classified as not viable and their local extinctions may only be avoided for so long.

A chimpanzee population in an area is considered viable if it has at least 500 individuals. Previous surveys in the area have revealed that in the Budongo landscape, only BCFR has a viable population of over 800 individual chimpanzees. All the other forest remnants and fragments were reported to have population size estimates between 200 and 350 individual chimpanzees. Chimpanzees are ecologically significant species.

By their large size, they play important ecological roles that only a few, if not no other species play. For example, in seed dispersal of important large seeded tree species. Their proximity in genetics, form and structure, and behaviour makes them animals of awe to the scientific and ordinary mind. And the tourism and economic potential significance. Culturally, they inform the cultures of many communities in Uganda, and therefore contributing to Uganda's national identity.

Threats to chimpanzees in Uganda and particularly in the Budongo landscape have been in existence for centuries. According to Professor Vernon Reynolds, in 1990s some chimpanzees confiscated in Europe were traced back to Budongo Forest, a place where he had done his research in the early 1960s (Reynolds, 1965). Back then, hunting infants for pet trade and bush meat were the main threats affecting the chimpanzees. Hunting of wild game such as antelopes and bush pigs to obtain bush meat threatened chimpanzees of all ages as indiscriminate methods (wire and nylon snare traps and pit-fall traps) were used and often chimpanzees were accidental victims. The natives in this region, the Banyoro, were not eating chimpanzees and thus all entrapped chimpanzees were accidental victims and were left to die if found in traps but a few lucky ones struggled until their strangled limbs fell off leaving them with permanent mutilations. For example, in the 1990s, the Sonso chimpanzee community in BCFR had at least 20% of its population with snare mutilations. Back then, veterinary interventions on apes were not popular leaving nature to take its course. This phenomenon was later opposed by biologists arguing that human caused injuries require interventions. At the same time, the biggest timber milling industry in the country was still functional and tree cutting was mainly selective and legally conducted. Since there were no studies conducted to evaluate the impacts of saw-milling on the welfare of chimpanzees then, the magnitude of this threat was uncertain.

However, later on in 1995, the recommissioning of the Kinyara Sugar Factory heightened the threat of habitat loss and degradation as the human population and demand of agricultural land increased. The influx of people from various regions into the Budongo landscape in search for jobs and an opportunity to grow sugarcane on a commercial scale led to an exponential population growth and high demand for land for settlement and agriculture. Furthermore, the recent discovery of oil in the Bunyoro region (of which Budongo landscape is a part) exacerbated this problem as new immigrations into the area were recorded. The need for more land for agriculture for the ever expanding human population has increased habitat loss, degradation and fragmentation of many forests in the country and particularly in the Budongo landscape. It is believed that Uganda could currently be exhibiting the highest deforestation rate in Africa of about 2.2% annually. According to the new vision of 9th May 2019, Uganda is estimated to loss about 90,000 hectares of forest cover every year and most of these are among the 70% of Uganda's woodland and forest occurring patchily outside the protected forests on private and communal land. The anthropogenic changes; i.e. habitat loss, degradation, fragmentation and other land use changes are inducing climate changes, biological homogenization and disease dynamics of human origin into wild apes.

In the face of such drastic environmental changes, species have started to exhibit diet change, variation in life history and changes in population growth rates. For example, in Budongo Forest, the Sonso chimpanzees have been observed to shift from being 90% to 60% frugivorous, a change whose health and welfare repercussions are not yet known. Additionally, more animals including primates have been observed to move into human settlements to find alternative feeds which has exposed them to agrochemicals and diseases. With increased human interaction comes the devastating human wildlife conflict that has left many lethal impacts on both chimpanzees and humans.

In the recent past, disease threat to chimpanzees has been the most notorious of all threats.

Of particular concern has been respiratory infections, most of which have been traced back to human origin. For example in 2019, the Sonso and Waibira chimpanzee communities of Budongo forest suffered a terrible respiratory infection outbreak which claimed four chimpanzees and over 90% infection rate. Given the recent trends in Uganda, respiratory diseases seem to be only second to habitat loss and degradation among threats to chimpanzee conservation. In addition to these threats, road kills are on a rise as more infrastructures are being developed across the country. While roads are needed to improve access to social services, most roads pass through chimpanzee habitats fragmenting them and making crossing from one side to the other difficult especially on roads with high traffic. This infrastructure development has cut off connectivity between chimpanzee communities impacting on the genetic pool and consequently disease transmission through increased contact with human populations.

The current COVID-19 pandemic has indirectly worsened the existing chimpanzee threats. Although no chimpanzees have been reported to be positive of COVID-19, poaching has increased tremendously during this period. But since chimpanzees have a long inter-birth interval of averagely 5 years, any natural or man-made distortion in their ecosystem could adversely impact on their behaviour, biology and general welfare.

### **Curbing threats and the associated challenges**

Budongo Conservation Field Station alongside a number of other stakeholders implements various strategies to curb the many threats to chimpanzees and the natural resources at large. Chimpanzee health monitoring, patrolling to detect and remove threats before harm is inflicted on the chimpanzees, conservation education, research, tourism and law enforcement are some of the deterrents to illegal activities. However, in the event that the mitigation strategies are not timely or sufficiently effected, entrapped chimpanzees have been successfully saved by veterinarians where circumstances allow.

Despite all that is being done to curb the threats, the complexity of some of the associated challenges in making an effort to conserve nature cannot be undermined.

In the Budongo landscape, the greatest challenge has been the discord in the governance of the central forest reserve and the decentralisation of the forests outside protected forests.

Focusing on Budongo Forest as an example, the chimpanzees are under the protection of Uganda Wildlife Authority (UWA) while the forest is under the protection of National Forest Authority (NFA). These two bodies have discordant mandates; while one focuses on conservation, the other focuses on production. This has really created a big challenge in the management of the welfare of chimpanzees. Then we have forests outside the protected forest estate which also inhabits chimpanzees, who protects them? The forests are diminishing rapidly and chimpanzees are being left homeless with no choice but to rely on human feeds and compound trees for shelter.

