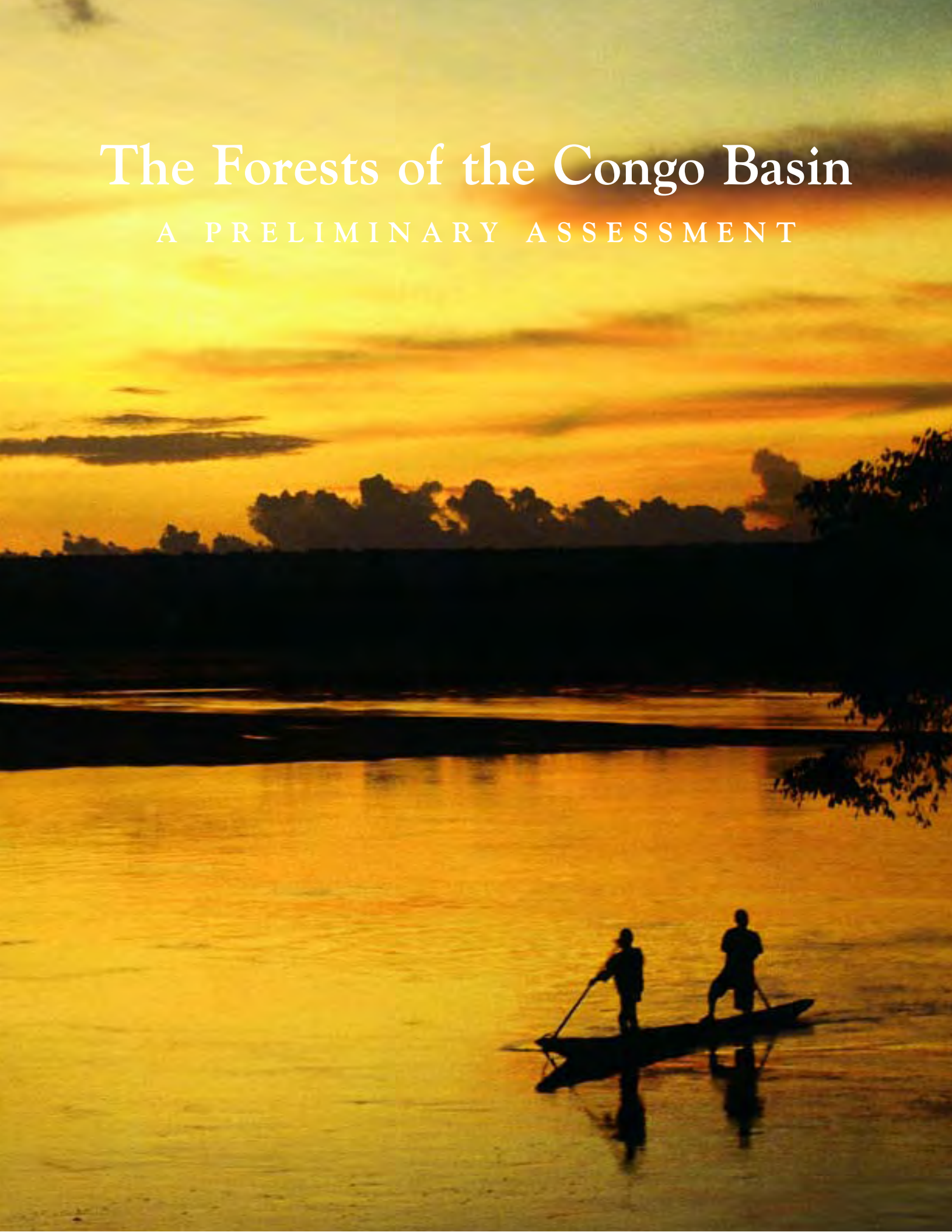
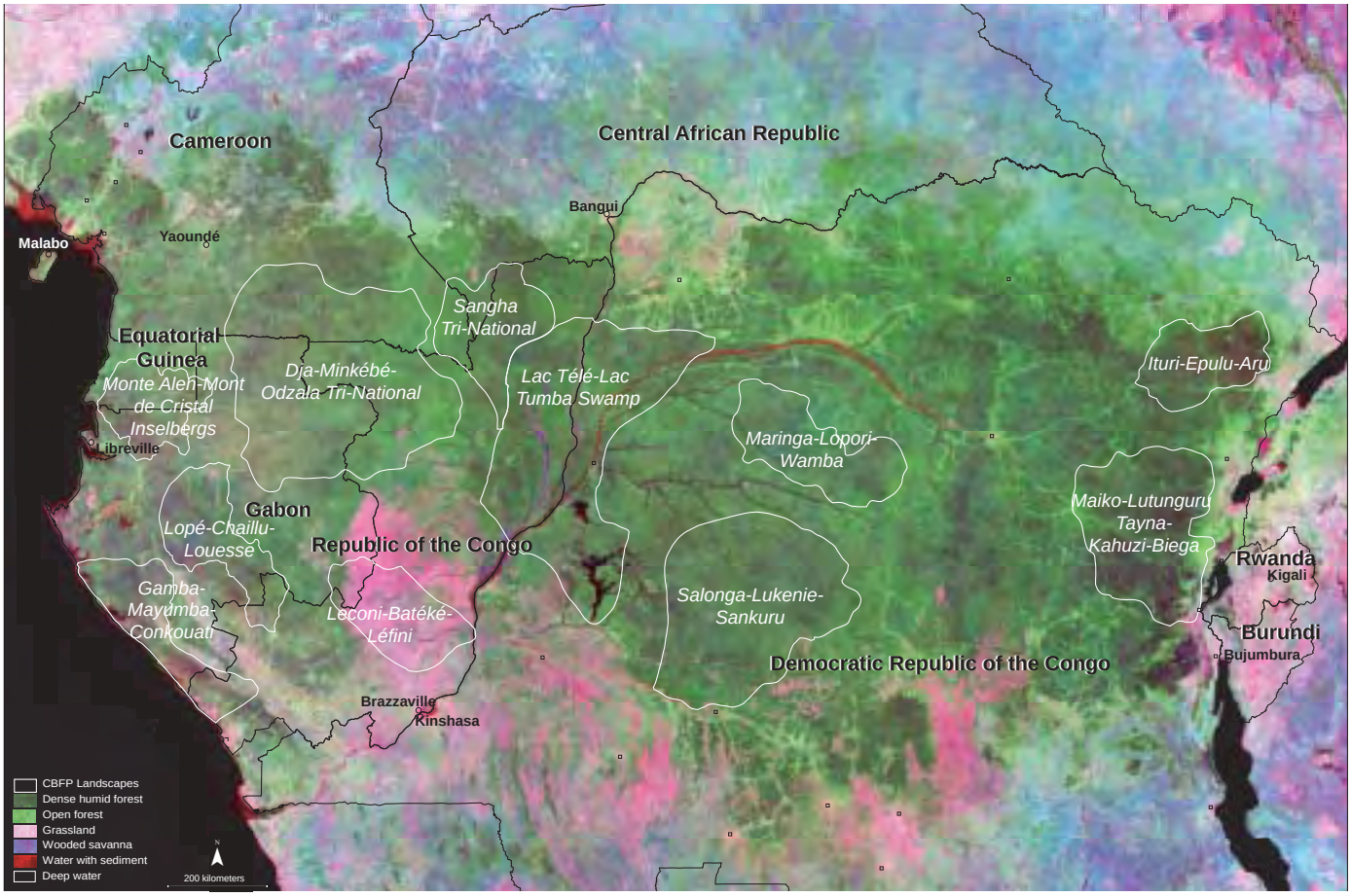
The Forests of the Congo Basin

A PRELIMINARY ASSESSMENT



Protecting ecosystems and biodiversity while advancing human well-being in the Congo Basin Forest



This image of the Congo Basin Forest was created by combining MODIS satellite images collected between 1999 and 2002 to obtain a cloud-free view. It shows dense forest in dark green and degraded forest or agricultural areas in light green. Grassland appears in pink and wooded savanna in violet. The Congo Basin Forest Partnership (CBFP) conservation activities focus on 11 landscapes (outlined in white) that were selected by more than 160 regional and international experts at a workshop in Libreville in April 2000. The landscapes were selected because of their outstanding biodiversity (including their concentration of endemic species), because they encompass intact populations of larger mammals (e.g., elephant and gorilla in forest wilderness), or because they represent important and distinctive habitats and communities of species.

