

22. Ituri-Epulu-Aru Landscape

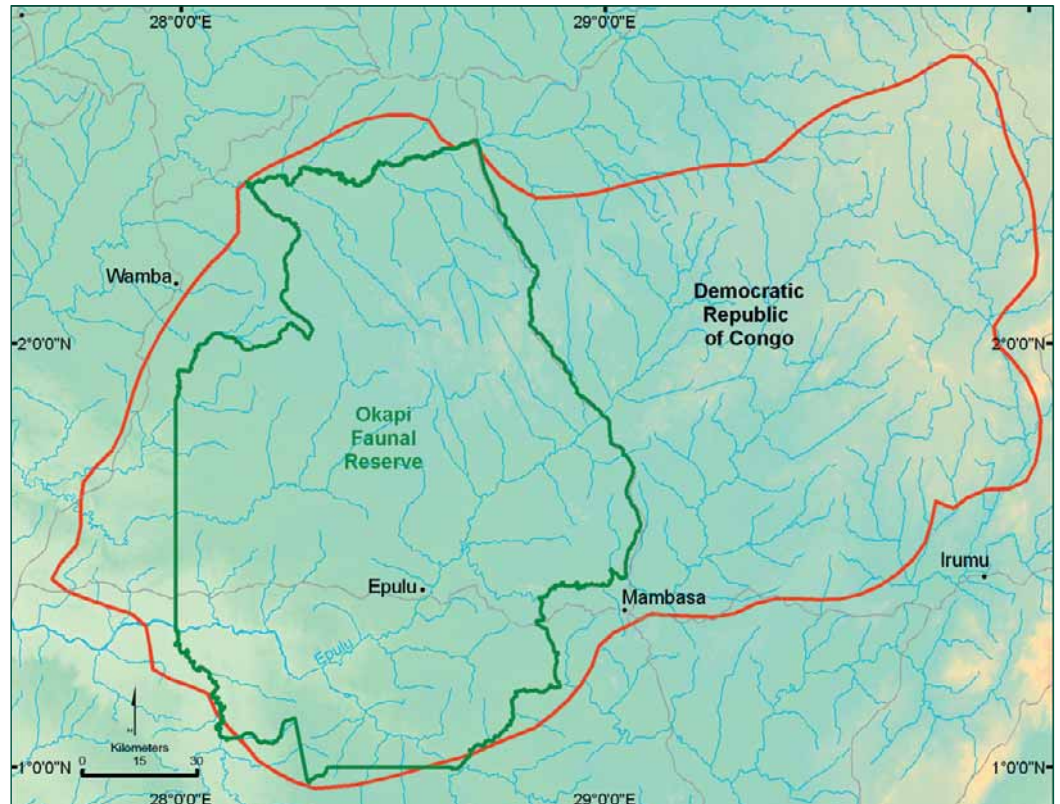


Figure 22.1. Map of Ituri-Epulu-Aru Landscape (Sources: CARPE, JRC, SRTM, SYGLAP).

The Landscape in brief

Coordinates: 2°40'37"N – 0°57'4"N; 27°41'41"E – 30°1'38"E

Area: 33,188 km²

Elevation: 700–1,300 m

Terrestrial ecoregions: Northeast Congolese forest
Northeast forest-savannah mosaic

Aquatic ecoregions: Central basin
Uélé

Protected areas: Okapi Wildlife Reserve, 1,370,000 ha, 1992

Location and area

The Landscape covers the upper basin of the Ituri River and thus the most northern part of the Congolese forest with its adjacent forest-savannah mosaic (Figure 22.1). It is mostly situated in the administrative territory of Mambasa (Ituri province). A strip of the Landscape is included in the territories of Irumu and Djugu in the Ituri province and the territories of Wamba and Watsa in the Haut-Uélé province. The Landscape touches on the province of Nord-Kivu, which is the

origin of the most important demographic and economic developments affecting the Landscape.

Physical environment

Relief and altitude

Most of the Landscape consists of a slightly undulating peneplain at an altitude of 700 to 900 m, but rising up to 1,000 m in the east. The mostly gentle relief is punctuated by low massifs covering 20 km² or more and rising to 50 to 300 m above the peneplain along old fracture lines in the Gondwanian shield. These massifs join to form a spectacular chain of granite inselbergs exposing large stretches of naked rock. This extends for over 100 km from east to west along the Ituri and Nepoko watershed in the north of the Landscape and small isolated massifs extending over 50 km in the central part of the forest.

Geology and soils

The soils of the Landscape are mostly derived from degraded granite and quartzite of the Gondwanian shield. The soils range from red oxysol, fine and highly degraded, to yellow or brown sandy clay. Alluvium deposits occupy the banks of the watercourses and poorly drained basins of the heads of numerous rivers. The soils are generally very acidic¹ and this acidity is associated with low fertility, as well as a shortage of available nitrogen and phosphorus. More fertile areas exist, particularly in association with red oxysol. A systematic evaluation of the agricultural potential in the Landscape remains to be carried out.

