21. Maiko-Tayna-Kahuzi-Biega Landscape

Figure 21.1. Map of Maiko-Tayna-Kahuzi-Biega Landscape (CARPE, DFGFI, JRC, SRTM, WWF-EARPO).

Location and area

This Landscape is situated in the eastern part of the Democratic Republic of Congo (Figure 21.1). It covers an area of 67,121 km² and includes the Kahuzi-Biega and Maiko national parks as well as the Tayna Gorilla Reserve. Altogether, protected areas make up 27.4% of the Landscape.

The Landscape in brief

Coordinates: 0°20'30"N – 2°45'17"S; 26°35'8"E – 29°2'51"E
Area: 67,121 km²
Elevation: 495–3,279 m (average: 1,010 m)
Terrestrial ecoregions: Northeastern Congolese forests
Afromontane forests of the Albertine Rift
Aquatic ecoregions: Albertine Rift mountains
Upper Congo
Protected areas: Maiko National Park, 1,000,000 ha, 1970
Kahuzi-Biega National Park, 660,000 ha, 1970-1974
Tayna Gorilla Reserve, 88,600 ha, 2002

Physical environment

Relief and altitude

It is mountainous in the east, and the eastern part of Kahuzi-Biega National Park extends across the mountain chain forming the western rim of the Albertine Rift. Towards the west and in the direction of the Congo River, the land is lower, creating a significant altitudinal gradient (495-3,279 m). The western part of both national parks is relatively flat.

Geology and soils

The entire Landscape has a substrate of metamorphosed proterozoic rock belonging to the Kibarian system. There are two extinct volcanoes in the upper part of Kahuzi-Biega National Park dating from the end of the Tertiary or Quaternary era: Kahuzi and Biega.

Hydrology

The hydrographical system belongs entirely to the Congo Basin. All rivers originate in the mountains to the east and discharge into the Lualaba, which becomes the Congo River downstream of Kisangani.

Climate

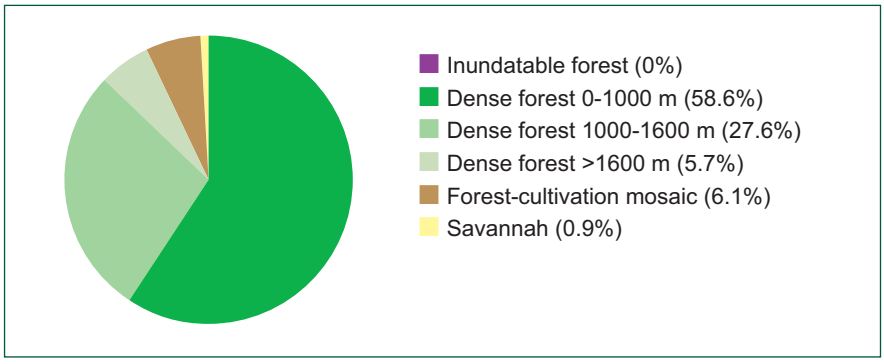
Annual rainfall averages between 1,800 and 2,300 mm. The driest season is July to August and the rainiest seasons are in October-November and March-April. The mean annual temperature varies depending on altitude.

Vegetation

Most of the Landscape is covered by dense terra firma forests (Figure 21.2), with varying composition and structure depending on altitude (Pierlot, 1966). The plain (lowland) forests extend up to an altitude of 1,000 m, with mixed vegetation of *Strombosia* and *Parinari* and a monodominance of *Gilbertiodendron dewevrei* or *Michelsonia microphylla.* Between 1,000 and 1,600 m are the submontane or transition forests, characterized by the presence in particular of the genera *Pentadesma*, *Lebrunia, Cynometra, Julbernardia, Pouteri* and *Staudtia* or by the local dominance of *Ocotea michelsonii* (Pierlot, 1966; Doumenge, 1998). Above 1,600 m are afromontane forests characterized by the genera *Diospyros*, *Entandrophragma*, *Ficalhoa*, *Olea*, *Parinari*, *Podocarpus*, *Prunus* and *Syzygium*. As of 2,300 m, but especially above 2,800 m, these forests are intermixed with thickets of bamboo *Synarundinaria alpina*. The afro-subalpine vegetation comprises high-altitude mountain forests of *Olea*, *Podocarpus* or *Hagenia abyssinica*, thickets of Ericaceae and mountain grasslands. At the summit of Kahuzi there is a small area of tree groundsel *Senecio sp.* and giant lobelias *Lobelia sp.* Below 1,300 m there are large stretches of swamp and riparian vegetation.

