Itombwe,
an unknown treasure

View of Lac-Lungwe

Geography

The Itombwe Mountain Massif is located in the South Kivu Province, northwest of Lake Tanganyika in the East of the Democratic Republic of Congo. The relief is part of the Mitumba chain and rises 600m above sea level to the west and reaches 3475m (Mount Muhi) to the north, with several peaks reaching beyond 2000m, and then falls abruptly to 770m to the east at the level of Lake Tanganyika. The Massif covers an area of approximately 16,000 km^2 within the administrative territories of Mwenga, Fizi, Uvira and Walungu.

The Itombwe Massif experiences a diversity of climates, including equatorial lowland to submontane climates in the west, a tropical thumid montane climate on the high plateaus, and a tropical humid climate on the eastern and southern margins. Precipitation varies from more than 3,000 mm/year on the western side to less than 1,600 mm/year on the high plateaus, and below 1,200 mm/year on the eastern and southern margins. Rainfall is well distributed in the west, with increasingly longer dry periods moving east.

The zone is characterized by a mosaic of mountain and sub mountain forests interspersed with savannah woodlands, with altitudes varying between 900m and 3,475m (Mount Mohi, to the north of the Massif), providing an uninterrupted forest gradient likely to withstand, if protected, large altitudinal shifting following climate change. From a nature conservation standpoint, the Itombwe Massif is the largest and most important montane forest area in the African Rift. In Sub-saharan Africa, this ecological gradation is extremely rare, having generally been obliterated by cultivation, fire and other anthropogenic factors.

The Itombwe Mountains lie at the intersection of three main Phytogeographical regions. In the west, the flora belongs to the Guineo-congolian regional center of endemism, which encompasses the extensive forest block extending from Nigeria to eastern DRC. The mountains in Itombwe contain submontane, montane, and bamboo forests, grasslands, and subalpine vegetation. Bamboo forests are intermixed with montane forests but that limits

between the two are often well marked, bamboo forests being more developed above the main precipitation limit (2,200- 2,400 m elevation). Bamboos are often mixed with Podocarpus spp. or other montane tree species. It appears that this species is a normal constituent of upper montane forests but its extension is favoured by forest clearings. The eastern side of the plateau is characterized by a steep escarpment that drops precipitously in elevation to the lacustrine plain of Lake Tanganyika, which continues to the western mountains of Burundi. Itombwe is one of the very few in sub-Saharan Africa with a complete and continuous succession of forest types from low-elevation rainforest to montane forest. Southern and eastern grasslands and wooded savannahs have affinities with the Zambezian regional center of endemism. The southern part includes a vast extent of grass-land almost completely devoid of trees. On the northern and eastern borders of the Itombwe Mountains, forests have almost totally disappeared due to high human presence.

History

The Itombwe Mountains remained for a long time very difficult to access and very isolated, and therefore very little administered even during the colonial period. Itombwe has attracted much attention from the conservation community since the early 20th Century. The Itombwe mountains were given a high conservation priority at a World Wide Fund for Nature (WWF) conference held in Libreville, Gabon in 2000. Because of its exceptional conservation value, the government of the DRC identified Itombwe as an important site to integrate in its network of protected areas. As a result, a ministerial decree was issued in October 2006 as a first step to establish part of the Itombwe forest as Natural Reserve (Réserve Naturelle d'Itombwe – RNI), to be managed by the Institut Congolais pour la Conservation de la Nature (ICCN), the official agency in charge of the nation's protected areas. However, the decree lacked many essential elements, such as the precise location and limits of the Reserve, its total area or the forms of land use assigned to different zones. This ambiguity has led to multiple, and at times conflicting interpretations by different stakeholders. Fortunately, a long participatory process was engaged in 2008 in order to adress these flaws and strengthen the legal protection of the protected area.