Hydrology

Almost all the Landscape belongs to the Congo Basin and is covered with a dense network of permanent watercourses which flow into the Upper Ituri and its main tributaries: the Epulu, Nepoko, Nduye, Lenda, Ebiena and Ngayu rivers. A small part of the Landscape belongs to the Kibali-Bomokandi Basin, which constitutes the head of the Uélé-Oubangui system.

The region's rivers have moderate high waters with the maximum reached between September and November. After heavy rains, the small watercourses undergo brief high waters which disturb their beds and take away debris. Flood plains are rare in the Landscape and are limited to the largest rivers in the west, especially the Ituri, the Lower Ngayu and the Lower Lenda. The heads of numerous streams have poorly drained areas that create dendriform networks of marshy environments. So far, the heads of most of the basins draining the Landscape have been very little affected by human activities, unlike the case with rivers originating outside the Landscape. The latter often have more turbid waters associated with deforestation and other changes. The alluvium load in the Ebiena River, which has its sources in the denuded regions of Kivu, can be very high. The alluvium load of the Ituri River, which has its origin in the extensively logged areas in the east of the Landscape, has increased appreciably over the last ten years.

There is still no hydroelectric development in the Landscape. With its extremely high gradients and vast volumes of water, the Upper Ituri and its main tributaries represent a substantial potential in this field.

Climate

The average daily temperature varies between 23°C and 25.5°C. Rainfall is bimodal, with rainy seasons centered on the equinoxes and dry periods centered on the solstices. Inter-annual variations can be considerable and are partly linked to the variability of the passing of the intertropical convergence. Rains often beat down during storms and are mainly caused by the climatic system of the Congo Basin. The monsoon effects of the Indian Ocean are not known², but it seems that the region's climate is influenced by dynamics outside the Congo Basin, leading one to suppose that it could undergo rapid changes.

The average annual rainfall in the Landscape is 1,600 to 2,000 mm. The driest month is January, the only time when the average rainfall dips below 50 mm in some parts of the Landscape. During the dry season, the sky is completely cloudless, humidity is low and evaporation very high. Even in dense forest, water losses are substantial. Some years, these dry periods are particularly long. In Epulu, in the center of the forest, during the span of the last 20 years, at least five years have had a sufficiently long dry period for forest fires to develop. As it is situated on the edge of the forest block and human impacts are increasing, the Ituri Landscape is very vulnerable to degradation and changes in its flora, even during relatively short periods of drought.

Vegetation

Most of the Landscape is covered with dense evergreen terra firma forests with a closed canopy (Figure 22.2). They comprise forests with a monodominance of *Gilbertiodendron dewevrei* (mbau), which forms both the canopy and the undergrowth, and mixed forests in which no species is predominant, but where other Caesalpinioideae, such as *Julbernardia seretii* and *Cynometra alexandri*, are abundant. In the north and the east of the Landscape, and on the dry slopes, there are semi-deciduous forests whose canopies contain more light-demanding species, such as *Entandrophragma spp.*, *Khaya anthotheca*, *Albizia spp.* and *Canarium schweinfurthii*, and a growing proportion of dendritic Euphorbiaceae and Rubiaceae. At the northern and eastern ends of the forests, the dense forests turn into a mosaic of dry forests, evergreen forest galleries and wooded savannahs. Swamp forests grow along watercourses or in poorly drained areas. They are characterized by the presence of *Hallea stipulosa*, *Uapaca*

¹ The average pH values are around 4 in the Epulu area, where measurements were taken recently.

² At the end of the dry season, black rain fell on the Ituri forests during the first Gulf War in 1990-1991. Large fires in the oilfields caused enormous black clouds over the Persian Gulf and the northern Indian Ocean. These observations suggest an eastern influence on the Ituri climatic system.

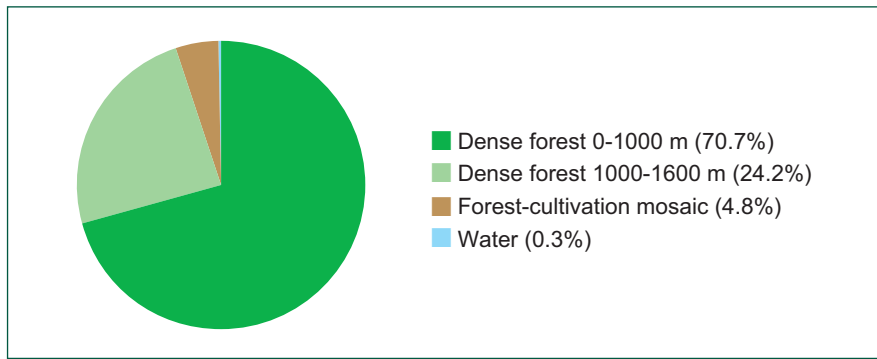


Figure 22.2. Main vegetation types
(Source: JRC).

guineensis, and a local dominance of *Raphia* sp.. Lianas are abundant.

On the shallow and rocky soils on the granite inselbergs are highly specialized xerophile plant formations comprising many species of plants that have a limited distribution and are of global importance for conservation.

Throughout the Landscape there are also clearings, called *edo* locally, which are maintained by elephants, but used by a wide variety of fauna. The size of clearings varies from less than a hectare to several hectares. They are recolonized by the forest when the influence of elephants disappears.