These priority landscapes do not mean protected areas—rather, they represent zones within which conservation should play a prominent role, through various land use activities in protected areas and corridors, and through sustainable forestry management and community-based natural resource management. Within these landscapes, CBFP is working with a range of government and nongovernmental organizations to conserve biodiversity and promote sustainable land use practices.

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2005

The Congo Basin Forest Partnership includes the following active partners:

The Governments of:

Cameroon
Central African Republic
Democratic Republic of the Congo
Equatorial Guinea
Gabon
Republic of the Congo

Belgium
Canada
France
Germany
Japan
South Africa
United Kingdom
United States

Intergovernmental organizations:

European Commission
International Tropical Timber Organization
World Bank
World Conservation Union

Nongovernmental organizations, universities, and private sector organizations:

African Wildlife Foundation
American Forest and Paper Association
Association Technique Internationale des Bois Tropicaux
Center for International Forestry Research
Conservation International
Forest Trends
Jane Goodall Institute
Society of American Foresters
University of Maryland
Wildlife Conservation Society
World Resources Institute
World Wildlife Fund (World Wide Fund for Nature)

And numerous others

The Forests of the Congo Basin: A Preliminary Assessment
The text of this document is available on the Internet at:
http://carpe.umd.edu/products/PDF_Files/FOCB_APrelimAssess.pdf

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Richard Ruggiero: 8
Gretchen Walters, Missouri Botanical Garden (MBG): 6(b)

For more information, please visit the Congo Basin Forest Partnership (CBFP) and the Central African Regional Program for the Environment (CARPE) on the Web at:
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Introduction

Compared to many other tropical forests, the Congo Basin Forest still is relatively healthy. However, under what appear to be undisturbed canopies, serious degradation is often underway. Large blocks of the forest have already become "silent forests," unable to support people or wildlife dependent on forest resources. Unless the trend of accelerating degradation is reversed, the Congo Basin Forest could face the same destruction as that seen in parts of West Africa and South-East Asia.

Recognizing both the value of conserving the forest, and the dangers posed to it, is not a new phenomenon. For example, the first elephant reserve was created in 1889; the mountain gorilla was protected in 1912; and national parks were created starting in 1925. However, protection of the forests only began in earnest in the 1980s, once industrial logging began moving inland from coastal areas, expanding and deepening the threat to the forests.

Over time, it has become clear that an approach to conservation that focused largely on large, charismatic species such as the elephant and creation of national parks was woefully incomplete. Successful conservation depends on taking a more comprehensive vision of complex ecosystems, which in turn necessitates a regional approach.

This comprehensive regional approach is reflected in more recent conservation and development initiatives. The ECOFAC program, funded by the European Commission began in 1992 and covers six Central African countries. ECOFAC focuses on: conserving biodiversity, especially through protected areas; promoting sustainable use of forest resources to promote development and improved livelihoods without mortgaging the future; and encouraging regional cooperation.

A further initiative, the USAID Central African Regional Program for the Environment (CARPE) is a 20-year regional initiative that began in 1995. The program was created to increase knowledge of Central African forests and biodiversity and build institutional and human resources capacity in the region. During the first phase of CARPE, from 1995 to 2002, key lessons were generated by partners regarding the conditions and practices required to reduce deforestation and biodiversity loss in nine Central African countries.

More important, during this same period the countries of Central Africa were intensifying regional coordination efforts in an effort to ensure biodiversity conservation and sustainable forest management across the Congo Basin. This collaborative spirit became embodied in the 1999 Yaoundé Declaration, signed in Cameroon by the Heads of State of six countries. This historic Declaration—and the associated action plan (*Plan de Convergence*) that followed—created a framework to achieve shared forest conservation goals and endorsed the development of new transboundary and regional conservation efforts.

On September 4, 2002, the United States and South Africa joined 27 public and private partners to launch the Congo Basin Forest Partnership (CBFP) at the World Summit on Sustainable Development in Johannesburg, South Africa. This new partnership was established to lend international support for achieving the stated Yaoundé Declaration goals.

The goal in CBFP is to promote economic development, alleviate poverty, and improve governance and natural resource conservation through support for a network of protected areas and well-managed forestry concessions—and through assistance to communities that depend on the conservation of the outstanding forest and wildlife resources in Cameroon, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, and the Republic of the Congo. The U.S. funded activities under CBFP will focus on achieving these goals in 11 ecologically important landscapes in these six countries. Notably, while CARPE overlaps substantially with the geographical scope of work of CBFP, it does include activities beyond these priority landscapes, such as the Virunga landscape.

The goals and approaches of CARPE and CBFP are mutually reinforcing. The announcement of CBFP coincided with USAID's decision to relocate management of CARPE from Washington, D.C., to the Democratic Republic of the Congo and with a shift from a research-focused program to one of on-the-ground activity implementation. While USAID is not the only U.S. Government agency with programs that support the CBFP, CARPE is the primary mechanism through which the U.S. Government provides support to the CBFP.

The overall goal of the second phase of CARPE is to *help establish sustainable natural resource management practices throughout Central Africa, thereby promoting sustainable economic development and alleviating poverty for the benefit of the people of the region and the global community*. This long-term goal is an important reminder that the world's natural resources cannot be viewed independently of one another.

In support of its overarching goal, CARPE's operational objective for its programs in its second phase (2003–2010) is to reduce the rate of forest degradation and loss of biodiversity through increased local, national, and regional natural resource management capacity. To achieve this objective, CARPE activities focus on *promoting the application of sustainable natural resource management; strengthening natural resource governance institutions, policies, and laws; and institutionalizing natural resource monitoring*. CARPE activities also aim to address several

cross-cutting themes, including monitoring and information sharing, gender-related issues, capacity building, and conflict mitigation at the local level.

CARPE places strong emphasis on the value of partnerships, requiring those that receive funding to work in collaboration with others, including national and local governments, African institutions, universities and research centers, international NGOs, other donors, and U.S. Government institutions. The threats to the Congo Basin are numerous—and only through a well-coordinated and collaborative effort can CBFP's goals be achieved.

The purpose of this report is to highlight the incredible natural and human resources of the Congo Basin, while acknowledging the multi-layered partnerships that have emerged in support of the Central African commitment to protect, conserve, and sustainably develop those resources. This initial report showcases U.S. Government–supported activities in the Congo Basin. We recognize that such work reflects but a portion of all of the important efforts under way in the region, with those of Central African nations themselves being most critical for success. Our hope is that future reports will focus on the combined efforts of all the partners, including the countries of the region, other international donors, and nongovernmental groups operating in the Congo Basin. Through this preliminary assessment of the region's forests, we hope to provide a foundation for periodic and more detailed assessment of the Congo Basin Forest that African institutions can build upon over time.