The flora is abundant, including many endemic species. It represents a transitional area between the Guinea-Congolese biogeographical region in the west and the Kivu-Ruwenzori region of the Albertine Rift in the east, which forms part of the biographical region of afromontane forest (Pierlot, 1966). A recent global analysis conducted by Conservation International (CI) has identified it as a unique region as it combines Congolese forest, a wilderness area of considerable biodiversity (Colyn *et al.*, 1988), and the Albertine Rift, a hotspot of worldwide importance: the eastern afromontane archipelago (Mittermeier *et al.*, 2003; Mittermeier *et al.*, 2004). Paleoecological studies also show that this region contained refuges of montane forest during the cold and dry periods of the Pleistocene era (Myers *et al.*, 2000; Kingdon, 1980; Hamilton, 1988; Pomeroy, 1993).

Figure 21.2. Main vegetation types (Source: JRC).



Fauna

Mammals

In tandem with its diverse habitats, the Landscape is also home to a rich variety of mammals, in particular the elephant *Loxodonta africana*, the chimpanzee *Pan troglodytes*, the eastern gorilla *Gorilla beringei* (including almost the entire population of the *graueri* form), numerous other primates, amongst which Hamlyn's monkey *Cercopithecus hamlyni*, L'Hoest's monkey *C. lhoesti*, Dent's mona monkey *C. denti*, the blue

monkey *C. mitis* (with notably an endemic hybrid form *kandti x stuhlmanni*), Schmidt's guenon form of the red-tailed monkey *C. ascanius*, the olive or anubis baboon *Papio anubis*, the grey-cheeked mangabey *Lophocebus albigena*, the *ruwenzori* form of the Angola colobus *Colobus angolensis,* the *ellioti* form of the red colobus *Piliocolobus oustaleti*, Thollon's red colobus *C. tholloni*, a hybrid form of these two colobus monkeys, the dusky bushbaby *Galago matschiei*, Prince Demidoff's bushbaby *Galagoides demidoff*, Bosman's potto *Perodicticus potto*, the giant forest hog *Hylochoerus meinertzhageni*, the okapi *Okapia johnstoni,* the bongo *Tragelaphus euryceros* and the panther *Panthera pardus*.

Birds

The bird fauna is rich, including most of the endemic montane or submontane species of the Albertine Rift, notably the handsome francolin *Francolinus nobilis*, Grauer's broadbill *Pseudocalytomena graueri*, the yellow-crested helmetshrike *Prionops alberti*, Grauer's cuckooshrike *Coracina graueri*, Chapin's mountain babbler *Kupeornis chapini*, the Kivu ground thrush *Zoothera tanganjicae*, Archer's robin-chat *Cossypha archeri*, the yellow-eyed black flycatcher *melaenornis ardesiaca*, the Ruwenzori batis *Batis diops*, Rockefeller's sunbird *Nectarinia rockefelleri*, the regal sunbird *N. regia* and Shelley's crimson-wing *Cryptospiza shelleyi* (Fishpool & Evans, 2001). The Congo peafowl *Afropavo congensis* is found in the low-altitude forests (Hart & Upoki, 1995).

Humans in the Landscape

Density and distribution

Reliable demographic data is very thin for this Landscape, particularly since the significant displacement of populations during recent conflicts. Generally speaking the population is unevenly distributed, with a rising density gradient moving from west to east: on the mountains of the Albertine Rift, the density is over 300 inhabitants/km^2; the western lowland regions are relatively sparsely populated and 80% of the Landscape is covered by forests without any permanent villages. The remaining 20% probably has an average density of under 30 inhabitants/km^2. The total population is estimated to be less than 400,000 inhabitants. Surveys by DFGFI suggest that more than 30% of this population is under 20 years of age.

Ethnic groups

The Landscape encompasses a mosaic of Bantu people characterized by their languages, notably Nande, Pere, Hunde, Nyanga, Rega, Kwame, Kumu and Shi. There are also small populations of Twa Pygmies, the majority of whom live near Kahuzi-Biega National Park in the south. Swahili is the most common language.

Activities

The principal economic activities in the Landscape are subsistence farming, hunting, extensive cattle farming, goat and/or sheep farming and small-scale mining. Most of the farming is carried out using slash and burn methods, but close to ancient villages there are oil palm, banana, coffee and cinchona tree plantations. At high altitude, around the upper regions of Kahuzi-Biega National Park, the Shi people carry out permanent agriculture.