Biological Diversity

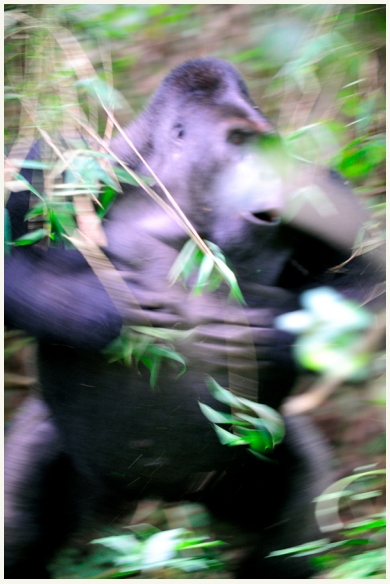
Biological surveys that were carried out in 1996 confirmed the exceptional biological value of the Itombwe Massif, which harbors 583 species of birds of which 30 are endemic to the Albertine Rift. Itombwe is the only known location for the Congo bay owl *(Phodilus prigoginei)*, Schouteden's swift *(Schoutedenarpus schoutedeni)* and Prigogine's nightjar *(Caprimulgus prigoginei)*. Itombwe harbors 35 species of reptiles *(5 endemic)* and 23 species of amphibians *(16 endemic)*. The mountain Massif is also home to 72 species of mammals of which 4 are endemic. The Itombwe Massif holds important populations of

Grauer's Gorillas *(Gorilla beringei graueri)*, eastern Chimpanzees *(Pan troglodytes schweinfurthii)* while African forest elephants *(Loxondonta africana cyclotis)* may still be present.

Grauer's gorilla *(Gorilla beringei graueri)* is endemic to the mixed tropical and montane forests of the western Albertine Rift escarpment and eastern lowlands of the DRC. It is classified as Critically Endangered on the IUCN Red List (IUCN 2016), listed on Appendix I of CITES, and has full legal protection under the DRC and international laws. Grauer's gorilla is one of two subspecies of eastern gorilla *(Gorilla beringei)*, the other being the mountain gorilla *(Gorilla beringei beringei)*. Grauer's gorilla was once called the eastern lowland gorilla, though this nomenclature is misleading as the subspecies occurs over the widest altitudinal range of any gorilla, from approximately 600 m to 2,900 m, overlapping con¬siderably with the altitudinal range of the mountain gorilla (1,400–3,800 m). Research using paleoenvironmental, geological, and biogeographical evidence suggests that a small group of eastern gorillas likely dispersed westward from the Virungas into present-day Grauer range. As the lowland forests of central Africa expanded rapidly during the early Holocene, they became connected with the expanding highland forests along the Albertine Rift and enabled the descendants of this

small group to widely disperse. This ultimately resulted in the Grauer gorilla subspecies recognized today [Tocheri et al].

The first systematic surveys of gorillas in Itombwe in 1959 located 17 discrete areas of occurrence. In 1996, the first major biological surveys in the Itombwe Massif in over 30 years revealed that significant areas of natural habitat and remnant faunal populations remain, but these are subject to ongoing degradation and over-exploitation. At least 10 areas of Grauer's gorilla occurrence, including eight of 17 areas identified during the first survey off the species in the Massif in 1959 komma were found. 79 gorilla nest sites were recorded and at least 900 weaned gorillas were estimated to occupy the Massif with an average density of 0.3 gorillas per sq. km. Historically, gorillas also ranged south of Itombwe in the bamboo forests of the western rift escarpment. Itombwe Reserve area was created particularly in order to protect Grauer's gorilla populations.



Grauer's gorillas do well in secondary and regenerating forests due to abundant terrestrial vegetation,.so are often found near active or abandoned agri¬cultural clearings, mines, villages and other sites of human disturbance. They also opportunistically raid fields to feed on crops such as bananas and sugar cane, but they prefer fruit in the forest when it's available.

The fruit food repertoire of Kahuzi gorillas resembles that of western and eastern lowland gorillas inhabiting lowland tropical forests, while their vegetative food repertoire resembles that of mountain gorillas inhabiting montane forests [Yamagiwa et al]. The occurrence of gorillas across a variety of vegetation types and human impact in Itombwe suggests a high degree of behavioral flexibility by Grauer's gorilla in adapting to sometimes unique local conditions.