Secondary forests of varying ages cover large parts of the Landscape, partly as a result of natural causes. Violent storms effectively tear large holes in the forest and a mosaic of primary and secondary forest develops. These mosaics can cover an area of more than 10,000 ha³. Over the last 25 years, three violent storms that affected the canopy over an area of more than 1,000 ha were recorded within an area of 500 km² around the Epulu station. Secondary forests are also the result of human activities: shifting agriculture and, to a lesser extent, small-scale logging. Around 2% of land in the reserve, as well as land outside, is covered with anthropogenic environments of different ages. This area of old agricultural land is limited to a 6-km wide strip along the road that passes through the Landscape. In the southeast of the Landscape, degradation of the forests and deforestation have increased over recent decades, causing the formation of vast areas covered with a mosaic of degraded forest and cultivated land. The extension of this area is a threat to the Landscape.

From a floristic point of view, the Ituri forest is very diverse. CEFRECOF data and additional collections reveal the presence of 1,190 species of plants in the dense forests around the Epulu station⁴. Collections in other areas of the Landscape could raise this number to 1,500 and perhaps even 2,500 if the forest-savannah mosaic is included.

Fauna

Mammals

The Ituri forests are exceptionally rich in mammals and a total of 90 species have been found in the central sector. These forests are home to thirteen species of diurnal primates—the highest number for an African forest—and six species of duiker. The Landscape contains populations of world importance for several species with a limited distribution, endemic or almost endemic to the DRC: the okapi *Okapia johnstoni* (Figure 22.3), the aquatic genet *Osbornictis piscivora*, the giant genet *Genetta victoriae* and Hamlyn's monkey *Cercopithecus hamlyni*. It also has large populations of globally threatened species, such as the forest elephant *Loxodonta africana cyclotis* and the chimpanzee *Pan troglodytes*. Other important species are L'Hoest's monkey *Cercopithecus lhoesti*, the leopard *Panthera pardus*, the Cape buffalo *Syncerus caffer nanus*, the bongo *Tragelaphus euryceros*, the sitatunga *Tragelaphus spekei*, the African golden cat *Felis aurata*, the giant forest hog *Hylochoerus meinertzhageni*, the red river hog *Potamochoerus porcus*, the water chevrotain *Hyemoschus aquaticus* and the forest aardvark *Orycteropus afer eriksonni*.

The forest-savannah ecotone has not yet been systematically inventoried, but reports by missionaries before the recent civil war mention the lion *Panthera leo*, the spotted hyena *Crocuta crocuta*, the hippopotamus *Hippopotamus amphibius*, the East African Defassa waterbuck *Kobus ellipsiprymnus defassa*, the bongo *Tragelaphus euryceros*, the bushbuck *Tragelaphus scriptus*, the bohor reedbuck *Redunca redunca* and the vervet monkey *Cercopithecus aethiopicus*. The skin of a little known meerkat, Dyboswki's meerkat *Dologale dybowski*, a species which lives at the edge of forests, was collected recently. This suggests that the forest-savannah mosaic could contain specialized fauna that is rare or absent in other parts of the Congo Basin and absent from the more arid regions to the east and the north.

Birds

Ornithological inventories have only covered small portions of the Landscape, but at least 333 species have been observed in the central sector of the reserve. Systematic observations in the Epulu area have revealed a rich avifauna and a large number of specialized forest species, particularly among the ground thrushes *Zoothera* sp., Timalidae and Accipitridae. The golden-naped

³ In these areas, the undergrowth, including advanced regrowth of canopy species, is not destroyed by storms and is 'liberated' by the opening-up of the canopy, which allows rapid regeneration.

⁴ The botanical inventories carried out by the *Centre de formation et de recherche en conservation forestière* (CEFRECOF) since 1994 in the Epulu sector of the Landscape have revealed the presence of 700 woody plants with a stem diameter of over 1 cm in four parcels of 10 ha, including 460 species of trees and 243 species of lianas.



Figure 22.3. The Okapi *Okapia johnstoni*.

weaver *Ploceus aureonucha* is endemic to the Ituri forest.

Herpetofauna

There are no recent inventories and research will be necessary before the value of the Landscape for this group of animals can be estimated. However, collections in museums suggest that the Ituri forests are rich in reptiles, with three species of crocodiles, but that they do not constitute a 'hot spot' in this field. Very little is known of the amphibians.

Ichthyofauna

The Ituri River and its tributaries contain an ichthyofauna that is still largely unknown. It is fished locally, although not intensively at present. Given the fact that the Ituri Basin is well upstream in the Congo Basin, its fauna is not as rich as in the central basin. Furthermore, some major rapids on the middle course of the Ituri create a biogeographical barrier which isolates this river from the Congo River. Preliminary inventories carried out at the beginning of the 1980s showed that the ichthyofauna consisted primarily of generalist species that were usually widely distributed; it also included some species that have not yet been found elsewhere and specialist species such as rock browsers, which live in torrents and are probably endemic to the Ituri Basin. Some of these species were unknown to local fishermen whose methods are inappropriate for catching these specialist species.