The Congo Basin Forest

The Extent of the Forest

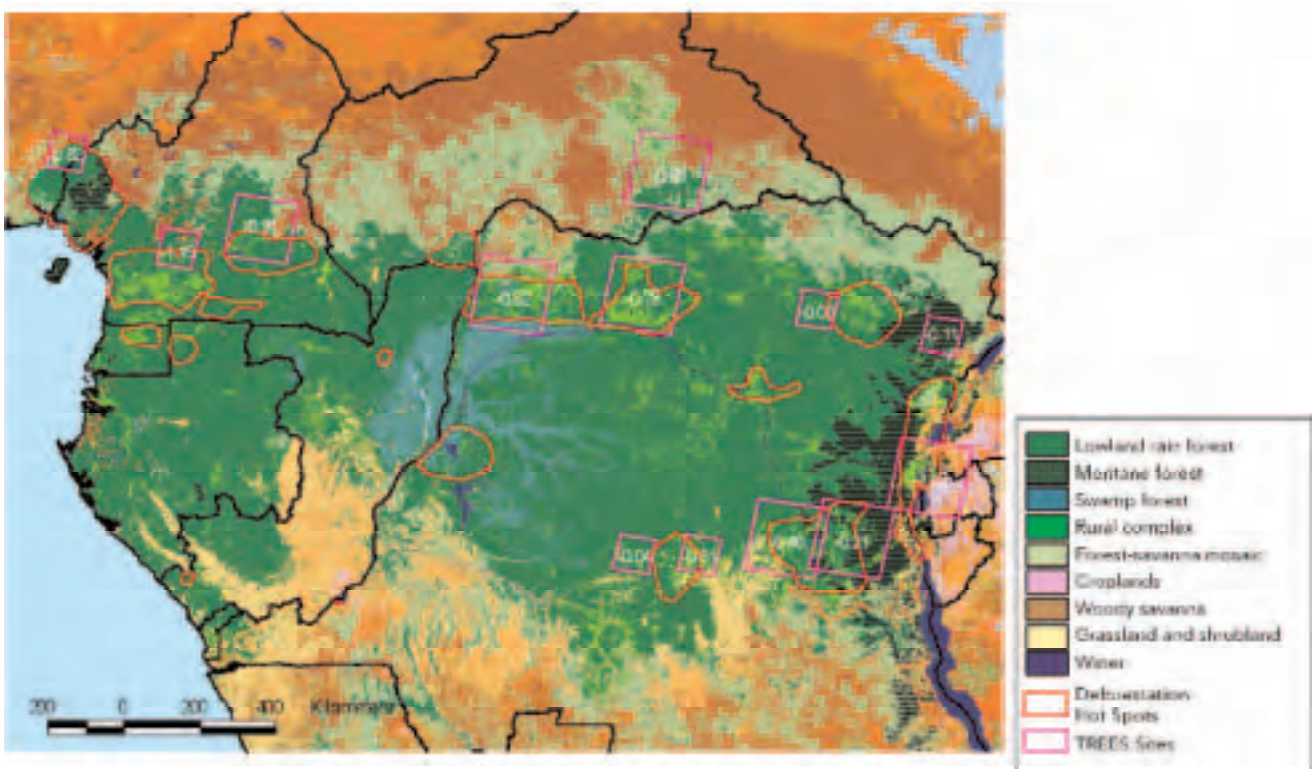
The Congo Basin contains the world's second-largest dense humid tropical forest, surpassed only by the Amazon Basin. Also referred to as the Lower Guineo-Congolian forest, it extends from the coast of the Atlantic Ocean in the west to the mountains of the Albertine Rift in the east and spans the equator by nearly 7 degrees north and south. This assessment focuses on forests relevant to the countries of the Congo Basin Forest Partnership—Cameroon, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, and the Republic of the Congo—and includes an area of approximately 2 million square kilometers. (See Figures 1 and 2.)

Vegetation and Climate

The current distributions of different forest types correlate strongly with annual rainfall and particularly with the length and severity of dry seasons. A unique feature of Central Africa is that the northern forests have a hot, severe dry season, while the rest, particularly the forests of the west, have much cooler dry seasons. The Congo Basin Forest can be divided into six rather distinct ecological regions—called "ecoregions" for short (Figure 3).

Along the Atlantic coast to the west lies a belt of species-rich evergreen forest. This is the wettest forest in the region with annual rainfall in some areas exceeding 3,000 mm. This wet forest extends inland for a distance of

Figure 1. Global Land Cover 2000 Map of Central Africa



This land cover map for 2000 was produced by a network of partners in Europe and Africa under the coordination of the Joint Research Centre (EU). It is derived from various space optical and radar datasets and shows the whole Basin with a level of spatial and thematic detail never before achieved, especially for the swamp forests.

Overlaid on the map are two information layers supplied by the Tropical Ecosystem Environment Observations by Satellites (TREES) project: the first is selected "hotspots" of deforestation as defined by a series of regional experts (red outlines), and the second is the annual deforestation rates (in percentage points) measured within the areas covered by a set of Landsat scenes (purple squares) between 1990 and 1995.

about 200 km, after which the forest becomes progressively drier, flatter, and species-poor toward the interior. The Congo River swamps are found in the center of the forest block supporting significant plant and animal endemism in a vast mosaic of wetlands and riparian vegetation types. At the eastern edge of the Central African forest, the terrain rises toward the mountains of the Albertine Rift.

Plants, Wildlife, and Ecological Services

The biodiversity of Central Africa is of global significance because of both the sheer number of species found in the region, known as *species richness*, and the number of plant and animal species that exist nowhere else on the planet, known as *endemism*. The Congo Basin Forest is one of two remaining regions on Earth that still boast large interconnected tracts of tropical rain forest. The forest harbors the most diverse assemblage of plants and animals in Africa including over 400 mammal species, more than 1,000 bird species, and likely over 10,000 plant species of which some 3,000 are endemic. Only in Central Africa do forest elephant, gorilla, forest buffalo, bongo, and okapi occur in large numbers across large areas of forest.

Humans may have originated in Central Africa, which is home to our three closest relatives—gorillas, chimpanzees, and bonobos. The forest also hosts forest elephants, large ecosystem "engineers" that continuously transform the landscape to maintain the ecological functioning of natural systems. By virtue of its sheer size, the Congo Basin Forest serves as a vast carbon sink of global importance for the regulation of the greenhouse gas, carbon dioxide. The forest also regulates regional and local weather patterns, and ensures the cycling of water critical for a large area of Africa. It provides a critically important

Figure 2. Share of Forest Cover by CBFP Country

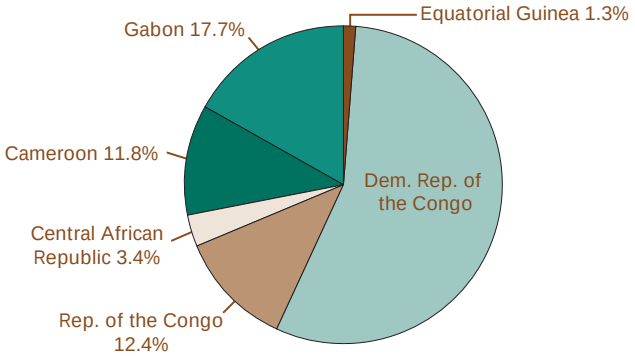
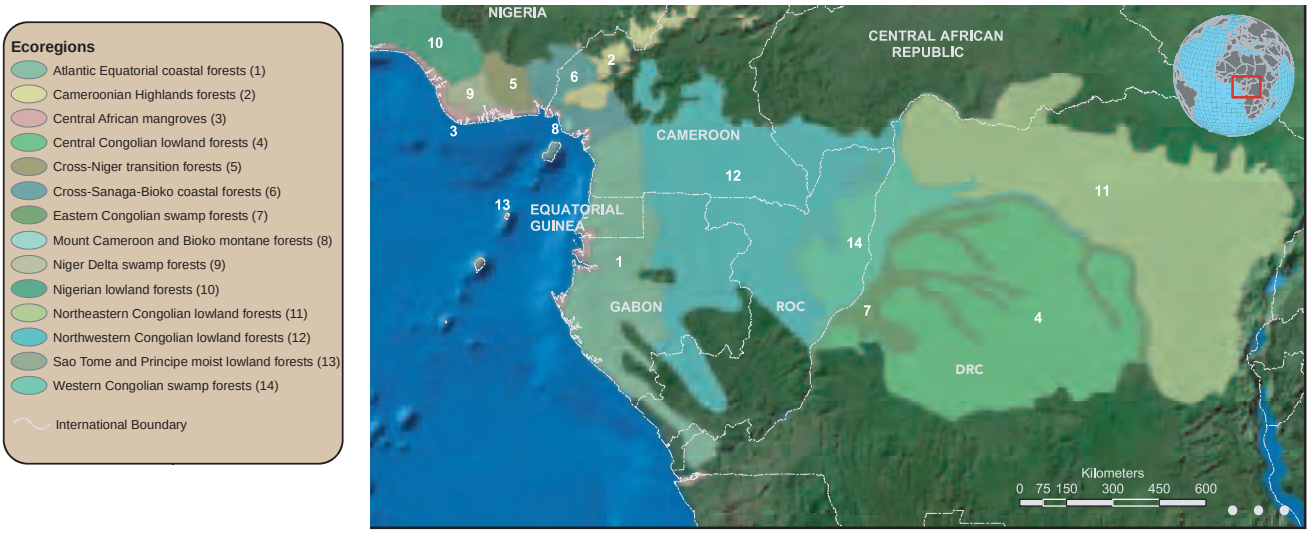


Figure 3. Guineo-Congolese Forest Ecoregions



Atlantic Equatorial Coastal Forests: Western gorilla, elephant, mandrill, other primates; evergreen forest diversity including plants, birds, insects, herps.