In 2015 WWF conducted additional localized inventories in Itombwe finding clear evidence of the presence of gorillas inside the Itombwe Reserve, but an estimation of the total population numbers could not be made. Based on extrapolation of Grauer's gorillas in Kahuzi-Biega NP to comparable habitat in Itombwe, it has been estimated that Itombwe may still have a population of approximately 100 Grauer's gorillas. This makes Kahuzi-Biega NP, Itombwe and Maiko NP one of the most important strongholds for that threatened species, endemic to Eastern DRC.

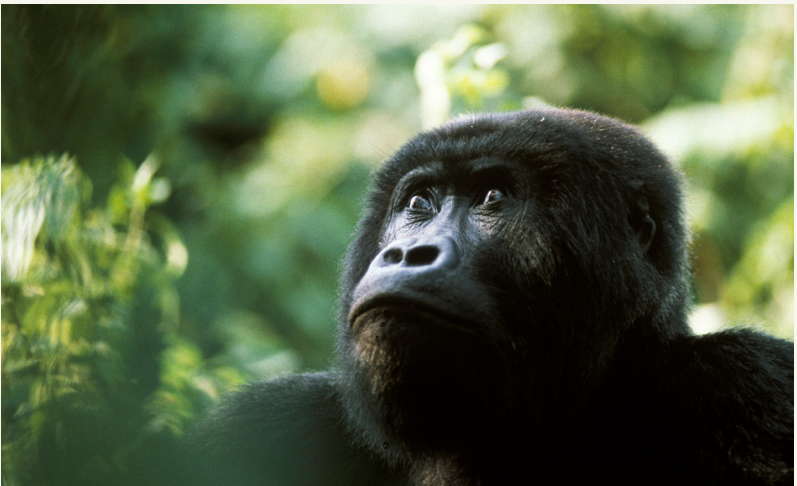
Chimpanzees *(Pan troglodytes schweinfurthii)*: The Itombwe Massif also harbours an estimated population of 6,302 chimpanzees (Plumptre et al, 2010). Chimpanzees are more versatile than gorillas in terms of the habitats they are able to occupy. They adapt to a wide range of habitat types, including forest-savanna mosaic, woodlands and humid tropical forests, and range from sea level to 2,790 m elevation. Chimpanzees are highly frugivorous, so they depend on forests having a high fruit production.

For the Itombwe Massif the population estimation is 1,241 (Plumptre et al, 2010).

The PARAP inventories inside Itombwe for all the Reserve, the estimated chimps' individuals are 85. Itombwe Massif, in fragmented populations in tiny islands of forest.

The African elephant *(Loxodonta africana cyclotis)* may survive in some southernmost parts of its range in.

In a 1999 survey a dozen of elephant faeces were observed. A single elephant shot dead in Isopo forest (not far from Mwenga territory) in June 2014 provides recent evidence of forest elephant presence in the area. In the 2015 inventory, no sign of the presence of elephant was observed. However, the surveys gathered witnesses from local population that the elephant population migrates between the low altitude regions during dry season to high altitude region during the rainy season.



In their role of keystone species, elephants are critical for the long-term survival of healthy ecosystems that benefit people as well as wildlife and plant species. Conserving elephants delivers more than just elephant conservation, since the habitat protection, law enforcement and community engagement requirements of successful elephant conservation benefit many more species and places. As iconic, culturally important species, elephants also play an ambassador role for not only their conservation needs but also the needs of other species, since they present opportunities for communication, education, awareness and fundraising that help to conserve other species. In tropical forests, elephants create clearings and gaps in the canopy that allow tree regeneration and provide habitats for gap-specialized species. Still as a flagship species, elephants have cultural, economic and ecological importance. These provide opportunities to maximize elephant conservation, but also to protect other biodiversity and provide economic benefits to national governments and communities living alongside elephants. Culture is important for Africans and protecting elephants is regarded as protecting African culture.

Human Presence

The population density in the Itombwe Massif and surrounding areas is relatively lower compared to other areas of the Eastern DRC, varying between 100 inhabitants/km^2 in the northern part of the area to 10-20 inhabitants/km^2 in the high plateaus and western areas. Population is concentrated along major roads. The area has always witnessed migrations of people from neighbouring areas. This has resulted in a complex and very rich mix of socio-geographic groups.