Invertebrates

Diurnal butterflies are the only invertebrates that have been the subject of systematic inventories in the Landscape. Collections have been made in three places. In Epulu (altitude 750 m),

the 6,251 specimens collected belong to 116 genera and 487 species. They include the most eastern collections for five species previously known only in West or Central-West Africa. These species are absent at the collection spots in the east of the Landscape, where the altitude exceeds 900 m and where there are species linked to the higher altitudes of the Albertine Rift (Ducarme, pers. comm.). These results confirm the importance of the Ituri forests as areas where species from separate biogeographical regions come together.

Humans in the Landscape

Density and distribution

Until recently, the Ituri forest was one of the least populated areas in the northeast of the DRC, despite a very long history of human occupation. Cut stone tools found at the eastern edge of the Landscape indicate human presence in the Middle Stone Age. However, it is not certain if the region was covered in forests at that time. Recent excavations in sheltered areas under rocks in the north of the Landscape show that a few millennia ago the forest was inhabited, but played only a minor role in the development of human cultures, particularly in the expansion of iron-working.

When the first Europeans arrived at the end of the 19th century and the first documents were written, the forests of Upper Ituri contained only small scattered villages and vast areas were not inhabited on a permanent basis⁵.

The human populations in the Landscape increased during the colonial period, following the opening-up of the first roads and the development of mining and agricultural plantations in the region. Over the last 60 years, and most notably in the last 30, considerable migratory movements have invaded large portions of the Landscape. This immigration continued even during the latest conflicts between 1996 and 2003 and in spite of the clashes between rival militias who were present throughout the Landscape. Some immigrants were fleeing insecurity in their home region; however, even during the periods of conflict most of them were motivated by economic opportunities. These opportunities included easy access to cultivable land, jobs in mining or small-scale forestry and the small businesses that these activities generated.

Most recent immigrants in the Landscape come from the densely populated heights of the Albertine Rift, where the population density is over 100 inhabitants/km² and accessing new agricultural land is becoming difficult. The popula-

⁵ The members of the first expedition, which visited the region around the end of the 1880s and had to obtain supplies from the local inhabitants, found so few villages that they nearly starved to death. The Arab slave trade and clashes between Westerners and Arabs in this region had perhaps reduced even further the already sparse populations. Whatever the case may be, the Ituri forests were less inhabited than the forests situated just to the west or the forest-savannah ecotone to the north.

tions of Beni, Butembo and Bunia, the major urban centers on the eastern edge of the Landscape, are increasing at the rate of 4.2% a year. In the northwest, the populations of the Isiro region are also growing quickly. An analysis of satellite images taken over the last 20 years shows that the regions adjacent to the Ituri Landscape are undergoing the most substantial deforestation in DRC.

Two vast blocks of the Landscape still have a low human population density:

- The wildlife reserve (around 1,400,000 ha), where a census in 2003, at the beginning of the CARPE-CBFP program, revealed that there were 17,000 people in the reserve (1.2/km²) and 37,000 people within 15 km of the limits.
- Immediately to the east of the reserve, the Mai-Tatu block (1,200,000 ha) has not yet been the subject of censuses, but is constantly occupied by military poachers, which suggests that it still contains sizeable animal populations.

The total human population of the Landscape is unknown. Mambasa and Nia-Nia, the two major centers, have fewer than 20,000 inhabitants, but are growing rapidly. Very roughly, the total population of the Landscape and its immediate periphery can be estimated at 300,000. The population of the Beni and Butembo region is about 1.5 million and has a growth rate of 2.5-2.8% a year.

Ethnic groups

The semi-nomadic Mbuti and Efe (Figure 22.4) were probably the first inhabitants of the region, but when they arrived is unknown. While their way of life today is similar to what it was originally, these Pygmies have not been able to live inside the forest independently of other ethnic groups and had to colonize the forest at the same time as groups practicing shifting agriculture. The latter are believed to have come to the region 2,000-3,000 years ago. At present, the number of Pygmies in the Landscape is estimated at 30,000. They continue to lead a semi-nomadic lifestyle, but still depend heavily on the Bantu populations.

Among the forest farmers, the main ethnic groups are the Bila, Ndaka, Lese, Mbo and Mamvu. They depend on shifting agriculture, supplemented by fishing and hunting. The Ngwana arrived in the Landscape with the Arab slave trade in the 19th century. During the colonial era, new populations were added. The most numerous are

the Nande, from the mountains to the east of the landscape, and the Budu, from densely populated regions to the north and west. Many of the newcomers came to rejoin members of their family or clan. Today, all the centers where several families live contain several ethnic groups. The population of Epulu, with 2,000 inhabitants, comprises over 30 different ethnic groups.