Subsistence hunting takes place throughout the Landscape and active commercial hunting exists around the mining camps. The trade in bushmeat is not, or no longer,[1] as developed as in western Central Africa, but consumption of bushmeat is high in the smaller centers, such as Lubutu. Hunting for ivory also exists throughout the Landscape and is carried out by illegal armed groups.

There are no official mining concessions, but mining for gold, tin (tin-stone), coltan and diamonds is intensive in several areas of the Landscape (Tegera, 2002). In some places, notably Walikale, these operations are so successful that the inhabitants have abandoned farming. Consequently, large quantities of food are brought in by plane at very high prices, completely destabilizing the local economy.

There are few usable roads, but one asphalt surfaced road runs from Lubutu to Walikale in the center of the Landscape. At present, it is not accessible to vehicles except via a poor quality dirt road from Kisangani in the northeast. This road makes it possible for small planes used by the mining business to land.

Land use

Outside of protected areas the majority of land cannot be assigned to one particular use (Figure 21.3).

[1]During the 1980s bushmeat was traded intensively with the towns of Goma, Bukavu and Kisangani. This trade has probably suffered from the poor state of the road network and perhaps also from the sharp fall-off in game.

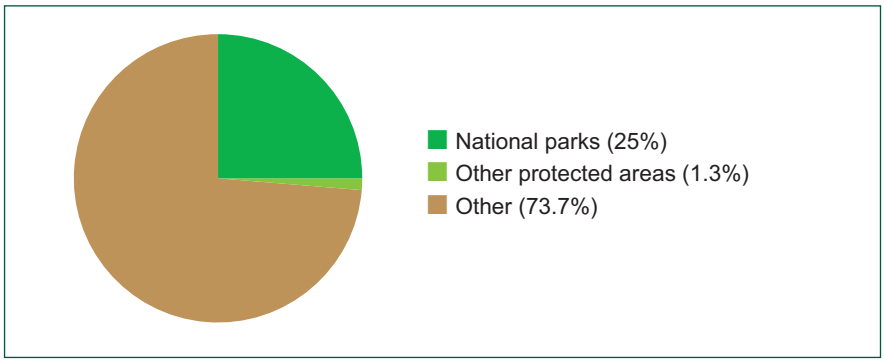


Figure 21.3. Land use types.

Logging

There are no official forestry concessions in the Landscape, but small-scale logging operations have long existed around certain villages. On the eastern fringes of the Landscape, charcoal production is also an important trade, supplying urban centers in the region.

Reasons for the identification of the Landscape

(1) The region includes two national parks that were already established in 1970.
(2) The region was recognized as having regional importance during the WWF workshop in Libreville in 2000 and designated a Landscape under the CARPE program.
(3) In a global context, the region in this Landscape is characterized by a high degree of irreplaceability and an average degree of vulnerability; the conservation programs therefore have high priority.
(4) The region is considered to be an Important Bird Area (IBA) by BirdLife International (Fishpool & Evans, 2001).
(5) The region harbored one or more forest refuges during the cold and dry periods of the Pleistocene era.
(6) The Landscape is a testing ground for innovative approaches to conservation, comprising a mosaic of national parks and community reserves managed in a traditional manner with the aim of matching conservation objectives to the needs and aspirations of local people.

Conservation

History

Maiko National Park (1,000,000 ha) was created in November 1970, replacing a former hunting reserve established in 1938. However, given the lack of human and financial resources, the difficulties of getting around the park, the presence of large human populations within the bounds of the park, their hostility to conservation and the large distance between monitoring facilities and the park boundaries (often several days' walk), it has never been possible to supervise the park effectively[2].

Kahuzi-Biega National Park was created in November 1970 with an initial area of 60,000 ha of high-altitude land. In 1975, the park was extended by the addition of 600,000 ha of transition and lowland forest to the west[3]. Since the end of the mid-1980s, the park has benefited from a GTZ support program. During its first phase, this program focused on the operation of the park, tourism development and raising awareness among local people and authorities. During its second phase, starting in 1991, the program concentrated on the park periphery and involving local people in its management.

These two national parks, managed by ICCN, suffered enormously from the war between 1996 and 2003. Apart from the high-altitude part of Kahuzi-Biega National Park, which continued to benefit from GTZ support during the conflicts, the parks were practically abandoned.