The population is composed of six major ethnic groups, each of which occupies a specific geographic area. The Babembe live in the southern part, the Barega in the west, the Bafulero and Bavira in the east, the Banyindu and Bashi in the north while the Banyamulenge are found in the forest savannah mosaic in the high altitude central areas. The latter are mostly pastoralists while

the former are mostly agriculturalists. Across ethnic groups, land-use rights are regulated through traditional customary norms. On the whole, the population in and around the Itombwe Massif is poorer than the national average, with limited income-generating opportunities and extremely weak social infrastructures, particularly in the areas of health and education.

By and large, agriculture is the basic subsistence activity for all ethnic groups in both forest and savannah areas. In the forested areas of the Massif, shifting agriculture is the main economic activity. New fields continue to be opened in the forest, bringing about a reduction in forest cover with negative effects on wildlife. Additionally, local people and armed groups in forested areas practice hunting, which constitutes a major source of proteins. In contrast, in savannah areas cattle raising is a major activity.

The Itombwe Massif is also rich in minerals. Artisanal and small-scale mining is another major source of income in the Massif and has an influence on hunting, as a source of proteins for more diggers, and as an additional commercial activity.

Threats

Various studies by conservation NGOs identified several threats to the Natural Reserve of Itombwe:

- **Poaching.** People are hunting animals for bushmeat to feed to villages and towns around Itombwe. Snare hunting is aimed at smaller mammals, but gorillas can get seriously hurt or even die when they get stuck with a foot or arm in a snare. Increasing population pressure has made the bushmeat trade unsustainable in most parts of Africa and Itombwe is most likely no exception. Forest elephants have most likely already been exterminated in the Itombwe landscape by poachers.

- **Presence of armed groups.** The region has been unstable for many years and various armed groups are present in and around the Itombwe landscape. This results in lawlessness in the forest, use of military grade guns and killing of animals including gorillas. Anti-poaching is difficult as rangers normally do not enter areas where armed groups are known to hide.

- **Shifting cultivation** driving habitat degradation and habitat destruction. The population living around Itombwe are mainly farmers. The traditional techniques they use for producing deplete quickly both forest and soil fertility.

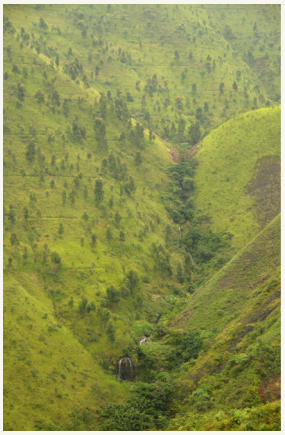
- **Abusive illegal logging** driven by the lack of law enforcement.

- **Subsistence hunting.** Coupled with slash and burn cultivation, subsistence hunting jeopardizes the wildlife. Effectually this threat is appearing because of other contributing factors such as weak law enforcement, remoteness of the area. The farmers are then continuing subsistence hunting as they feel that there is free access to these resources full stop.

- **Small-scale and large-scale** mining concessions in and outside of the Itombwe Protected Area driven by national and international markets. The main minerals that are exploited are cassiterite, gold and coltan.

- **Carbonization: artisanal charcoal production** mainly to supply urban and centres which create a circle of degradation around major cities (Mwenge, Burhinid, Kaumatua, etc.). Dead wood is generally collected from natural formation and fallow land, and living trees are felled when new fields are cleared. Illegal logging thrives in an environment of armed gangs and corruption.

- **Grazing: Conversion of forest into pastures for cattle rearing** with cattle grazing and regular fires preventing further forest regeneration. This phenomenon is exacerbated by two processes. First, the migration of pastoral people into the region several decades ago has increased the need for grasslands, both to feed animals and for cultural purposes. Second, the willingness of more and more people to raise cattle, even those with a traditional forest way of life being influenced by the grassland people, and past cattle ranching activities



during colonial times. High population densities, as well as the presence of grassland people are key reasons for the high level of deforestation of the northern and eastern borders, as well as parts of the high plateaus where productivity of natural pastures is low (3-4 tons dry matter/ha/year) while stockbreeding practices remain essentially extensive. Under these circumstances, a forested landscape is being transformed into grassland, without maintenance of a certain forest-grassland balance. Therefore, sustainable pasture management techniques and fodder crops are high priorities.