Activities

Subsistence agriculture

Manioc, banana-plantain, rainfed rice, taro, yams and groundnuts are the main crops in the Landscape. Maize is used for the local production of alcohol. The agriculture practiced by the groups who traditionally live in the forest is based on a rotation system of two years of crops and ten years of fallow. Fields are small, generally less than 2 ha, and represent only a small proportion of the agricultural mosaic. The long periods of fallow allow the soil to regain its fertility and provide good habitats for fauna. The populations of certain animal species are denser in these secondary environments than in the adjacent forests. In areas where fallow periods are still long, clearing of the primary forest is very limited. The mosaic of secondary forests is rich in palm trees *Elaeis guineensis* and *Raphia sp.*, which are rare in dense forests.

The recent immigrants practice a more intensive agriculture, with larger fields, shorter fallow periods and more extensive clearing of the primary forest. Although more research is necessary, studies show that fallow periods of five years or less lead to the soil becoming depleted, regeneration of forest coming to a halt and the forest being replaced by prairies of *Imperata* or thickets of bushes and lianas.

Cash-crop agriculture

During the late colonial period and up to the 1970s, there was substantial production in the Landscape of products for marketing: rainfed rice and palm oil were intended for the urban and mining centers and coffee for export. The traditional forest populations had very few cash crops. Coffee was produced by small family businesses, generally belonging to recent immigrants, or vast plantations typically owned by Europeans. In the 1970s, the expatriates' companies were nationalized and, subsequently, quickly abandoned. By the end of the 1970s, the road network began to deteriorate, access to markets became difficult, prices fell and crops were gradually abandoned. Today, production is minimal and there are no longer any coffee plantations. These plantations



Figure 22.4. Semi-nomadic hunters.

have been converted into land for subsistence agriculture or have been invaded by the forest.

Fishing

Small-scale fishing using nets, traps, lines and hooks is the most important activity after agriculture. In some communities near watercourses, fishing is the main activity. Immigrants from lower down the hydrological basin bring new methods and fish more intensively. An inventory of the ichthyofauna and its productivity is an essential priority in the Landscape.

Hunting

Hunting is practiced throughout the Landscape and is the primary activity of the Mbuti and Efe, who generally practice hunting by tracking. The use of nets and rounding-up methods is practiced in the center and south of the Landscape, while hunting with bows and arrows is dominant in the north and the east. Eight species of small ungulates are the main targets of this hunting. Hunters using dogs also catch several species of primates and small animals such as meerkats or rodents. When hunting with nets or bows and arrows, many animals manage to escape. This reduces the impact of hunting and makes it profitable only when there are large numbers of animals.

Mbuti hunters have hunting territories with more or less fixed camp locations, which are used on a periodic basis by clan or family groups⁶. The villagers hunt as well, but in their case this ac-

tivity is carried out full-time by a few specialized individuals. Village hunters primarily use snares, which ensure a degree of success even when the animal populations are low. Budu hunters recently extended hunting with snares deep into the Landscape from the west. Few recent immigrants from Kivu are specialized hunters.

The use of firearms was not common until the civil war, when rival militia, joined by the national police, set themselves up in the Landscape to control access to gold and timber or to organize commercial and ivory hunting. At present, military arms are still circulating in the Landscape.

Incomes

Very few inhabitants of the Landscape have regular wages. Most of those with wages are employed through churches or international NGOs, including conservation NGOs.

The collapse of the road network in the 1970s has limited both access to markets and development possibilities. At present, bicycles are the main means of transport on what is left of the roads⁷. The economic context of the Landscape will probably change quickly when the roads are rebuilt. Repairs to the trans-African highway between Kisangani and Bunia are already under way. This road will facilitate immigration and improved access to markets will encourage the extraction of forest resources. In the absence of any controls, mitigation measures and management,

⁶ Preliminary mapping of these hunting areas has been undertaken around Epulu and it remains to be seen whether this type of demarcation is as extensive in other sections of the Landscape.

⁷ On the road that used to be trans-African, over 250 tons of goods were carried to Epulu on bicycles over a four-month period in 2002. Mostly, it consisted of cheap foodstuffs. There was no bushmeat and none of the agricultural products came from the Landscape.

the Landscape will come under unprecedented threats⁸.

Mining

Ituri is rich in minerals: gold, coltan and diamonds. Gold mining dates back to the colonial period. Kilo-Moto was one of the main companies at that time, located near the eastern edge of the Landscape. Access to mining resources was a major issue in the civil war and is still at the heart of the present conflicts. Hundreds of small permanent or semi-permanent mines have become active since the legalization of small-scale mining in the 1980s. No Landscape-wide survey exists, but at least 25 camps are operational in the wildlife reserve. Today, all mining operations are on a small scale, even in the Kilo-Moto concession where miners work under contract. Most operations are concerned with alluvial gold, but a growing number of miners are trying to extract gold from the parent rock after grinding and washing it with mercury. This trend will increase as the price of gold increases.

Land use

Most of the Landscape is not managed or legally allocated (Figure 22.5). The largest legal area is the Okapi Wildlife Reserve. As concerns extractive areas, there is an ENRA concession.

Logging

Logging is concentrated in semi-deciduous forests, near the transitional area between the dense forests and the wooded savannahs in the east, where valuable species such as *Milicia excelsa*, *Entandrophragma sp.* and *Khaya anthotheca* are more abundant.