Northwestern Congo Lowland Forests: High wildlife densities, western lowland gorilla, elephant, bongo; plant diversity low in the east, higher in the west.

Western Congo Swamp Forests: Wetlands fauna and flora, elephant, western lowland gorilla, chimpanzee, other primates; low plant diversity, some wetlands endemics.

Eastern Congo Swamp Forests: Wetlands fauna and flora, bonobo, other primates; low plant diversity, some wetlands endemics.

Central Congo Lowland Forests: Bonobo, okapi, elephant, salongo monkey, other primates; plant diversity apparently low.

Northeastern Congo Lowland Forests: Grauer's gorilla, okapi, owl-faced monkey, other primates, birds; fairly high plant diversity.

resource base for the livelihoods and well-being of tens of millions of people both in Africa and beyond.

Biogeographical History

During the past two million years the Congo Basin Forest has frequently been reduced and fragmented in response to dry periods. Climate change in equatorial Africa is linked with changes in the upwelling of cold, deep sea water in the Gulf of Guinea. During the last ice age—some 18,000 years ago—rainfall over equatorial Africa was greatly reduced, and most of the present-day forest was actually a forest-savanna mosaic. At the time, the closed canopy forest was mostly limited to refuge areas, especially along the hills of the western coastal portions of the forest and on the far eastern mountains. Today these areas still maintain greater species richness and endemism than other parts of the Basin.

However, climate fluctuations are not limited to ice ages, and the most recent natural destruction of the forest by a significant dry spell was only 2,000–2,500 years ago. Evidence of relatively recent vegetation change is widespread in the region. There is other evidence that in many places vegetation is not in equilibrium with the current climate. For example, the important timber tree, known as Okoumé in Gabon, colonizes grasslands and regenerates poorly in mature forests that prevail. In some areas, for instance, rapid reforestation of savannas is taking place.

Given this natural history combined with rapidly changing and sometimes significant impacts of human activity, the overall picture for the Congo Basin Forest is quite complex. Growth rates of plant and tree species, carbon accumulation, forest structure, biodiversity characteristics, and forest succession are all impacted by both human and natural changes, with significant implications for forest management and biodiversity conservation that are unfortunately only poorly understood.

Humans in the Forest

Modern humans have occupied and used the forest for at least 50,000 years. Evidence of pygmy culture dates back 20,000 years. Today these traditional hunter-gatherers have complex, multi-generational relationships with farmers, exchanging forest products for starch-rich foods and access to manufactured goods.

Agriculture in the forest is a recent development. Bantu agriculturalists migrated into the forest zone from the northwest about 5,000 years ago. Traditionally farming in African forests has involved an extensive rotation of forest clearing, cultivation, abandonment, fallow re-forestation, and subsequent re-clearing. Given the low fertility of African rain forest soils and the low productivity of tropical

forest in general, the traditional lifestyle of both farmers and hunter-gatherers can only exist in ecological stability at low human population density, with harvesting of natural resources geared toward local consumption.

Currently, some 29 million people—more than 150 distinct ethnic groups—live in the Congo Basin Forest. The majority of the people living inside the Central African Forest are indigenous and still rely extensively on the forest for natural resources to complement agriculture. In some areas of DRC, Cameroon, and Gabon, this dependence on the forest has recently increased because of economic challenges, with many unemployed urban people returning to the forest to hunt to support themselves and their families.

The greatest human populations occur along the forest edges, particularly where forests meet savanna. People also tend to concentrate along the larger navigable rivers, including the Congo River, from Kinshasa to Kisangani, and the Ubangi River. These rivers have traditionally served as critical trade and transportation corridors supplying food and moving goods for local populations.

As all rivers running into the Atlantic Ocean are barred by rapids and waterfalls close to their estuary, the interior of the Congo Basin Forest is difficult to access. As a result of these natural barriers significant European influ-

Box 1. Community Control of Resources in the Congo Basin

One of the biggest challenges for natural resource management across the Congo Basin is the reestablishment of resource use systems in which local people have tenure over the land, based on the ethic of self-regulation, to maintain the resource base they need and where un-regulated commercial off-take by outsiders is prevented. In the Sangha Tri-National Landscape, resource managers are working with local people, both indigenous and immigrant, to establish viable tenure systems based on traditional patterns of land use—in which hunting, fishing, and agriculture serve subsistence purposes—and to establish small-scale income diversification. Traditional hunting zones are mapped, hunting and fishing committees set and enforce quotas, and results are monitored in terms of catch per unit effort and remaining wildlife stocks.

Government, conservation NGOs, and the private sector all have a strong role to play in guiding and supporting such initiatives on community lands, which meet local needs and maintain forest ecosystems.

ence in the interior of Central Africa began only in the middle of the 19th century. Since then patterns of human settlement have been largely driven by the development of road networks. The first roads were constructed during colonial rule to facilitate the extraction of natural resources. During this period, populations relocated along major roads, leaving large forest tracts unpopulated.

Today roads continue to influence the pattern of rural complexes, with people establishing villages along roads, leading to "halos" of human encroachment into the forest. In areas with no roads or navigable rivers, large tracts of forest remain intact.

This pattern of human movement, most often driven by outside economic forces, is leading to increasingly localized and often unsustainable extraction of forest resources around these halos. Unfortunately, local people are bearing much of the negative burden associated with this trend.

In addition, industrial-scale land uses (particularly logging and oil palm production), immigration and population growth, nontraditional hunting technology, road development, and increasing access to distant markets have strained the traditional resource management system to a breaking point.

Another major factor affecting people of the Congo Basin Forest is persistent conflict. Most recently, in the eastern Democratic Republic of the Congo fighting has pushed refugees west and has also displaced rural populations away from major roads and into the forest and protected areas where they are less likely to encounter soldiers and armed bands. Such conflict-triggered displacement has significant ecological and social impacts.

Forest Monitoring

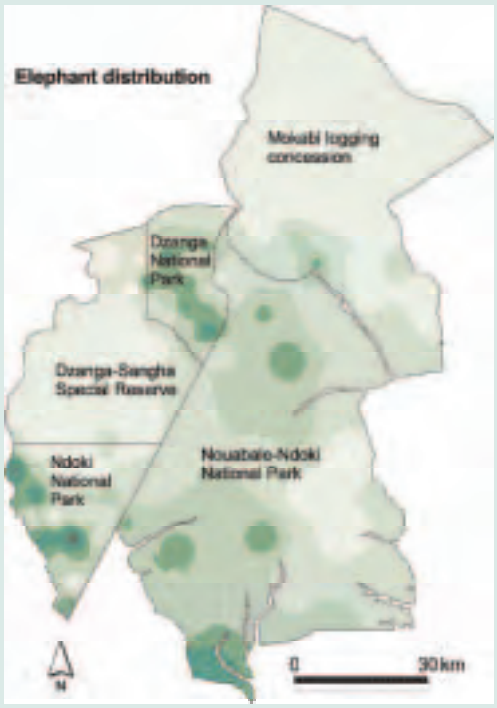
The extent and limited accessibility of the Central African Forest make satellite data the only practical means by which to monitor forest change and map land use patterns. A satellite-derived map of the Congo Basin (see inside front cover) reveals that considerable areas of forest remain