- **Small scale mining:** Itombwe besides its value as a nature reserve is also well-known for its mineral deposits. Artisanal Small Scale Mining (ASM) has been on-going since 1920s. Coltan, cassiterite and, to a lesser extent, gold, can be found all over the reserve while mining in the southern part of the reserve mainly concentrates on gold exploitation.

Human activities continuously modify the landscape, usually in the form of forest degradation. Despite their present vast extent, the forests of the Itombwe Mountains are steadily diminishing under human pressure. The western slope is still mainly forested, but nevertheless exhibits important areas of degraded or clear-cut forest intermingled with secondary forests and

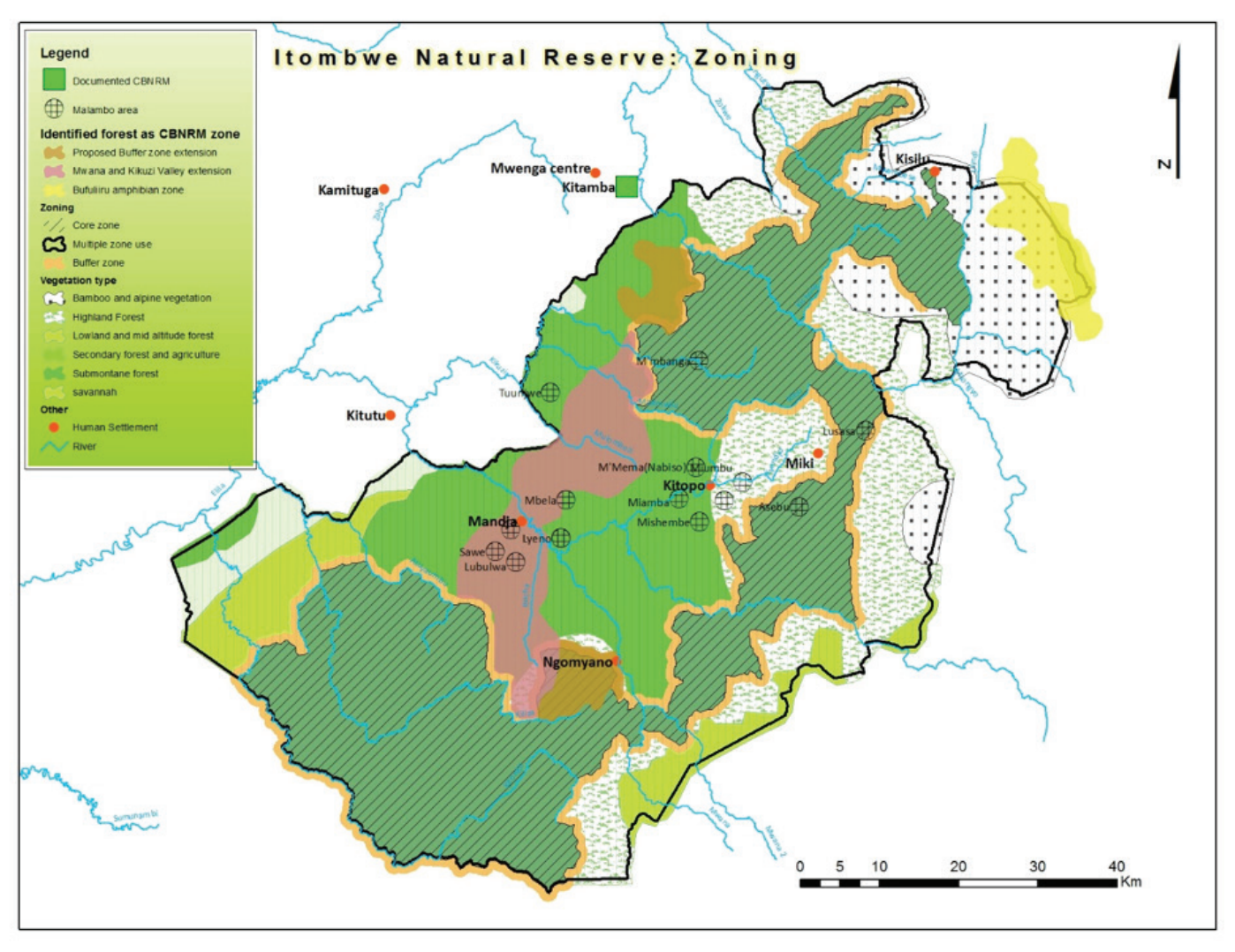
remnants of primary forests. Much smaller degraded areas are widespread around villages and along roads. Here, the causes of deforestation and forest degradation include small-scale and intensive large-scale mining activities, shifting agriculture, and artisanal timber-logging, charcoal production, firewood harvesting and hunting. The effects of fire on the dynamics of savannah either cause regression of the herbaceous stratum to a steppe formation, or they permit the maintenance of the savannah, but in any event the uncontrolled fires at the end of the dry season constitutes a threat to the forest areas of both savannahs and forests.
Climate change will most likely affect nature and people in and around Itombwe. Several phenomena are expected to have an impact. Erratic rainfall will affect agricultural production and possibly lead to loss of crops. This may push farmers to increase the area of farmland and increase shifting cultivation. Higher temperatures may increase the treeline and in time may increase the forest cover available for Grauer's gorillas. This process if it happens will take many years. Higher temperatures may also affect the prevalence of diseases, which may impact both people and wildlife. Droughts and floods will affect river flows and availability of water. In drier years cattle will most likely move into the core zone looking for fresh grass and water. A general drying of the forests in the Congo basin has already been observed, possibly leading to forest fires and in general change of forest composition. Most impacts of climate change are still poorly understood and difficult to predict. The forest ecosystem itself can in principle adapt to temperature changes by moving up or down the mountain gradient, where favourable ecological conditions prevail. Changes in rainfall patterns, including droughts, will most likely have serious impacts. But the most serious impacts are most likely due to increased pressure from humans that respond to climate change and have major impacts on the fragile ecosystem.