There is also lack of political and cultural support toward biodiversity conservation. Just recently, conservationists were struggling to convince the government of Uganda that building a dam on Murchison falls in Murchison Falls National Park would endanger many species including the chimpanzees. However, in late November, 2019 the government announced that it would allow an international consortium to explore the feasibility of a 360-megawatt hydro plant in Murchison Falls National Park (<https://www.independent.co.ug>). Another heartbreaking scenario is the preference of sugarcane growing to forest conservation. The government supports investors to cut down part of Mabira forest in favour of sugarcane growing and most recently, the Bunyoro Kitara kingdom supported by Uganda High court supported the leasing and clearing of over 8000 hectares of Bugoma Forest Reserve for sugar cane growing (<https://witnessradio.org>). Amidst all the challenges, as conservationists we continue to do our level best to mitigate threats to wildlife and natural resources to the best of our abilities.

## **Opportunities and prospects of the future**

Some of the challenges arise from poverty, and people seeking to address the household livelihood means. Without addressing and providing alternative means of livelihoods, communities are bound to continue to provide a significant challenge to chimpanzee conservation.

First, and foremost, there is need to address land use and land use planning to cater for both commercial and subsistence farming coexistence. Land needs to be secured at household and community level to ensure sufficiency for food production, to address food security needs. But also, that land use practices compatible with and addressing the challenge of presence of primates will be critical to curbing the threats.

Community education provides an important advocacy tool. Different approaches can be used to address knowledge gaps, improve attitudes, and empower communities to deal with the challenges of primate conservation. For example, knowledge of vulnerable crops, and behavioural aspects of crop raiding animals, especially primates, can empower farmers to minimize losses, or explore alternative cropping to manage damage from raiding primates. On the other hand, formal educational opportunities for communities in the Budongo landscape is pertinent in creating a conservation conscious mindset, but also critical for creating human skills necessary for the management of natural resources.

Illegal activities in the forest are usually carried out by able bodied youth, with lack of livelihood opportunities. Providing alternatives through skill development provides an important route for engaging youth in income generating activities and diversifying livelihoods. For example, artisan skills such as brick laying and concrete practice, welding, hair dressing provides you with skills for community development, providing critical labour to development activities such as house construction in the developing urban settlements. Commercially more viable agricultural options can also become an important part of the necessary interventions, for example, high value crops that can significantly improve household income.



*BCFS and RZSS staff interacting with pupils and staff of Karongo Primary School in Budongo Sub-county. Community education provides an important advocacy tool.*

Restoration of especially forest fragments is important for addressing the challenges related to ecological capacity of these ecosystems. Illegal activities have affected the tree population, and will be an important problem into the future of primate conservations. Protection shouldn't only focus on chimpanzees in protected forests but also on those outside protected forests. Yes, the populations and habitats of chimpanzees outside protected areas are not viable however what seems obvious is that once these forest fragments are depleted, the illegal harvest will shift its burden onto the "protected" forests. An intervention to plant desired tree species important to conservation of primates in major forest blocks and fragments the ecological capacity to sustain populations. Furthermore, small fragments may not be sufficient to sustain communities. Tree planting in the communities and between fragments provide options for restoring connectivity. Tree planting on communal lands should also provide an option to address tree product needs of communities, within the communities, reducing pressure on natural areas. Moreover, this will further provide restoration opportunity and connectivity between fragments, important in maintaining reproductive viability of chimpanzees.

Health monitoring among primate populations is an important consideration in addressing some of the threats to primate conservation, especially the zoonosis. Health monitoring is currently implemented across the Albertine rift, and focussing on chimpanzees. The process involves daily collection of observational data that alerts to any novel scenarios

and eventualities. Furthermore, the health monitoring aspects encompasses collection of information on threats to primate, for example presence of hazards of possible impact on life of primates. An example is the snare removal program, becoming popular among many primate conservationists and in need of further expansion, identifies and removes materials potentially injurious or lethal to primates, reducing the risks. These efforts would benefit from expansion, especially of the veterinary teams needed to respond to address the consequences of these challenges, for example through an intervention.

Scientific research to quantify potential impacts will empower scientists and decision makers to rise to and develop strategies to mitigate the impacts of these changes. Scientific research for example on impacts of climate change, potential zoonosis and their risks, information on potential approaches to manage the risks are pertinent, and important tools for current conservation efforts.

Due to competing interest over limited resources, law enforcement will become, and urgently needs to be made an important component and opportunity in sustaining the objectives of natural resource management, including primate conservation. An effective means of law enforcement, incorporating the corporation of nearby communities, will be pertinent in addressing illegal activities and their consequences. Local communities whose livelihood depends much on the forest resources should be at the forefront of the initiatives geared towards conservation of forests and the wildlife therein.