The Tayna Gorilla Reserve (88,600 ha) was recognized by the government in 2002 and supported by DFGFI via the US Congressional Gorilla Directive of USAID.

In October 2003, the CARPE program resumed support for conservation activities and management of natural resources in the Landscape. CI has been assigned responsibility for conservation in the Landscape. They work with numerous partners: WWF as concerns Kahuzi-Biega National Park and DFGFI for Maiko National Park and a series of projects for community reserves located between the two national parks. WCS also receives funding from CARPE for support to the two national parks.

[2] By the 1980s and early 1990s (well before the war) the park was partly occupied by gold panners and armed bands who tried to 'control' the former.
[3] The boundaries of this extension were determined by overflights and did not take account of the people inhabiting these forests.

Direct threats

(1) Crop and livestock farming

The expansion in these activities represents a direct threat to the forests and protected areas. Already the forest corridor linking the higher and lower parts of Kahuzi-Biega National Park has been completely opened up. At present, the greatest threat lies in the continuous immigration of people from the high-altitude to low-altitude regions. This phenomenon is not new and was already taking place in the 1970s and 1980s. At that time, Shi farmers had moved in and established permanent crop farming, which is ill-suited to lowland forests in the low-altitude regions accessible via the Bukavu-Walikale road.

(2) Hunting

Hunting for bushmeat and ivory are both important activities. Okapi skins are highly sought after. This hunting has always existed, but it increased significantely during the 1980s with the large-scale introduction of the Soviet-made *Baikal* gun. For the first time, hunters were able to kill monkeys in the treetops. In the space of a few years, populations of colobus monkeys were decimated over vast areas of the Landscape[4].

(3) Small-scale mining operations

Several areas of the Landscape are negatively affected by gold, coltan or tin-stone mining.

(4) Capture of live animals for export

Young gorillas[5] and chimpanzees continue to be captured alive; this activity is usually accompanied by the massacre of the adults. Many African grey parrots *Psittacus erithacus* are also captured.

Indirect threats

(1) Economic collapse

The local population currently has no other resources than those provided by the forest. Economic collapse was precipitated by the war, but its origins date back to the 1960s, when a rebellion took place. Subsequently, from the early 1970s, the process of 'zairianization' of foreign companies was followed by the virtual disappearance of tea, coffee, cinchona and oil palm plantations. The steady dilapidation of the road network and the disappearance of bridges has prevented the export of agricultural produce.

(2) Insecurity, political instability and corruption

Some of the destruction of the communication infrastructure was supported by populations in the 1970s and 1980s, in order to hamper movements by the army, which tended to seize anything it could. Now that the conflict is over, the situation has not really improved and uncontrolled armed bands are still occupying some parts of the Landscape, including the protected areas.

(3) Weak institutional capacity of ICCN

ICCN is currently unable to carry out its mandate owing to a lack of finance, equipment and manpower.

State of the vegetation

With 81% of its area covered by primary forest, the Landscape represents one of the largest expanses of intact forest in Central Africa.

State of the fauna

Despite the good state of the forests, the fauna is at serious risk.

The elephant population has shrunk dramatically since the mid-1980s and during the last decade this decline has gathered speed. Currently, the species has virtually vanished from many regions, in particular the high-altitude section of Kahuzi-Biega National Park and the southern part of Maiko National Park (Hart & Sikubwabo, 1996; Hart & Liengola, 2002). It is feared that only small isolated populations still survive.

The eastern gorilla populations are facing different threats. Their current population size is unknown, but is thought to be between 5,000 and 25,000 individuals (Hall *et al.,* 1998; Nixon *et al.*, 2005). Although most of the biologists working in the Landscape believe that the true figure is closer to 5,000, recent surveys are thought to have revealed significant previously undiscovered populations[6]. In areas where the gorillas are still protected, as in the high-altitude section of Kahuzi-Biega National Park where GTZ directly supports ICCN, the populations are still below their pre-war levels, but are rising (Yamagiwe *et al.,* 1993; Hall *et al.,* 1998; Mehlman, *in press*). The *schweinfurthi* form of the eastern chimpanzee lives in the same regions as the gorilla, while occupying a wider area, and its population density is thought to be half that of the gorilla. All other primates are under heavy pressure from hunting

[4] Until the end of the 1970s, five or six species of monkeys could easily be seen during a single day in the forests bordering the Bukavu-Walikale road, particularly in the Irangi region.

[5] Although eastern gorillas are from time to time killed for their meat or to protect crops, the groups are now regularly attacked by armed bands that kill the adults and capture the live young to sell to traffickers.