Outlook

Following the 2006 gazettement of the Itombwe Reserve, initiatives have been taken to formally deliniate the Reserve respecting the free, prior, informed consent methodology (FPIC). Since then a process of participatory rights and land use mapping has been implemented, including the local population, the members of the joint committee (ICCN, WWF, WCS, Africa Capacity) the representative of the Provincial Ministry of Environment, the representatives of administrative territories and traditional authorities involved in the geographical location of Itombwe, the Civil Society organisation and the community Based Associations. This has resulted in 2017 in a proposed land use planning map (see Map 1), approved by the communities in and around Itombwe and at provincial government level. Three conservation zones were defined within the Itombwe Reserve: a multiple use zone, a buffer zone and a core zone.

This important process of consultation clarifies and orients decision making by providing precise information from the field including: land use and ownership, the different pre-existing rights over a specific area of forest, the potential for high levels of biodiversity, etc.

The next challenge for Itombwe will be the effective protection of the core zone and sustainable use of the multiple use zone. Protection will need a significant investment in conservation staff, infrastructure and materials. In nearby Kahuzi-Biega NP, a survey in 2015 estimated a minimum of 213 gorillas to be present in the high-altitude sector of KBNP. This represented an 18% increase since 2010 and a 64% increase since the drop observed between 1996 and 2000 [Spira et al, 2015]. This is rare but tangible proof that it is possible to protect a park and let Grauer's gorilla numbers rebound. The bigger challenge may be the multiple use zone and co-management agreements with the communities. Providing a growing population with food and materials from a finite resource without jeopardising the ecological integrity of this zone will demand determination, new skills and techniques and serious financial investments.



MAP 1: Reserve delineation based on participation approach

Further reading

Eastern chimpanzee status survey and conservation action plan 2010-2020, IUCN, 2010.

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