There were no concessions in the initial Landscape, but in 2004 the limits of the Landscape were extended to encompass the only legally registered logging area in eastern DRC. It covers about 52,000 ha and has been allocated to ENRA, which has its base in Beni. This small company produces 5,000-7,000 m³ of sawn timber a year. Another company, Dara Forest, was active during the period of the rebellion, but it was unable to legalize its activities, most likely due to the fact that it was involved in illegal exploitation of the country's resources during the war. It is continuing with its illegal activities.

Most logging in the Landscape is in the form of small-scale activities stretching from the south and east right across the Landscape⁹. There is virtually no logging in the north or west, because of

the very bad state of the roads. This illegal small-scale logging and agriculture are major threats for the ENRA concession.

Reasons for the identification of the Landscape

- (1) The Landscape is one of the main reservoirs of biodiversity on the continent.
- (2) The Landscape is one of the last refuges for large fauna in DRC, especially for okapi, the last large populations of chimpanzees and forest elephants¹⁰.
- (3) BirdLife International has included the Ituri forest among its Important Bird Areas (IBA).
- (4) The Landscape has the last large forests where populations of semi-nomadic hunter-gatherers continue to live and the Okapi Wildlife Reserve constitutes a unique opportunity to develop participatory wildlife management with these populations, who represent 18% of the human population in the reserve. Without a legal definition of land uses, controls on immigration and regulations protecting traditional hunting, the Mbuti and the Efe will quickly become a minority on their own lands¹¹.

Conservation

History

The exceptionality of the Ituri forest was recognized as soon as the first biological explorations of the region were carried out at the beginning of the 20th century. Active conservation began with the installation of the station at Epulu, with a view to catching live okapis for zoos around the world. To this effect, the station set up a system of zones for catching the animals along the road running from the east of Nia-Nia to the west of Mambasa. In these zones, the okapis' habitat was left intact and those inside the zones were protected by the local populations, who were the first to be hired during the capturing campaigns.

Management of the station was taken over by ICCN, which continued the tradition of protected capture areas. During the 1980s, it became clear that the traditional authority was not going to be able to keep up this protection when faced with the level of immigration into the forest. Consequently, in 1992, the wildlife reserve was created and placed under the authority of ICCN. The legal text creating this protected area mentions conservation as a priority, but also allows for

⁸ At the moment and for the foreseeable future, the populations of the Landscape have no means of generating income other than by intensifying and marketing the products of subsistence activities, especially agriculture, hunting, fishing, crafts, small-scale logging, mineral extraction or small businesses. All of these activities are going to have to be managed to prevent degradation of the Landscape.

⁹ These small-scale loggers work in little associations using chainsaws to produce rough-sawn timber on the felling site and use modified bicycles to carry the wood as far as the road, where it is loaded onto vehicles for export to East Africa. About 150 loggers were active in the southeast of the Landscape, most of them without legal permits.

¹⁰ Recent studies over 5,500 km² in the central part of the reserve showed that 3,000 elephants have survived the war. Elephants also exist in another area of 3,000 km² and in an unknown portion of the Mai-Tatu block, where surveys are planned.

¹¹ This tendency is already clearly visible with the Pygmies living in the immigration areas or outside the Landscape.

a lot of freedom in the management of the reserve to accommodate access by the local populations and traditional non-destructive hunting. The reserve covers 1,370,000 ha, which represents over a third of the Landscape. In 1996, it became a World Heritage Site, on the basis of its faunal richness and its importance for the traditional peoples of the forest.

A coalition comprising ICCN and some international NGOs (WCS, WWF and GIC) has worked on conservation of the reserve since the mid-1980s, particularly through the creation of a research and training center (CEFRECOF). At the beginning of the civil war, ICCN, WCS and GIC, with the support of the United Nations through UNESCO, formed a partnership ensuring the permanent presence of conservation personnel in the reserve throughout most of the troubles. This presence continues to supply information which has allowed the reserve to be supported at the international diplomatic level and has protected its headquarters and at least some of its resources.

Since the mid-1990s, in accordance with the ICCN mandate to manage the reserve, the original capture areas have been consolidated to serve as the basis for a formal zoning plan, which continued to be developed during the conflicts and still constitutes a priority management objective. This zoning provides for the creation of 22 agricultural areas—six already existed—linked to well-established communities living on the edge of or in the reserve. Clearing of land inside the reserve will be limited to these areas and demarcated according to the present and future needs of the populations. Two additional areas have been proposed, but their limits and management method are still to be defined. The first is a traditional hunting area which will cover most of the reserve and will be used exclusively by the Mbuti and the Efe. The second will be an integrated protection area intended to protect large animal populations from any form of exploitation.