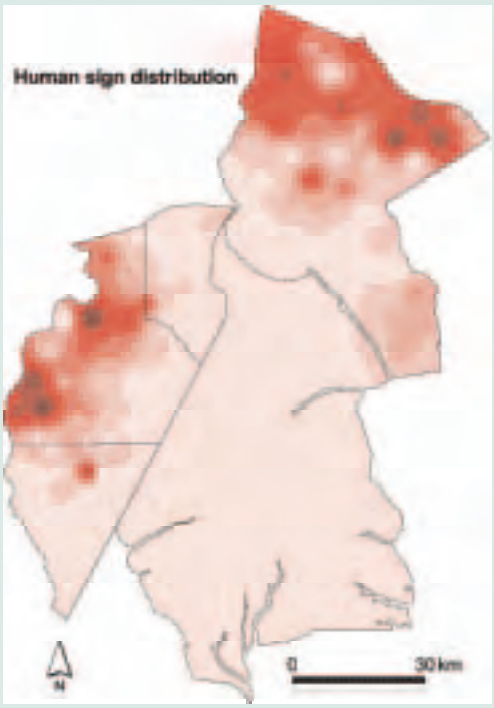
Box 2. Taking a Snapshot of Central African Plant Diversity

With only 34 trained Central African botanists to study, monitor, and protect plant diversity in the Congo Basin, capacity building, training, and communication are critical. The Central African Botanists Network (REBAC) was created during a 1999 CARPE-funded training course for field botanists. REBAC aims to establish, reinforce, and facilitate links among Central African botanists. The network has a coordinator, assisted by six focal points from the six CARPE countries represented. The REBAC mission is to promote knowledge of Central African flora, through capacity building and field inventories, to achieve better conservation of the Central African Forest.

Box 3. Forest Elephants: Population Decline and Range Restriction in Africa's Equatorial Forest

In 2003–2004 a region-wide survey of forest elephant populations was implemented in Central Africa's equatorial forest under the auspices of the Monitoring of the Illegal Killing of Elephants (MIKE) program of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Nine teams of African researchers from five countries were trained over an 18-month period in field research methods, data management, analysis, and reporting. Systematic surveys of elephant conservation status were conducted at six sites, based in and around protected areas, including national parks, which together contained arguably the largest known forest elephant populations remaining on the continent. Human activities overwhelmingly determined the distribution of elephants even within isolated and apparently well-protected national parks. Relative elephant abundance was consistently the mirror image of human sign distribution (see maps below). Forest elephants are being driven into increasingly small and isolated areas, restricting their long-distance ranging—which promotes seed dispersal and physical impacts on the forest essential to the maintenance of diversity. If the trends of illegal killing and range restriction are not halted and reversed, elephants—and the forest they help to maintain—are under imminent threat.





in large tracts. The priority landscapes contain many of these large tracts, which are of considerable conservation value. This map also shows the widespread distribution of rural human settlements composed of mosaics of secondary forest and cultivated areas within the humid forests zone. These rural complexes are expected to expand as the population grows and the economy develops.

Capacity to monitor the status of Central African forests using a combination of Geographic Information Systems (GIS), remote sensing, and satellite imagery and field-based inquiry is limited within the region. Activities are under way to determine a baseline inventory of what exists and to build local capacity (see Box 2). Key needs are comprehensive checklists, collection and collation of existing information in an easily usable form, identification of indicator species for assessing change over time (see Box 3), and a baseline for vegetation monitoring.

Overview of Major Threats and Challenges to Sustainable Natural Resource Management in the Congo Basin

The next decade represents a critical time for conservation and development in Central Africa. Population growth, immigration, and the need to enhance livelihoods for the people of the Congo Basin will undoubtedly put increasing pressure on natural resources. At the same time, efforts to build local capacity, expand effective monitoring, and improve governance will present new opportunities, allowing Central Africans to generate necessary solutions. In many cases the threats to the forests of the Congo Basin are closely tied to critical economic development opportunities in the region. With a sound understanding of threats and the drivers behind them—and more attention to potential ecological impacts, development of mitigation strategies, and compensation schemes—a sustainable future for the forests of the Congo Basin can become more clear.

Overview of Direct Threats

Poaching/bushmeat trade. The over-exploitation of wildlife for commercial purposes—commonly referred to as bushmeat trade—is considered the most imminent threat to forests and biodiversity in Central Africa. The ivory trade has already led to virtual extinction of elephants in many areas. Recent studies under the auspices of CITES indicate that even in the most highly protected circumstances of national parks, elephants are on the decline (Box 3). Current levels of bushmeat trade are both substantial and unsustainable. Trade threatens not only local wildlife, but also the livelihood of traditional forest peoples dependent on wild meat for their subsistence.

Agriculture. Agricultural cultivation, including both commercial and traditional slash-and-burn systems, is expanding in the forests of the Congo Basin. Coupled with increasing human population densities, these practices can often result in complete deforestation. Owing to the low population densities in the forest interior of the Congo Basin, the overall impact is not yet severe. However, certain areas, particularly in DRC, Cameroon, and Equatorial Guinea, are currently under severe localized pressure. These areas include biodiversity hotspots—such as coastal forests and the Albertine Rift and Rift Frontier of eastern DRC—that have high human population densities.

Logging. Commercial logging, both legal and illegal, in the Central African Forest is selective, only harvesting a limited number of high-value timber species. In most areas, however, this exploitation is generally not done in an ecologically sustainable way. Such logging is also generally not socially equitable, in terms of benefits accrued to local communities or national governments. An added impact of commercial logging is that it opens up the forests for hunting and agriculture, tends to bring in large populations of workers and job seekers that place demands on the local resource base, and facilitates unsustainable bushmeat trade by providing access and markets.

Mining. Mining for coltan, a mineral vital to the manufacturing of cellular phones and other electronic devices, continues to draw international attention owing to the severe environmental degradation that results from current practices. Mining for diamonds and gold is also quite common in the Congo Basin, again often resulting in environmental degradation. Digging for diamonds and panning for gold, which takes place in small streams, can destroy these fragile ecosystems. The direct impact is mostly localized, but indirect impacts such as sedimentation, pollution, and poaching can be quite widespread. Diamond mining is the major economic activity in the Central African Republic. Gabon has one of the largest iron ore deposits in the world near Minkebe, but this has so far not been exploited. A lack of best practices, appropriate mitigation, and compensation measures for the mining sector clearly poses a threat to the sustainability of forests and biodiversity in the Congo Basin.

Oil and gas. The oil and gas industry is prominent in the Gulf of Guinea and inland in the coastal forests. The economies of Equatorial Guinea, Gabon, and the Republic of the Congo in particular are closely linked to oil. In the Gamba-Mayumba-Conkouati Landscape the industry is a major player, and there have been substantial adverse impacts on the environment. Besides the real risk of major spills, general pollution remains an issue. Improper

Table 1. Major Threats and Their Potential Impact

Threat	*Cameroon*	*ROC*	*CAR*	*DRC*	*EG*	*Gabon*
Poaching/bushmeat trade	🟥	🟥	🟥	🟥	🟥	🟥
Agriculture	🟥	🟨	🟨	🟧	🟧	🟨
Logging	🟧	🟧	🟧	🟧	🟧	🟧
Mining	🟧	🟨	🟧	🟧	🟨	🟧
Oil/gas	🟨	🟨	🟩	🟩	🟨	🟧
Fishing	🟧	🟧	🟧	🟧	🟧	🟧
Disease	🟨	🟨	🟨	🟨	🟨	🟨
Climate change	🟧	🟧	🟧	🟧	🟧	🟧
Pollution	🟨	🟨	🟨	🟨	🟨	🟨
Urbanization	🟧	🟨	🟨	🟨	🟨	🟨
Displaced people/conflicts	🟩	🟨	🟨	🟧	🟩	🟩
Population growth	🟥	🟨	🟨	🟥	🟧	🟨

🟩 Threat not applicable or very low.