## INTERVENTIONS TO RESCUE CHIMPANZEES (A veterinarian's knife saves a life)

By Dr. Timothy Mugabe, BCFS Veterinarian

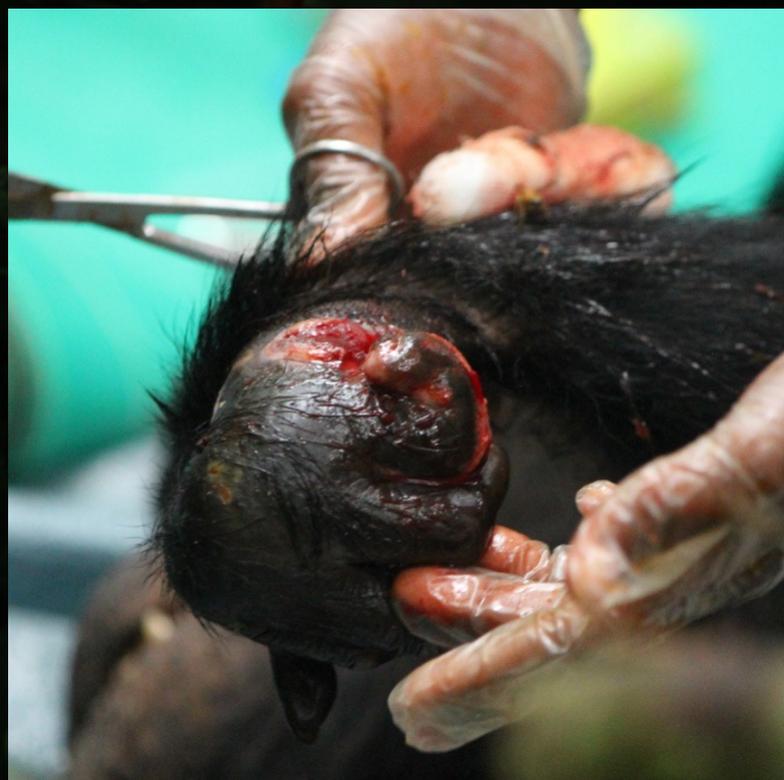
Primate conservation in the wild is faced with many threats among which are: habitat loss and degradation, emerging zoonotic diseases, human wildlife conflict, climate change, and poaching for bush meat and animal trade. Poaching remains an important problem, has historical roots, and is linked to the traditional way of life and means to acquire meat among many communities. In the Albertine Rift, poachers usually set traps in forests and parks to trap antelopes, wild pigs and other wild animals mainly for food consumption. However chimpanzees often fall accidental victims of these traps. In the Budongo and Kibale landscapes, the major traps used are; wire and nylon snares and the deadly bear trap commonly called the mantrap. On many occasions, trapped chimpanzees become permanently maimed (especially when no timely intervention is done to remove the snare). This often disadvantages the victims in their community. For example most of the females that get maimed fail to successfully raise their infants while the males often cannot favourably compete for mates and food thus restricting or preventing their contributing to the gene pool. Yet, over 20% of the chimpanzees in habituated communities in the Albertine Rift region have been maimed or have scars attributed to snares. In addition to these, a significant number of snared chimpanzees lose their lives to snares and mantraps especially when no or late interventions are done.

The increasing threat from poaching continues to negatively impact on the already endangered population of chimpanzees in Albertine Rift. This qualifies the need for interventions and the consistent monitoring of the health of chimpanzees for early threat detection to minimise the negative impacts of poaching as an effort toward protecting the remaining viable populations of chimpanzees. Through the chimpanzee health monitoring program, Budongo Conservation Field Station in partnership with various

stakeholders such as the Jane Goodall Institute (JGI), Uganda Wildlife Authority (UWA), National Forestry Authority (NFA), Chimpanzee Sanctuary and Wildlife Trust (CSWCT) and other partner conservation and research organisations, a number of interventions have been and would be conducted to rescue chimpanzees from traps in both habituated and non-habituated chimpanzee communities in the Albertine Rift region. Interventions in this scenario refer to a human involvement to support and alleviate pain or reduce the impact of a negative occurrence (often inflicted by man) on a wildlife animal species.

### When and when not to intervene

A snare/ mantrap removal intervention is an extremely technical, laborious procedure that is often risky to both the chimpanzee and the intervention team. Therefore interventions are considered cautiously. An intervention is only justifiable when the victim's welfare is better served by treating than not treating or if the chimpanzee is unlikely to recover without treatment.



For example, it is considered an emergence when a chimpanzee is entrapped in a man-trap (bear-trap) or when its neck or head is caught in a snare. Unfortunately even when an emergence intervention is required, it might still be impossible to execute. An example is *Kefa*, a 6 year old male of the Sonso chimpanzee community in Budongo Forest. Despite being ensnared on the face, an area that would qualify for immediate intervention, an intervention has been impossible because he is dependent on the mother who is a shy and rare female. Thus such an intervention would require sedating his entire family creating a bigger risk than if *Kefa* was monitored till he is independent to enable intervention.

Interventions would still be avoided or delayed when for example a snare victim is; heavily pregnant, a high ranking member of the community (they would often be in company of many members of their community which would expose the intervention team to high risks), has physiological anomaly such as kidney or liver disease or has a very young dependant. Such circumstances would render an intervention unjustifiable, an added risk and cause of stress.

### **The rescue process**

Upon receiving information of a suspected snare victim by the veterinary team from field assistants/ rangers or forest edge communities, an experienced team

is sent ahead (especially in case it's the forest edge community reporting), to confirm whether the animal is indeed a chimpanzee and is still alive. The field team is tasked to continue to closely monitor the snare victim until an assessment is done by the veterinary team. Following a visit to the scene and depending on the veterinary team's assessment, a decision is made to either intervene or not to.

Once the veterinary team decides to go ahead with the intervention, the Uganda Wildlife Authority is contacted to send a team to work with the veterinarians as well as offer security in the unlikely event that other chimpanzees retaliate against the intervening team. The intervention process usually requires a minimum of four people (A veterinarian, an assistant, field assistants and rangers). Each member on the team is assigned a role to avoid confusion and delays while the chimpanzee is under anesthesia.



*Dr Mugabe Timothy (BCFS Veterinarian) and Dr Aruho (UWA) Robert examine a female chimpanzee from Sebitoli chimpanzee community that had been knocked by a motor vehicle along the Fort-portal - Kampala highway.*

Anesthetic drugs in the wild are estimated and delivered to the animal through a dart in a darting gun/pistol. The reaction of the darted individual cannot be predetermined as anesthetics don't cause immediate effect (takes between 5-10 minutes on average for the snared chimpanzee to get the full anesthetic effect). For instance, an animal can be darted on ground and it climbs high in the tree and worse still makes a nest. In such a scenario, the protocol of how to get the animal down from the tree or nest is a story for another day but fast forward, the animal is safely brought back to the ground.

This justifies why the team is usually much bigger than what would be the case in captive setting interventions. Once the animal is down, weight is taken and rectifications on the anesthesia dose administered are done by either adding or reversing in case of underdose or overdose respectively. The wire, nylon or man trap is then tactfully removed and the inflicted wound treated accordingly before reversing the anesthetic drugs.

The team stays on site monitoring the recovery process but also to offer protection to the animal during this vulnerable state. During such interventions, Veterinarians get an opportunity to invasively collect samples such as blood and swabs as well as take physiological and body index measurements.

### The intervention process

For both the southern sector (Kibale Conservation Area and Queen Elizabeth Conservation Area) and the northern sector (Budongo and Bugoma Central Forest Reserves Conservation Area), a number of attempts for a snare removal intervention have been made over the years as a number of chimpanzees fall victim of snares and other hunting equipment. Yet it often takes more than one attempt for a successful intervention. A number of attempts have been successful, some are in waiting or on hold and some others failed.