[6] This is based on research carried out in Maiko National Park by ICCN as well as research carried out by the staff of the Tayna Gorilla Reserve (Sivalingana-Matsitsi *et al.*, 2004).

in certain areas, particularly the two types of red colobus monkeys, Hamlyn's monkey and the other guenon monkeys.

A survey of the southern part of Maiko National Park in 2004 revealed frequent traces of large mammals (African river hog, buffalo, okapi and several species of duiker) on every transect. Recovery still seems possible provided that anti-poaching measures are stepped up and people are educated and provided with alternative sources of protein. The bongo may possibly still exist, but according to local inhabitants this species disappeared at least 20 years ago. The leopard still appears to be present and some village inhabitants have reported seeing the Ruwenzori form.

Financing and conservation

The success of the CARPE initiatives, an indication of the success of the overall CBFP, has drawn the attention of international financing agencies, such as the World Bank, UNDP and the European Union. These agencies have promised support at different levels. The private sector also wants to be involved: Pfizer Inc, in partnership with the DFGFI, has promised to give more than one million US dollars in medicines to meet the critical needs of the populations concerned and help provide health care for the personnel of community conservation and ICCN. CI has also promised to provide support via its Global Conservation Fund for sustainable conservation activities in the Landscape. With additional funding from DFGFI, established through the CARPE partnership approach, the first trust fund could come on-stream in 2007-2008.

Management and governance in the field of renewable natural resources

(1) At the Landscape level

No overall zoning exists for the Landscape as a whole, but a zoning procedure for the entire Landscape has been set in motion. This process has been strengthened by contributions from local communities involved in conservation and the sustainable use of their resources.

(2) In the national parks

The principal activities are focused on rehabilitating the national parks, through the CARPE program and GTZ, and enhancing skills of the personnel. Land use plans for the national parks are currently on the drawing board. ICCN patrols now cover over 30% of the two national parks, compared with just 10% prior to 2003, and then only in Kahuzi-Biega National Park. This figure is set to rise. The community reserves have added 230,000 ha to the network of protected areas. Anti-poaching measures and scientific activities are being organized in the parks by interested local parties. Other community reserves will be created. A partnership has been forged with ICCN and the new network of protected areas will be absorbed into the overall ICCN network. For Kahuzi-Biega National Park, other avenues of participatory conservation are being explored.

(3) In extraction areas

No particular activities to report.

(4) In rural areas

With support from the DFGFI, the program focuses on creating community reserves located strategically inside a corridor linking the two national parks and on enhancing the skills of personnel employed in these reserves. In order to stimulate the interest of those involved, the project makes provisions for financial incentives and rural development activities directed at people actively involved in the community conservation initiatives at the local level. The community development projects are supported by the Jane Goodall Institute which, in partnership with DFGFI and local communities, creates opportunities underpinned by USAID funding for improving standards of living, health care and family planning.

Education in conservation is also a high priority for the future of the Landscape:

- Primary and secondary schools receive support to include conservation lessons in their curricula.
- A community university, approved by the government, has been developed under the Tayna program: the Tayna Center for Conservation Biology offers three-year conservation diploma courses.

The creation of these community reserves is an innovative approach conceived by the parties concerned in the Tayna Gorilla Reserve. This process has been boosted by the DFGFI Community Conservation Program launched during the war in 2001. It now supports eight NGOs that have formed UGADEC, a collective federation of community projects aimed at creating State-approved community reserves (Kakule & Mehlman,

2004) which will form a corridor between the two national parks. A second reserve of 120,000 ha, the Bakambule Community Primate Reserve (ReCoPriBa), has already been recognized by the provincial government and is awaiting recognition by the Ministry of the Environment in Kinshasa. This approach has enabled players to work on conservation, as well as draw up land use plans. This should lead to long term, more sustainable management of renewable natural resources and increase the coverage of protected areas to more than 40% of the Landscape. The designated areas for full protection in Tayna and ReCoPriBa will offer identical protection to that in the national parks and will be managed in partnership with ICCN.

Within the Tayna reserve, the Tayna Center for Conservation Biology is currently helping to enhance skills in management, conservation biology and environmental education. The first students will receive their diplomas, with support from CARPE, and go out to work in their communities at the end of 2006. Other students from other regions of DRC will be joining the program: 14 new students have been accepted as members of ICCN staff.

Figure 21.4. The eastern gorilla Gorilla beringei graueri.