Players

The players active at present are:

- ICCN
- the local populations involved in the zoning program for the reserve
- the territorial administration, comprising group leaders, three sector leaders and the administrator of the territory of Mambasa
- international NGOs: WCS and Gilman International Conservation (GIC)
- UNESCO in support of the information

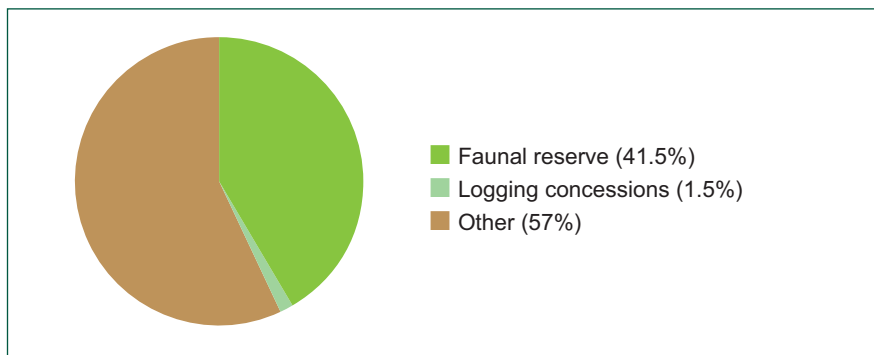


Figure 22.5. Main land uses.

management unit based in the reserve, which is linked to ICCN

- ENRA, the private logging company which wants to improve the management of its resources
- the association of small-scale loggers

Direct threats

(1) Small-scale logging and agriculture

These two activities fragment the forest. This process is well advanced at the southeastern edge of the Landscape, demonstrating what must absolutely be avoided if the Landscape is to retain its biological value and its importance for the traditional peoples of the forest¹². New access to markets and the rise in prices could set cash-crop agriculture in motion. Without sound management, this could open up the forest to major clearing and the arrival of new populations.

(2) Ivory hunting

Elephant hunting and the illegal ivory trade started in 1996 with the beginning of the civil war. They expanded in 2002-2004 when rival militia, joined by the national police, established hunting camps in the Landscape, recruited and armed professional hunters and signed contracts with local dealers to sell the meat and ivory¹³. ICCN drew up a report on these massacres, which perhaps had the effect of the military and poaching camps being removed in 2004 and 2005. Elephant poaching has now been reduced considerably, but there are far fewer elephants to hunt and the animals that survived are harder to find. An unknown number of hunting units are still active in the Mai-Tatu block, where poaching continues. ICCN has found that the number of military arms in circulation has fallen, but they are still present in the reserve.

¹² The increase in the settlement of populations begins with the creation of small isolated hamlets and the introduction of small-scale logging from existing roads. These gaps grow and increase in number, forming a mosaic of secondary vegetation and fields. In the more advanced stages, the forest is severely fragmented and/or reduced and new villages spring up, connected by trails and footpaths.

¹³ Over a 12-month period from 2002 to 2003, ICCN information gathering services identified 17 tons of ivory crossing the Landscape. They were unable to do anything about it due to the high-level of political protection enjoyed by some poachers.

(3) Hunting for meat

Hunting is very widespread and its impact on the fauna varies according to the methods used. Hunting with snares, which is very destructive, has grown considerably over the course of the last decade and has now reached remote regions of the Landscape. The trade in bushmeat has also increased significantly in the reserve and the Mai Tatu block. Animal populations in the southern part of the Landscape and the areas around large villages have been reduced to the point where meat consumption in these areas is virtually nonexistent. The trading network involves dealers and buyers in the regions of Beni, Butembo, Kisangani and Isiro, but there is also considerable meat consumption in Mambasa and Epulu, the headquarters of the reserve.

(4) Small-scale mining

This is a localized threat, but it can have major repercussions due to the fact that it is accompanied by uncontrolled population movements and an increase in the trade in bushmeat. Many small mines are characterized by significant variations in the level of activities; however, when mines are eventually abandoned the populations do not always leave the invaded areas. In this way, mining contributes towards the establishment of permanent communities. A recent census conducted in the reserve, where mining is illegal, reveals that many new immigrants are former miners who came from far away and have decided to become farmers.

(5) Commercial fishing

Recent observations suggest that small-scale fishing is growing in the Landscape, but it does not constitute a threat at the moment. With road repairs, this growth will continue and fish stocks will drop in the areas where fishing is heaviest.

Indirect threats

(1) Increase in human populations

A considerable increase in the populations, especially through immigration, has been observed in several places in the Landscape. The recent conflicts have not changed this trend and this increase will probably accelerate with improved access and the return of a certain level of security. In the reserve, censuses carried out by WCS between 1994 and 2003 reveal an increase of 6-16% in the major centers. Sometimes, this growth can be rapid: in 2004, the population of Epulu rose from 1,570 to 2,265 in six months when security returned and the NGOs supporting the reserve resumed their activities. Some of these increases

can be temporary, but it is clear that the overall population of the Landscape has risen considerably over the last 50 years.

(2) Lack of management capacity

The weakness of the local government authorities, including a lack of funds, weak institutions, incompetence and corruption, means that the State agencies responsible for the monitoring and management of natural resources are unable to carry out their tasks. The development of any new institutional platform for the implementation of management in the Landscape is also handicapped by the lack of a mandate. This compromises efforts to resolve conflicts concerning the use of resources and weakens the ability to control abuses. Without a clear mandate, local management programs can be wiped out or brushed aside by external forces that are more politically powerful. Even when such a mandate exists, implementing it can be compromised: ENRA, for example, has logging rights on its concession, but cannot prevent either illegal logging or illegal installations.