For example for *Squibs*, an adult high ranking male of the Sonso chimpanzee community in Budongo Central Forest Reserve, or *Byezingire* a sub-adult male of the Kanyanchu chimpanzee community, it took three months before a good opportunity for a successful intervention presented itself. For *Klaus*, now a sub-adult male of the Sonso community was first snared in November 2018, his snare was successfully removed and his toes were all saved.

Unfortunately, one year later, he suffered a second snare injury on the fore limb. However attempts to intervene have been unsuccessful to date as everytime he sees anyone closely monitoring him, he climbs very high up the tree making intervention impossible. Could it be that the saying “once beaten twice shy” is what is happening in this case? Well, this is an assumption we have drawn though the data set is too small to draw confident conclusions.

### Conclusion

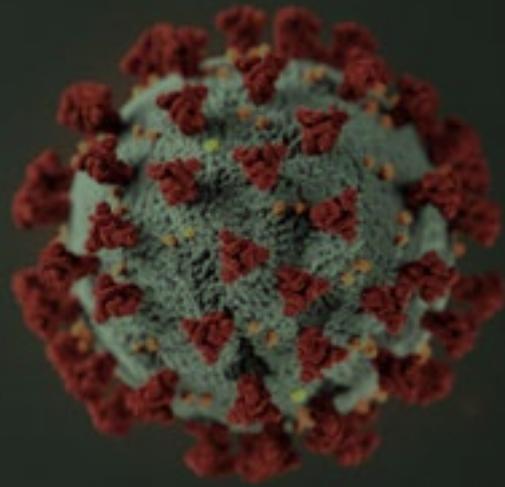
Interventions to rescue chimpanzees require quite a lot of investment in terms of personnel (their skill set and expertise) and time (may in some instances stretch for months), yet every so often the success of an intervention may be left to luck leaving many chances for snare victims to be resigned to a marginalised life in their communities. It is therefore important to prevent snare injuries from occurring before they occur. For this reason, chimpanzee conservation strategies such as snare removal programmes and community livelihood programs in which hunters are convinced to stop hunting and provided with alternative sources of livelihood are strongly recommended. In addition to these growing a cadre of skilled and able veterinarians is important and as such BCFS encourages and takes its role in wildlife veterinary training seriously.



*Klaus a sub-adult male chimpanzee in the Sonso community had a snare successfully removed from the digits on his left hind limb*

## COVID-19 zoonosis as a threat to primate conservation in Budongo Forest: Impacts and management of risks.

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Zoonotic diseases, also referred to as zoonoses, are among the major emerging diseases of global concern. Zoonotic diseases are caused by pathogens (can be bacteria, viruses, fungi or parasites) that spread between humans and animals, or between animals. Reverse zoonosis, or anthroponosis, refers to a situation in which humans infect animals. The Center for Disease Control, USA, estimates that 3 out of every 4 emerging diseases are of animal origin. However, although a majority of human diseases are of animal origin, it is those that involve non-human to human transmission that are considered direct zoonosis of public health concern. Transmission of zoonotic diseases takes place through different modes, including through media such as air, saliva, urine, feces and bites; and through intermediate vectors that act as a reservoir of the disease, but without getting sick. Examples of zoonotic diseases of global health concern include malaria, Ebola, tuberculosis, sleeping sickness, yellow fever, among others.

Zoonotic diseases provide a formidable challenge to primate conservation. Biological similarity between humans and non-human primates predisposes primates to cross-species disease transmission. The shared genetic proximity between humans and non-human primates require that are vulnerable to human diseases. Novel zoonosis is of particular concern, as the body's immune system may fail to cope with its presence. Moreover, human modification of the environment has brought humans ever much closer to primate habitats.

Furthermore, effective approaches to primate conservation, such as habituation for research and ecotourism, have further brought different groups of people closer to the primates. The consequence of this has been episodes of respiratory outbreaks among primate populations.

Respiratory zoonosis has been, of recent, of concern in sub-Saharan Africa, the global center of wild primate conservation. The consequences of these outbreaks have varied from mild to severe, to lethal cases. The advent of COVID-19 as a global pandemic has therefore added to the repertoire of challenges to address in primate conservation.

COVID-19 being a novel zoonotic, the optimal response remains to be discovered. Current evidence, from molecular biology, shows a high potential of transmissibility of COVID-19 from humans to the primates and so far, the confirmed cases of gorillas with COVID-19 in a USA zoo attests to this risk. Preventing contact between high risk individuals and primates, or primate environment therefore seems to be the most sought-after option, yet it remains impractical in some circumstances. Landscape differences in the response remains pertinent. While some sites have the opportunity to carry out strict regulation of access and quarantine, these desired precautions are impractical in certain landscapes. Complete isolation and quarantine are possible where a given stakeholder(s) has total control over of access to the primate conservation



site. In other sites, this level of control is impractical, and middle ground solutions become the only feasible option. Budongo Forest primate conservation sites present with this challenge. Whereas the threat of COVID-19 to primate conservation portends great risk; the social and economic impact of the restrictions it brought about equally exacerbated some of the threats to chimpanzee conservation. In Uganda, the lockdown imposed significantly impacted the livelihood options of many households and individuals. For forest edge communities, there was a significant disruption of livelihood activities, and loss of sources of income other than those from agricultural crops. Moreover, limited market access also meant that the sale of some agricultural produce was restricted, further constraining the farming households. Consequently, around Budongo Forest landscape, and in other protected areas, incidences of illegal forest access and utilization increased. Illegal charcoal burning, pit sawing and wildlife snaring accordingly increased.

Where control of entry to the protected area cannot be secured and tightly manned, increased risks from other threats therefore necessitates finding a middle ground. If human presence directly acts as a deterrence to illegal forest access and to forest degradation, increased presence of groups with positive outcomes may need to be sustained. For Budongo Conservation Field Station (BCFS), in Budongo Forest, access to the forest by community members could not be regulated.