🟨 Low level of threat (not expected to cause irreversible damage within the next 10 years).

🟧 Medium level of threat (expected to cause severe and potentially irreversible damage within the next 10 years).

🟥 Severe threat (expected to cause irreversible damage within the next 10 years).

decommissioning of drilling sites and pipelines, as well as indirect impacts such as poaching resulting from the opening up of new areas of forest, also threaten the region. A lack of ecological and socially acceptable best practices continues to pose a significant challenge to long-term sustainable development.

Fishing. Commercial trawling has been increasing along the coast and in many cases with little regard for local fishing rights and regulations. Access agreements to coastal fisheries are often disadvantageous to the host governments and little capacity exists to control these fisheries. The combination of commercial and artisanal fishing has led to over-harvesting and diminishing returns for local populations. Parts of the Atlantic coast of Central Africa are "invaded" by fishermen from West Africa, with populations sometimes settling inside protected areas and fishing intensively in nurseries and spawning areas. Further inland, fish often represent an important source of protein for local communities. Over-fishing—caused by commercialization, use of destructive techniques, and increased human population pressure—of rivers, lakes, and lagoons is now threatening food security for local people as well as biodiversity.

Disease. Animal health, human health, and biodiversity are intricately linked. The best examples of this linkage are malaria, HIV/AIDS, and Ebola, which are having devastating effects on maintenance of local human capacity to address forest, conservation, and environmental issues. Ebola, besides its effects on humans, is also wiping out apes and other wildlife from huge areas of forest. Insufficient knowledge of the linkages between human and wildlife health, coupled with poor infrastructure to minimize the impacts of epidemics, is a major threat to sustainability in the region.

Pollution. Pollution is not a major issue in the region overall. It tends to be localized and related to urban and industrial activities. However, environmental protection and pollution controls are extremely weak in the region. Thus, as urbanization and industrialization increase, there is considerable risk of growing adverse impacts. Chemical dumping by foreign companies has been raised as an issue of concern.

Indirect Threats

Climate change. Although our knowledge of the effect of climate change on the Congo Basin is limited, evidence from several studies indicates a likely severe impact in the longer term. Many localized endemic species are particularly vulnerable to even minor changes in climate. Increased inter-annual variability and extreme climate events are

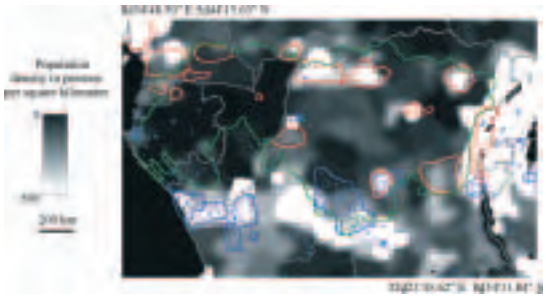
likely to put even more pressure on communities that depend on natural resources for their food security and other needs.

Urbanization. The human population is, relative to other parts of Africa, highly urbanized. Waste disposal, sanitation, and pollution are all major issues—and services in cities have been unable to keep up with the dramatic growth, leading to environmental problems. All of the region's cities have large bushmeat markets. Urbanization has, in some cases, led to an exodus from the interior of the forest, decreasing rural populations and reducing impacts on the forest.

Displaced people and conflicts. Some countries in the region have been plagued by war and civil unrest, resulting in large numbers of refugees and internally displaced people. These individuals have been forced to live off the land and the impact has sometimes been severe. The problem is particularly pronounced in eastern DRC. Conflicts are often linked to access to natural resources. Additionally, natural resources—such as timber, diamonds, gold, coltan, and ivory—have financed conflicts. As resources become more scarce, more intense conflicts are likely to occur if no mitigating action is taken and appropriate governance structures are not put in place.

Population growth. In DRC, the population is expected to double (from 50–60 million to 100–120 million) by 2020. Other countries in the region will experience similar growth rates. The human pressure is expected to be most severe in Cameroon, Equatorial Guinea, and DRC. Human population pressure is a root cause of many of the threats mentioned above, driving demand for natural resource consumption. Immigration from West Africa is also likely to increase, exacerbating demands on the natural resource base.

Figure 4. Population Density and Deforestation Hotspots in Central Africa



This map shows deforestation hotspots—areas of intense deforestation detected by comparing satellite images taken in two different years. The hotspots are colored according to the organization that detected them, with those marked by the University of Maryland (1984–1997) outlined in blue and those determined by the TREES project (1993–2003) shown in red. Deforestation hotspots are superimposed on a map of population density with data provided by the Center for International Earth Science Information Network (CIESIN). The approximate extent of dense humid forest domain is outlined in green.

Corruption and lack of good governance. A lack of good governance undermines progress toward conservation and sustainable natural resource management in the forests of Central Africa. A lack of transparency and good governance procedures for granting logging concessions in many countries is leading to corruption, poor business practices, and a lack of incentives to make the necessary long-term investment required to improve the sustainability of the forestry sector. Poor governance also limits the ability to maximally gather and equitably distribute benefits derived from natural resources among the people of the region.

Lack of institutional capacity. Limited government budgets for conservation have led to insufficient staff numbers, poor training, and low morale at forestry and wildlife departments, leaving them extremely weak. Skills for monitoring the status of biodiversity or forest health and engaging local communities as effective stewards of the natural resource base are also in short supply. In some countries, however, increased national commitments toward conservation are leading to increased donor funding for strengthening wildlife and natural resource management departments, with expanded training and career opportunities emerging. And despite insufficient funds and low capacity, commitment to conservation is high in some areas. In DRC, for example, park guards have continued to do their jobs during the war, often putting themselves directly in harm's way (see Box 4).

Insufficient long-term funding. Conservation is a long-term investment, but the typical short-term planning horizon of major donors leads to boom-and-bust cycles for projects. Many of the protected areas have been either newly created or neglected for many years. To transform these "paper" parks into functioning entities will take significant effort, such as CARPE's 20-year commitment, sustained over decades with substantial financing and capacity building.

Lack of awareness of scale of the problem. The conservation constituency within the Congo Basin needs to be strengthened at all levels. Many people living both in and outside the Congo Basin have a perception that the forest is endless and its resources without limits. Even though there is a high level of political commitment in the region, considerable effort needs to be made to share both the

Box 4. Partnership in Action: A Commitment to Conservation in DRC

During the years of conflict in the Democratic Republic of the Congo, the NGOs and governments that were supporting the Institut congolais pour la conservation de la nature (ICCN), with facilitation from the World Heritage Centre of UNESCO, came together to support DRC's five World Heritage Sites. As the Directorate General of ICCN was cut off from its work force in the field, UNESCO provided funds to park guards through international NGOs still working in the field. This partnership helped secure valuable conservation sites during a time of crisis, and as a result site-based coordination committees (CoCoSi) made up of ICCN park wardens and NGO partners were formed. The new committees continue to undertake planning and joint monitoring of conservation activities in a transparent and collaborative manner. Partnerships sown in wartime continue to reap benefits in times of peace as coordination among funding agencies, NGOs, and international governments continues to improve.

value and the vulnerability of the forests with the general public and local government officials so that they can make more informed decisions about conservation and natural resource use and management.

Lack of capacity of local NGOs and CBOs. Local community-based organizations (CBOs) need to be strengthened and empowered to contribute to sustainable natural resource management. Linkages between traditional decision-making processes at the local village or community level are too often disconnected from decisions made at the national scale, resulting in conflict. People's traditional knowledge, skills, and values—which can be tapped to sustainably manage natural resources—are often ignored as outside influences dictate forest use.

Lack of data, monitoring, and evaluation. A lack of knowledge regarding the status of biodiversity is a major impediment to conservation and sustainable development in the Congo Basin. Landscape management in Africa is a new concept, and the building of an information base is still in its early stages. Increased tools and capacity to undertake systematic monitoring are critical to ensuring that decision makers can have uninterrupted access to critical information for making the best decisions (see box 6).