The problem of a lack of mandates is one of the reasons why conservation activities are focused on the reserve. Within its limits, ICCN exercises a mandate that covers a large number of management activities and, although some of these activities still have to be legally and administratively confirmed, its authority is clear. This is not the case outside the reserve or in the Landscape. Establishing mandates for these areas remains a major challenge.

Financing and conservation

Most of the financing for the Landscape comes from CARPE. Additional funds from WCS and GIC are primarily devoted to the reserve. Anticipated finance includes 3 million euros for the reserve from the German development bank (KfW) between 2007 and 2012 and US \$100,000 from UNESCO's emergency fund for 2007-2009. Outside the reserve, ENRA should be investing funds in the management of its concession, but as long as the limits are not respected and illegal logging continues, this company will not continue to make investments in sustainable forestry. The Catholic church of Mambasa and several humanitarian NGOs based in the Landscape are also injecting funds into development. Coordination among these players is only in its infancy. As for ICCN, the organization provides little financing for the reserve and the Ministries in charge of the environment and mines make even fewer funds available for the Landscape.

Environmental education and capacity building

Environmental education programs were first initiated by GIC in the reserve 15 years ago. Since the end of the civil war, these have been renewed and extended beyond the reserve. These programs are increasingly seen not only as a way of making the values of the reserve known, but also as a basis for a dialogue and exchange of information that can facilitate the development and implementation of the zoning of the reserve.

Management in the field of renewable natural resources

(1) At the Landscape level

There is no zoning or other activity in the pipeline at the Landscape level.

(2) In the reserve

Conservation-related activities are based in the reserve and focus on two crucial activities:

- anti-poaching patrols carried out by ICCN
- zoning of the different forms of land use undertaken by ICCN and its NGO partners

The reserve is to be split up into three types of areas:

- agricultural areas
- small areas where human settlements and land clearing will be permitted
- hunting areas, covering most of the reserve, where only traditional methods (nets, bows and arrows) will be allowed
- total protection areas for the conservation of key species

These activities require improved governance, particularly as relates to controls on immigration. To this effect, ICCN, in conjunction with its partners and the administrative authorities, is testing a pilot program to regulate access and the permitted length of residence in the reserve, through the introduction of a residence permit. Four types of status will be recognized:

- permanent resident
- temporary stay
- in transit
- returning to place of residence

Only the members of ethnic groups who traditionally used to live in the reserve and whose home villages were in the reserve can obtain the status of returning resident. The zoning program, including controls on immigration, has incorporated several administrative levels. Legalization of these activities must be pursued.

(3) In the extraction areas

The CARPE program for the Landscape is working with ENRA in an effort to establish a plan for the sustainable management of the concession. This plan will serve as a model for another proposed concession to be set up beyond the small-scale logging and agriculture front, so as to form a buffer zone at the edge of the reserve.

(4) In the rural areas

For zoning to be successful, shifting agriculture must be slowed down and agricultural production increased through improved methods. Towards this end, WCS and GIC have undertaken several assistance projects for farmers, which include technical support, the distribution of selected seeds and tools and the introduction of new crops, agro-forestry methods, composting and fish farming. These promising initiatives must now be assessed.

Human-animal conflicts must be controlled, especially as the animal populations around crops will increase.

Hunting must be managed. The present approach involves studying how traditional hunters use and manage access to their forests. The information collected will be used to develop culturally acceptable recommendations for controlling access and preventing the most intensive forms of commercial hunting, concurrently consolidating and confirming the rights and responsibilities of the traditional communities with respect to hunting.

Small-scale logging must be managed through support for legally recognized associations of small-scale loggers already established in the Landscape and its periphery. Major problems to be resolved concern the allocation and protection of concessions, working practices, controls on environmental attacks and taxation.

Research and monitoring

In the past, the wildlife reserve and the Ituri forest have served as a framework for basic research programs, which themselves serve as the basis for the management programs being developed today. These interventions must be continued and extended to address new challenges that are already taking shape.

The most important research over the last 30 years has concerned key species (okapi, duiker, elephant), basic studies on forest dynamics and phenology and socioeconomic subjects related to the traditional peoples of the forest and the new immigrants. Since it was created in 1990, CEFRECOF in Epulu has also served as a training and applied research center supporting the wildlife reserve.

Present work centers on obtaining post-conflict data on the biological and socioeconomic state of the Landscape and on the impacts of its utilization by human populations. Approximately 40% of the inventories have been completed. They have collected data on action to combat poaching and on the development of zoning. A program based at ICCN and supported by Belgium and UNESCO has produced a basic map of the wildlife reserve and is now developing capacity to manage data concerning the protected area in Epulu.

Transport and tourism

Before the war, Epulu was an important transit center for commercial and tourist vehicles traveling to or from Kisangani. Every day, 10-20 trucks stopped at Epulu and the local populations were able to sell their agricultural produce or buy salt, paraffin, cigarettes, food, clothing and many other items. Tourism was also an important source of income for local populations: between 1987 and 1993, 22,775 tourists visited Epulu to see the okapis in the captivity of their vast enclosures.