There is no institutional arrangement and capacity to implement an effective restriction of access. We are equally aware that community livelihood, especially wood fuels and water resources are derived almost exclusively from the forest, making regulation even more challenging, considering the sporadic nature of access to these resources.

At BCFS our initial approach was to implement a total lockdown for staff, with only occasional and limited access to public areas to acquire food items. We still consider this an important decision on the occasion of that time, considering that the epidemiology of COVID-19 was poorly understood, and clarity on how it would spread was only being sought. We therefore maintained, for ten weeks, only a critical number of staff isolated at the station to continue with critical wildlife monitoring, especially to report on the conditions and status of the primates, but also to secure some of the long-term research interest, in a relatively safe manner. However, one of the benefits of research establishments and ecotourism sites in conservation is that they deter illegal forest users from accessing sites conducting such activities. While we were cognizant of continued community use of the forest, we had not immediately anticipated increased forest access by the community. Our reduced presence, however, was noted by those intending to carry out illegal activities in the forest. Around the research grid, we immediately noticed an increase in the number of snares, and the first major alert was when we encountered a chimpanzee on a snare. Subsequently, two duiker species were rescued from wire snares within the research grid area; and many unusual (increased) patterns of snare recovery by the field research team, in addition to heightened recovery by the levels per work effort for the snare removal team.

As a tradeoff, we therefore opened up the station to all staff, but while taking the necessary precautions. For example, all staff who arrive for work at the station have their temperature taken, and global COVID-19 related hygiene practices, such as hand washing and sanitization, have been enhanced. Furthermore, wearing masks during meetings has become common.

Staff following chimpanzees portends greater risks to primates, and they do wear masks when following chimpanzees, strictly change field clothing, and stay at the station to minimize contact with the public. In addition, the number of staff meetings and gatherings is minimized, and equally are the amount of contacts between the different sections of staff.

The international Union of Conservation of Nature (IUCN) has produced very useful guidelines to ensure the protection of non-human primates from COVID-19, emphasizing isolation for staff and non-primate sites from the general public as the most effective approach. However, the challenges to conservation are context specific, and no single solution may apply across all sites. Managers and decisions makers at particular sites have to be alive to all the threats, and the feasibility of managing them. Covid19 threat is significant, but we believe that attempts to prevent its spread to non-human primates should not be blind to other threats to their conservation. Establishing a middle ground is pertinent. Compromises to prevent other immediate risks remains the most viable option to collectively conserve non-human primates and the environment they live in. Managers and decision makers in different sites need the flexibility to address the different risks for better outcomes post COVID-19.

## A field laboratory in the wild

*Akankwasa Walter and Aliyo Jacob*

**B**udongo Conservation Field Station runs a field laboratory that has and continues to play a vital role in monitoring the health of wildlife, livestock and on isolated occasions the people in the Budongo landscape. Established in 2011, with an aim of aiding chimpanzee health monitoring, it has gone on to be vital in our more recent approach of one health in disease surveillance. One health is a collaborative, multi-sectoral and trans-disciplinary approach with a goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants and their shared environment.

When chimpanzees are habituated for research and/or tourism, the practice increases their tolerance to human presence and in essence interaction, which exposes both the primates and people to zoonotic infections. The health risk is higher for chimpanzees because of their physiogenetic relatedness to humans and being naïve to most human pathogens makes them more vulnerable to fatal consequences. We therefore take the responsibility upon ourselves to regularly collect samples from the wildlife for periodic assessment of their health. The ultimate goal is not to treat the sick but to detect pathogen threats early and create a barrier. For example, if we detect a high parasitic load among the chimpanzees, we deworm people in close contact with the chimpanzees and also forest edge livestock to mitigate further exposure to the hazard.

When we talk of a laboratory, well, it's not a level four laboratory but a basic laboratory. Walking through this lab one will notice two wings (the right wing and the left wing). The right wing houses a bench room where all the samples are processed and analysed, a postmortem room where we carry out necropsies in case in-situ necropsy is not possible, a cold room where the refrigeration systems are stored and a changing room where we change into our field and laboratory

gears. Within the cold room is also the drug cabin. On the left wing are; offices, a storage room, a museum and resource center.

Samples from chimpanzees and other wildlife are often collected non-invasively through opportunistic sampling to avoid the risk of exposure to anesthetics but also to minimize frequent contact with an endangered species. However, occasionally samples can be picked invasively especially during snare removal veterinary interventions (e.g. blood and swabs) or during necropsy (e.g. blood, swabs and tissues). While most laboratory analytical tests are carried out in the laboratory after field work, others are done in-situ. For example, while fecal processing and analysis is done in the laboratory as it requires sophisticated equipment to process the samples, urine samples are often analysed in the field. Samples may also be are picked and analysed from wildlife, livestock and as well as humans if need arises. The main analyses done at the moment though we have hope to explore into other analyses in the near future are; parasitology, protozoology and urinalysis for primate samples. Occasionally, human and livestock samples are analysed as well.

Parasitology and protozoology require analyzing opportunistically collected fecal samples for gastrointestinal parasites and protozoa respectively. Gastrointestinal parasites though not acutely fatal, they affect the chimpanzees life span making them susceptible to fatal infections. For the last ten years, soil transmitted helminths i.e. oesophagostomum, strongyloides, ascaris and hook worms have been the most prevalent of the isolated gastrointestinal parasites. Some chimpanzees however have been found to host cestodes; a parasite we believe is acquired from the monkeys as intermediate hosts. Interestingly, globocephalus, a swine helminth has also been commonly identified which is indicative of cross species helminthes transmission. Urinalysis(urine analysis) tests involves the examination of urine for certain physical properties, solutes, cells, cysts, crystals, organisms or particulate matter and mainly serves for medical diagnosis. We usually combine the visual and the Eliza rapid test



strips in which colour changes on the strip when compared to the standard colour chart are indicative of either normal or abnormal physiological state. The main urine parameters we have been focusing on have been; blood, ketones, glucose, bilirubin, leucocytes, nitrites and PH. For example, from our observations in the last five years, there has been a correlation between food scarcity and high ketone bodies presence in urine among the Sonso and Waibira chimpanzees. Presence of ketones in urine is associated with starvation or going long periods without food which has been further evidenced by the fact that ketones are often present in chimpanzee urine samples during periods of food scarcity. In some cases, blood detected in urine may be due to hematuria which may be caused by trauma, urinary tract infections, bladder stones and blood clotting problems however if it's a female that gave birth recently or cycling female we usually worry less.