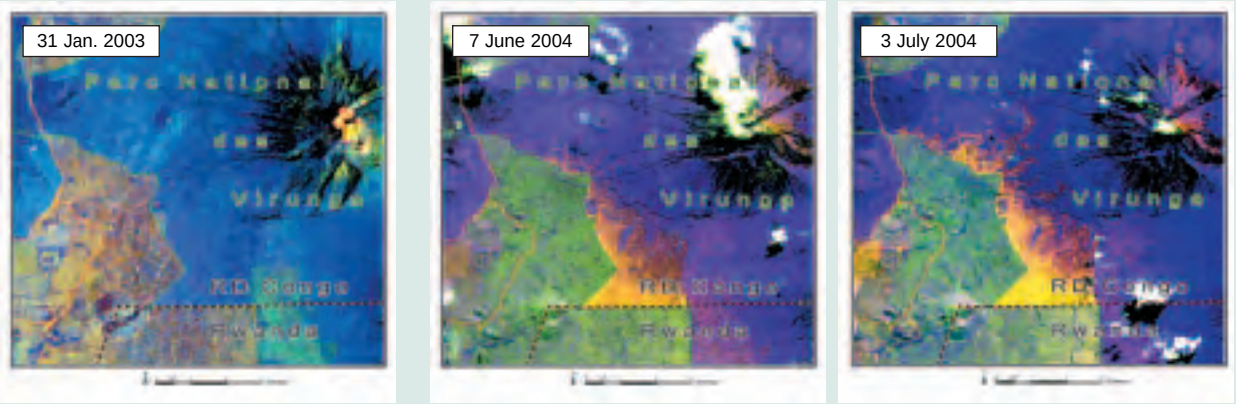
Box 5. ECOFAC: Developing Opportunities and Mitigating Threats

Launched in 1992 by the European Commission as a forest conservation program with a regional approach, ECOFAC (Ecosytèmes forestiers en Afrique centrale) is helping to ensure that several protected areas are properly managed with reliable infrastructure, well-trained staff, and functioning surveillance systems. ECOFAC's successes include the development of patrol-based monitoring, which feeds data collected by patrolling guards directly into a GIS; the creation of new parks and extensions of existing ones based on the program's surveys and inventories; and the biannual meetings of administrators from the countries of the region to discuss common problems and develop conservation strategies.

ECOFAC is also concerned with addressing the needs of local populations living around protected areas and is working to provide alternative sources of revenue as a way to reduce hunting pressure on wildlife populations. A notable outcome of these efforts has been the development of ecotourism opportunities based on great ape viewing, which, in one example, has increased revenues for a village in the buffer zone of Odzala National Park in the Republic of the Congo.

Box 6. Deforestation Crisis in Virunga National Park

Virunga National Park, one of the most prominent World Heritage Sites, lost more than 15 km^2 of forest between May 19 and July 3, 2004. The extent of the deforestation can clearly be seen in yellow in the sequence of satellite images below. Once alerted, ICCN, WWF Albertine rift Ecoregion Programme, and UCL-Geomatics acquired high-resolution imagery to quickly quantify the ongoing deforestation and make these images available to decision makers. More than 7 km^2 of forest had been clear-cut and more than 8 km^2 degraded by about 6,000 people thought to have mainly come from Rwanda. The NGOs supported by the international diplomatic community halted the deforestation process in early July 2004.



Commercial Forestry in the Congo Basin—An Important Development Opportunity

Commercial timber extraction has and will likely continue to significantly influence the management of the forests in the Congo Basin. Nearly 60 percent of an estimated 227 million ha of total forest area is thought to be productive or commercially valuable. As such, commercial forest activity offers an important economic development opportunity for the countries of the Basin.

Forest sector activities currently contribute 3–8 percent of the gross domestic product in Central African nations and as much as 20 percent of employment. Forestry activities are generally second to only the petroleum or mining sectors. A number of indirect employment and income-producing opportunities are also generated in urban and rural areas associated with the forestry sector. These include activities linked to transport, shipping, equipment and services maintenance, small passenger transport, and micro-agricultural and pastoral projects. The sector contributes to the socioeconomic development through the creation and maintenance of roads, as well as localized health care and education facilities associated with forestry concessions.

The State of Forest Management

Over the past decade, the global commercial forest sector increasingly has shifted toward more sophisticated management planning. In the Congo Basin, the forest codes of all six countries now require the elaboration and implementation of forest management plans. While the overall forest area currently exploited under approved plans in Central Africa is small and has involved significant time and investment, improved management capacity of many leading companies indicates a positive shift toward more rational and sound forest use that can be expanded upon.

Recently the rights of local populations to natural resources has begun to receive more attention in the forestry sector. Most forest codes of the region currently include measures aimed at increasing the participation of the local populations in the planning and execution of commercial forest activities as well as in the sharing of benefits that are generated. While more efforts are clearly necessary to achieve social equity within the forestry sector, progress is being made. For example, some forest management plans have acknowledged the use rights of local populations. Forest concessions and forest area tax redistribution schemes have been allocated for the explicit use of local populations.

The progression of a number of companies toward forest certification is a notable milestone toward achieving sustainability in the forests of the Congo Basin, as described in Box 7.

Increased transparency within forest title allocation processes is another major development in the Congo Basin. Traditionally closed-door negotiations are giving way to more open public bidding systems operating under more transparent technical and financial criteria. The shift not only improves transparency and has led to the canceling of less equitable logging permits, but also enables countries to capture a higher portion of forest resource rents through annual area taxes. (See Box 8.)

Industrial Structure and Production Levels

There has been a significant increase in the level of log production in the Central African Forest over the last two decades (Table 2). For 2003, it has been estimated that the overall production of logs in the region totaled between 12.0 and 13.5 million m^3. Gabon is the leading producer of logs with a 2003 annual production of 3.7 million m^3, followed by Cameroon with 2.5 million m^3 and the Republic of the Congo with 1.2 million m^3. Compared with these countries, the Central African Republic, Equatorial Guinea, and the Democratic Republic of the Congo are small producers. While reliable statistics do not exist, illegal logging is known to be a serious problem.

Overall, the commercial forest sector throughout the Congo Basin has traditionally been a log exporter, but in the last few years, many governments in the region have enacted regulations and provided incentives to encourage domestic processing of raw timber. Wood-processing activity, however, has been limited in terms of both volume and sophistication throughout Central Africa.

Box 7. A Move Toward Forest Certification

The Global Forest Watch (GFW) initiative of the World Resources Institute (WRI) is partnering with industry, governments, and civil society in the development of an independent and voluntary forest concession monitoring system (FORCOMS). This novel public-private partnership is seeking to establish a verified information window for leading forest companies in Central Africa to communicate regulatory compliance of their forest operations and progress toward sustainable forest management to the international marketplace, involved governments, and civil society. The partners believe that there will be a positive market reaction to those companies that are making the necessary advances, and that other companies will ultimately seek to make the necessary changes to reap the rewards of legal and sustainable production.

Several important producers are taking the necessary steps to eventually be certified by internationally recognized forest certification schemes. This voluntary movement by certain companies is primarily in response to increasingly sensitive international timber markets. In early 2004 the timber company CIB announced its decision to seek certification under Forest Stewardship Council (FSC) standards, an internationally recognized system. The Wildlife Conservation Society (WCS) has been working with CIB for several years to improve forest management by controlling commercial hunting and poaching. CIB manages what amounts to a 1.3 million ha buffer zone that not only encircles much of Nouabale-Ndoki National Park in northern Republic of the Congo but also links this park to the Lac Télé Community Reserve to the south. Nevertheless, the relatively high cost and delays involved in acquiring the technical capabilities needed to meet the leading certification standards remain a serious constraint to more widespread implementation.

Market Trends and Industry Development Opportunities for Central Africa

All indications are that demand on the international market—the Asian market in particular—for African timber products will continue to increase in the foreseeable future. Central Africa's actual share in the international timber trade is quite small, and international markets should be able to absorb any potential increase in timber production from the region. Central African timber will, however, continue to compete in the specialty products niche rather than in the commodity-type markets where North American and European forest producers dominate. Competition from plantation timber will also continue to increase because numerous large industrial plantations, notably in Asia and Latin America, are now coming to maturity.