Occasionally we have tested cycling females for pregnancy using the Human Chorionic Gonadotropin (HCG). We started testing for pregnancy to understand some hypotheses we had drawn during the routine health monitoring. For example, we had noticed some females eating more soil and resting more while other chimpanzees were feeding. To ensure its not sickness, we decided to test for pregnancy. Interestingly, some individuals that tested positive also tested negative after a few months and

after a few months, they delivered. This unexplained phenomenon interested us to continue testing for pregnancy to get trends and possible explanations to our ironic observations.

The laboratory has offered training opportunities for many university students both from Ugandan institutions and International institutions. Since 2011, the laboratory has hosted 12 Ugandan students doing their undergraduate special projects, two international students doing their Masters and one Ugandan doing Masters' research. Although the laboratory has basic equipment, it has been vital in sample processing and preservation for many researchers prior to transportation of their samples to respective laboratories for analysis. The refrigeration system has not only been beneficial to researchers but also to the forest edge communities. Notable is that most vaccines used in pets and poultry require a cold chain if they are to be viable for use. Thus BCFS laboratory has been keeping the vaccines required to vaccinate the pets (rabies vaccine) and poultry (New Castle Vaccine) to maintain their viability prior to use.

This laboratory has potential to expand and serve the intended role to detect pathogens early and eliminate or control the source before it causes more fatalities. We believe that this laboratory will evolve to be a hub for disease research using the integrated one health approach.



## Wild chimpanzee tool use

Noemie Lamon, University of Neuchatel

During my research for my Master's degree I examined tool use in wild chimpanzees with a particular focus on the ontogeny of object manipulation, as well as transmission mechanisms and possibility of cultural evolution of tool use in this species. Chimpanzees are known for their tool use proficiency and have been extensively studied regarding these skills. Previous studies on the ontogeny of tool use have focused on the development of one specific behaviour or on general object play in immatures without any link to tool use in adulthood. Furthermore, most studies on social transmission used experimental approaches with captive animals, mainly by seeding an artificial behaviour and studying its spread.

Few studies were able to document the emergence and the spread of a naturally occurring innovation in the wild and even fewer looked at the establishment of the behaviour and not just the initial propagation. Finally, non-human cumulative culture is still a hot

topic and few cases in the wild have been documented. To provide further insights into these topics, I conducted research on the wild chimpanzees of the Sonso community, in the Budongo forest, Uganda. In three studies, I first investigated the development of tool use by looking at object play in immatures, the proposed precursor of tool use, but also at adult object manipulations. I tested individual and social factors that could influence the type of object individuals played with. Second, I investigated the mechanism of persistence of a tool-related drinking behaviour, moss-sponging, which naturally emerged in the Sonso community three years prior to my research. Third, I evaluated whether moss-sponging constituted a case of cultural evolution and tested whether this drinking variant meets the criteria for cumulative culture. I found that, object manipulations generally decreased with age, while goal-directedness of object manipulations, by opposition to play, increased. I also found that adults manipulated preferentially leaves and woody vegetation, but never sticks, whereas non-adults had a preference for leaves, woody vegetation and sticks, with stick manipulation gradually decreasing to complete disengagement around the

age of 10 years. Leaving stick manipulation aside, non-adults played and explored in higher proportions the materials manipulated most often by their mothers, providing good evidence for social learning from mothers. When investigating moss-sponging, I found that, over a period of three years, the behaviour spread from a small number of founder individuals (eight) to 17 additional group members. This spread was not random or influenced by spatiotemporal associations, but instead followed a matrilineal pattern, meaning that chimpanzees possessing a moss-sponging individual in their matriline were more likely to be themselves moss-spongers compared to individuals from matrilines that did not have a moss-sponger. The acquisition of this sponging technique, as well as

the acquisition of the traditional leaf-sponging, often implies a initial phase, where the young individuals use the sponges discarded by the other group members. Finally, I found that moss-sponging fulfils most of the criteria for cumulative culture suggesting that it might have evolved from leaf-sponging and constitutes a basic case of cultural material evolution.

Overall, my research shows the importance of mothers and kin, with an influence already acting at an early stage of the tool use development. Furthermore, it shows that chimpanzees can display basic elements of cultural evolution, yet probably lacking high fidelity transmission mechanisms allowing them to reach a level of technological complexity found in humans.

## FICUS VARIFOLIA

Chandia Bosco, BCFS Senior Field Assistant

The chimpanzees of the Sonso community in Budongo Forest Reserve prefer to feed on some tree species more than others. *Ficus varifolia* is one of the top five preferred fig tree species by the chimpanzees in this community. It belongs to the moracea family and is estimated to grow to a height of 25 to 30m tall. It is a relatively big fig with a wide crown and a DBH of 100-120cm at maturity. When mature, this fig fruits twice a year; March to June and October to December for the second season. While in the field, *Ficus varifolia* can be identified using its unique features such as; a yellowish fluid that is produced when a slight cut is made on its trunk, the whitish fluid that is produced when its leaves or twigs are broken and a green phellogen is seen when sliced with a knife.

As a delicacy for many chimpanzees in the Sonso community, this fig is also a source of food to the chimpanzees through a number of seasons. The chimpanzees feed on the buds as well as the young leaves, the fruits (young, ripe and unripe fruits) and occasionally on the buttress roots of the same. However, the chimpanzees of Sonso have been observed to feed longer on the unripe fruits of *Ficus varifolia* than any other part. However the Sonso chimpanzees have been observed to feed more on the *Ficus varifolia* fruits during the first fruiting season than in the second. This could be attributed to the higher availability of food during second season as other figs such as *Ficus sur* are in fruit at about the same time. Watching the chimpanzees feed on *Ficus varifolia* is very exciting as they too seem very excited. Chimpanzees feed while communicating to one another using unique calls and gestures. These would often include food grunts to invite other chimpanzees to enjoy the delicious forage, pant grunts to show respect to their superiors (higher ranking members of their communities) and screams from subordinates as they get displaced by their superiors.

During our usual routine as we monitor the chimpanzees on a daily basis, taking note of their behaviours and feeding habits, monitoring on a day they are feeding on *Ficus varifolia* buds is quite easy as visibility is high. The fig shades its leaves and its crown is widespread more like an umbrella, with individuals usually spread all over.

# Nesting in chimpanzees

*Mugisha Steven and Chandia Bosco, BCFS Field Assistants*

Nesting is a term used to refer to a chimpanzee behavior of resting in a nest. Chimpanzees construct nests using plant materials. Nests can be for either day rest or a night rest. Before nesting the individual chimpanzee will communicate either with vocals, using resting call vocalization such as resting hoo; or use a signal such as a hand signal; and at times a combination of both a signal and vocalization. The nesting signal involves an individual scratching themselves while facing the intended resting target, followed by head and eye movement towards the preferred nesting place, usually a tree branch. Alternatively, especially for the case of mother chimpanzees, the individual will scratch looking at the target receipt, in this case their infant in the chimpanzee party and then move toward the preferred nesting place. The communication is made before constructing the nest. Chimpanzees start making their night nests from about 6:50pm to 7:20pm although this can be influenced by many factors such as; weather conditions, moonlight, feeding tree preference and chimpanzee personalities. Generally, on average, males delay to nest as compared to females. A rare case of nests is the ground nest. Ground nests are usually made by individuals who are sick, and it is a sign that an individual that build nests is too weak to climb up on the tree. Individuals on the ground risk being attacked by other wild animals that move on the ground, especially in the night.

During construction of a nest, an individual will bend or break several branches and bundle them together. At times, extra leaves are added for comfort depending on the intended use (day or night nest). Day nests are simpler as compared to night nests. The night nest is required for the night, and may need to be made more comfortable. The day nest is dependent on individual interests, and individual can even nest on the ground. The materials used to construct the

nests depend on their ability to hold the individual as he sleeps in the nest and the thickness depends on the purpose of the nest. Night nests are often thicker than day nests and the nest size is dependent on the size of the chimpanzee that will be using the nest. The height of the nest from the ground varies depending on height of tree but chimpanzees often prefer moderate height though a nest can be as low as 5m to as high as 30m above the ground.

Usually, every individual sleeps in their own nest apart from the infants who share with their mothers or adopted care taker in case they are orphaned at a young age. The distance from one chimpanzee nest to another depends on several factors including age, sex, relationship and rank. Adult chimpanzees build their nests about 10m apart if they are on the same tree though this highly depends on the relationship between the individuals. Mothers depend on allies as this may increase on alertness from any potential security threat. Often during day time, infants are seen engaging in social play in nests with their mothers watching from a distance.

Chimpanzees can start making their own nests from the age of 3-4 years and this may as well depend on whether the mother has a new infant. However, personality differences exist even among chimpanzees as some would prefer to stay within their mothers' nests for much longer if given a chance. Nalala a male juvenile (born July 2013) in Waibira stopped nesting with the mother (Nora) once she had an infant in October 2019. However, in November after the Norah lost her infant in a suspected infanticide, Nalala was seen sharing a nest with her mother again. Nests can be reused by anyone though there is possibility of displacement by a higher-ranking male against a lower-ranking individual. Chimpanzees can reuse a nest they used the previous night or even those they constructed earlier.



### **Tree preferences**

Day nests are temporary so almost any trees can be used to construct a day nest, as the location of the day nest many times depend on its proximity to a feeding tree. Since chimpanzees do not spend that much time in the day nests, the materials they use are do not have to be as strong as those used for night nests. Night nests on the other hand are constructed on big trees with strong branches and with several leaves. The size of the tree canopy is critical when choosing the ideal tree for a night nest. The leaves are also highly useful for keeping the animal warm and comfortable during the long cold nights.

However, much as chimpanzees rely on nests for resting, as field assistants, we as well “use” the nests in our everyday life as we work with the chimpanzees in the forest.

For example, the nests can be used for censusing chimpanzees. Before habituation of Waibira community commenced, the decision to habituate this community was highly based on the number of nests we had seen during the survey as this would give an idea on the number of chimpanzees in this community. Also following days of having been unable to see chimpanzees especially in Waibira (chimpanzees in this community have a wide home range), nests can be used to locate the them. By looking at the nests, the age (time since to was constructed) as well as the number of nests cab be used to tell the party size of the chimpanzees that nested around the previous night, or other nights. This is important because chimpanzee make night nests around a feeding tree making it easier for field teams to locate the preferred feeding tree at that particular time hence locating the “lost chimpanzees”.

## Budongo and its people

*Geoffrey Muhanguzi (Ag. Director, 2004-2007; Field Station Manager September, 2010- March, 2020). Mr. Muhanguzi is very much appreciated for his dedicated service and contribution to BCFS. He for many years remarkably played a key role in building BCFS' partnerships both locally and internationally. Up until March, 2020 when he retired from his formal service at the station, BCFS was and continues to be a household name among many communities neighboring Budongo Forest Reserve.*



### Who is Geoffrey Muhanguzi?

I am a trained forester with a passion for conservation of natural resources in a developing landscape. I was born, grew up and schooled in south-western Uganda in an environment rich with biological diversity. My first exposure to conservation was through folk tales and native training. I am an alumnus of Makerere University and with hands-on training from the Institute of Tropical Forest Conservation (Bwindi) where I served before joining Budongo Conservation Field Station (BCFS). As by end of March, 2020 I had served BCFS for 13 years and this is the longest portion of my professional service. It has been a pleasure to serve BCFS.

### First time in Budongo

I first came to Budongo Forest Reserve as an undergraduate student on field visit in 1992. Although it was a brief two days visit, we had a stop-over at the then Budongo Sawmills (the very site where BCFS is currently located). As a forestry student then I remember getting a good impression of being in a typical natural forest. I later came back to Budongo as an acting Director for BCFS (then Budongo Forest Project(BFP)) in 2004.

### Building a career with BCFS

I met Prof. V. Reynolds (who was in Uganda at the time) and Dr Gerard Eilu in Kampala and they gave me a quick briefing and linked me to Fred Babweteera. Dr Gerard Eilu had held the same position but was also leaving so he informed me that I had been identified to take up the responsibility. Both Gerard and Vernon asked me whether I would be willing to work in "that remote place" and I said YES. I came to BCFS then Budongo Forest Project (BFP) in 2004 driving in the same car with Prof. Fred Babweteera who was the Director then but on study leave. So I came in to act-as- Director. He introduced me to the place and the job. BCFS was then relatively small: we had 7 field assistants, 5 transect

cutters, 5 domestic staff and 3 international researchers (one of them an Assistant Director). This is less than half of what the staffing structure is like at the moment.

I worked for 3 years (2004-2007) and got a job with CARE International (in Uganda) to work in south-western Uganda around Bwindi Mgahinga conservation area. BFP was a stepping stone toward my getting the assignment with CARE International. I came back to Budongo as the Field Station Manager in 2010 after working with CARE for three years.

### Most fond memories of Budongo

My most fond memories start with the good moments with staff members and residents at Sonso. The times we would have meals together. I remember one time the resident team surprised me with a birthday dinner. Somehow they knew the date and it was within a busy week so I think they guessed I would forget about it; and they got it right (I forgot). They planned it so well that they were sure I would be back to camp by 7pm in time for dinner. The arrangement was kept secret until I was invited for supper and I found everyone seated in a pattern that suggested formality: then they started singing (Happy



birthday to you...). Honestly I felt some painful joy. Memories of social interaction with students and interns who came to camp. Our after – dinner discussions on various topics relevant for training and mentorship will remain memorable. I am delighted to see some of my former trainees holding responsible positions outside BCFS and in conservation. I feel value when they call and remind me of their time at camp and how useful it was.

One other memory is when I saved the life of a child that had been severely injured by a wild chimpanzee in the nearby Rwensamaforest. I got a call from our village agent that a wild chimpanzee had snatched a child as the mother was collecting firewood in the forest.

Local residents had gathered to find ways of recovering the child safely from the chimpanzee. Fortunately the 9-months old child was rescued but with deep severe wounds on the belly. The

NFA team in Nyabyeya got to the scene before me but we liaised and the injured child was taken to Kinyara Hospital. The child was then referred for specialized treatment in Masindi. On that day I drove the BCFS car at ‘ambulance raise dust speed’ which people had never seen me do. At Masindi Kitara Hospital we were referred to Hoima Referral Hospital and I still made it in time. My previous interactions with health workers helped a lot. We were also lucky there was a surgeon at the hospital at the time: the child was rushed into theatre, treated and recovered well. I was happy we handled a situation that would have undermined conservation work. Instead, conservation teams were perceived as caring for the people by sponsoring an ambulatory intervention among other help rendered.

**Best/worst thing that happened since you started working with BCFS**

There were a number of good things I may not pick the best. Often

good things may pass un-noticed because it is normal. The growth in staff enrollment, the expansion of infrastructure and growth in stature form part of the good things I celebrate about BCFS. BCFS is now known by government and other stakeholders. We are trusted, reliable and strategic partners to Uganda National Council of Science and Technology (UNCST), National Forestry Authority (NFA) and Uganda Wildlife Authority (UWA). Occasionally I am asked about conservation issues related to the entire Uganda’s Albertine rift area and someone specifically mentions that they know I have reliable information. I am happy to be associated to such an organization and the era. Hosting field school and citizen science sessions was exciting. Scientific achievements such as recent records on distribution of avian and amphibian species are a motivation for someone to remain with an active relationship with BCFS.

The worst time was when I would be told of a loss of life. It would be painful time when a member of staff passed on because as a small family out-there in the forest, staff shares a lot. Also when I was told that two big male chimpanzees: Zefa and Squibs had been found dead in the same week. The two were popular chimpanzees with nice stories and character around them.

## **Personal philosophy about natural resource conservation**

Conservation of natural resources is getting harder in this development era. When I first came to Budongo as a student in 1992 there was a lot of forest cover outside the forest reserve boundary in the valleys of Ewafala, Nyamajita and near the Karongo market. All that is now cultivated land and peoples' homesteads.

As the population continues to grow, the need for food, shelter and social services including growth of urban centres and infrastructure is evident. The discovery of oil and gas in the Bunyoro landscape has attracted even more people yet the natural resource base will not increase. There is more demand for natural resources than is available, yet there is little effort to provide alternatives. For example there is little effort towards tree planting by the private sector and locals in Bunyoro; instead local communities still rely on forest reserves for firewood, building and craft materials. It looks like government and people have not yet seen the urgency for individual ownership of trees, protection of natural habitats or development of alternatives. Both government and local communities should now prioritise cautious management of natural resources because we are outgrowing the available resources and soon we shall be short of what we need to address human needs.

## **For those thinking of joining BCFS as a donor, researcher, volunteer or staff**

Apart from the international challenges on economy and health: 'BCFS has potential'. The location inside a massive forest reserve protected by government offers numerous opportunities for growth. I always invite interested parties to come and explore for any available opportunities in research.

If I was a donor I would look into long term plans in order to develop and sustain the impact of the different activities. BCFS has provided a model for the relevance of research and conservation of natural resources.

## **The future hoped for**

Continued growth and relevance to society: As a centre for research, training and conservation activities we can offer a lot more if resources allow. When we piloted cultivation of less raided crops on sites adjacent to Budongo forest we were applauded by the local government and communities. There was tangible advice to the community. This approach has been used by other organisations elsewhere and that's a tick for BCFS. BCFS has potential to attract more thematic research that will strengthen the institutional vision.

## **Envisioned change over the next 5 years**

BCFS will grow. When we recover from Covid-19 or stabilize with it: we shall see more institutions seeking to partner with BCFS because of the trust and stature that we have developed over the years. More universities will seek for opportunities to work with us. Other specialized scientists will ask for space. BCFS will be expected to offer more practical advice and guidance to local stakeholders in management of natural resources.

## **A word of wisdom**

And now my brothers and sisters - one final thing: Fix your thoughts on what is true, honorable and right, pure and admirable. Think about things that are worthy of thanks (Philippians 4:8, Holy Bible). This is an emphasis of the BCFS core values.