On the supply side, expert analysis seems to indicate that formal production in Central Africa will likely decrease over the next couple of years owing to a variety of factors. In all of the countries of the region, with the exception of DRC, most of the productive forests have already been allocated and many have already been harvested or over-harvested to date. Highly competitive illegal logging may very well continue, impoverishing the forests and unfairly competing against formal sector operations. As well, most of the commercial forests that remain are located in the most remote parts of the region. This adds significantly to transport costs associated with logging

Box 8. Democratic Republic of the Congo: Improving the Governance of the Forest Sector

In 1999, as part of an effort to clean up the forestry sector, an Inter-Ministerial Commission recommended the cancellation of all forest agreements that had not been inventoried, or were not currently being exploited. This effort resulted in the canceling of 25 out of 41 million ha of active agreements in 2002. It also imposed a national moratorium on the allocation of new forest area agreements, although 3 million ha were eventually allocated, thus bringing the total of forest area allocated to 19 million ha. In 2005, all of the existing agreements will be reviewed in light of their conversion to forest concessions. This exercise may lead to further cancellation of agreements.

Table 2. Production and Export Levels of Industrial Logs from Central Africa (1,000 m^3)

Industrial logs	*1980*	*1985*	*1990*	*1995*	*2000*
Production of logs	7,904	9,024	10,669	12,740	12,731
Export as logs	2,314	2,392	2,897	3,548	4,688

Table 3. The Central African Forest–Based Industry—Major Subregional Statistics for 2000 (1,000 m^3)

Major products	*Production*	*Export*	*Leading producers*
Industrial logs	12,731	4,688	DRC, Cameroon, Gabon, CAR, ROC
Sawnwood	1,148	777	Cameroon, CAR
Veneer sheets	141	146*	Cameroon, Gabon
Wood-based panels	326	260	Cameroon, Gabon
Plywood	185	114	Cameroon, Gabon, DRC

*Export volume may exceed production when last year's stock is sold in addition to the current year's production.

these areas and limits the profitability for a great number of timber species. Finally, indications are that the implementation of forest management plans will reduce previously unrestrained production in two possible ways—first, by reducing the actual area that can be harvested, and second, by limiting the volumes that can be extracted on a per hectare basis (through an increase in minimum harvesting diameter and the protection of seed trees and a number of endemic tree species).

In the next 10 years, international demand, national pressure and laws, and the need to ensure sufficient financial returns may support significant investments in wood processing that could progressively replace log exports. This could present an important opportunity for the industry to maximize the utilization of the limited forest resources and to improve its financial returns.

Informal wood harvesting for the local market and for firewood and charcoal production in many parts of Central Africa is also very important. The volumes for these activities can largely exceed those associated with industrial production. For example, in Cameroon such harvesting, which in contrast to industrial logging is not limited to a small number of species harvested, is approximately five times that of industrial timber production. While these activities may be critical to the livelihoods of local populations, their sustainability is difficult to assess.

The Concept of Landscapes

From the Mountains of the Moon to the Atlantic Ocean, the Congo Basin is a vast and immensely complex ecological system that has evolved over geological and evolutionary time. Conserving this exemplar of biodiversity is critical to the world's future. A fundamental question then, is how.

As conservation theory and practice mature, compelling scientific evidence has repeatedly shown that fragmentation of natural systems threatens biodiversity. When critical ecosystem functions are disrupted, ecological systems tend toward collapse and a loss of diversity. National parks, as the traditional custodians of biodiversity, bear witness to the failure of small isolated areas to preserve biodiversity, as most are too small to maintain their full complement of species and ecological processes over time. The maintenance of ecosystem function, structure, and viability requires thinking and acting big—large-scale protection of entire ecosystems. Critical species assemblages—biodiversity hotspots, for example—may need particular attention on a fine scale within larger functioning ecosystems.

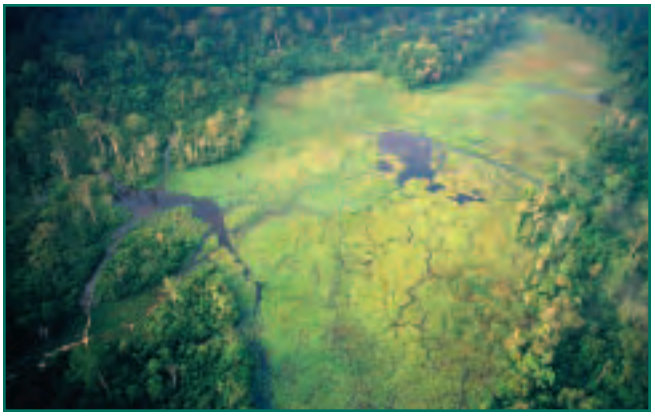
Successful conservation requires social as well as ecological sustainability. Strategies must integrate diverse goals of conservation and human use, including protection, commercial exploitation, local subsistence use, agriculture, industry, and urban development within a complex mosaic of land and resource use. With average annual population growth rates of about 3 percent across the Congo Basin, and some of the richest timber stands and mineral deposits on Earth, Central African nations will need to reconcile ecosystem integrity and human use if the maintenance of biodiversity is to be achieved.

In the Congo Basin, the strategic *Plan de Convergence* adopted by the Conference of Ministers in Charge of Forest in Central Africa (COMIFAC) endorsed and refined the concepts that global- and continental-scale priority setting and landscape-scale implementation offer the greatest chance of conservation success. In 2000 a WWF-sponsored priority-setting workshop in Libreville involving more than 150 national and international specialists concluded that not everywhere in Central Africa could be, or should be, a priority target for conservation.

Urbanization, natural habitat loss, and degradation had left large areas with dysfunctional natural systems, bereft of wildlife and with low biodiversity. Based on goals of representation, population viability, sustainability of ecological processes, and ecosystem integrity and resilience, a suite of large tracts of relatively intact wilderness and other areas of unique ecological importance were identified. These areas in the six countries, covering about 685,500 km^2, or about 36 percent of the Congo Basin Forest, captured, according to expert opinion, the majority of essential terrestrial and aquatic biodiversity and ecosystem functions of the Congo Basin and also provided a framework for management planning and implementation. These areas, embedded in a matrix of variable human use and frequently crossing political boundaries, form the landscape network of CBFP.

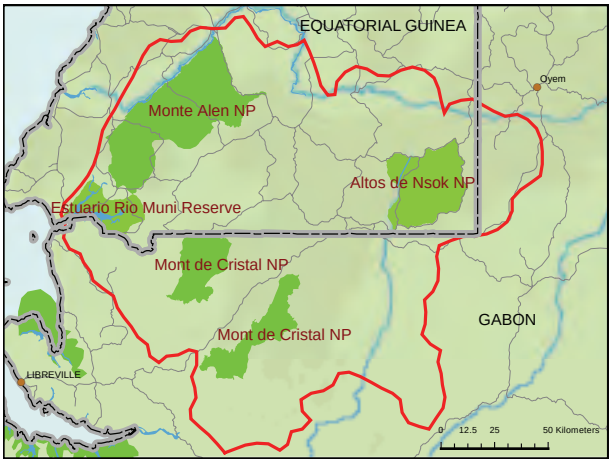
Core areas where biodiversity conservation has precedence over all other land uses are the bedrock of landscape design for conservation. Landscape planning is based on the concept of preserving intact core areas with increasing human use and influence radiating outward. With a mean area of 62,300 km^2 (ranging between 26,700 and 141,100 km^2) the landscapes are of sufficient size to capture the large home and seasonal ranges of focal species such as forest elephants, hornbills, and giant tiger fish, and to maintain viable populations of wide-ranging and rare species. Threats to core areas and landscapes may be systematically identified and addressed. A growing understanding of both the biological and human landscape components, gained through discussion with governments and local people, research, and on-the-ground experience, can help stakeholders develop and negotiate land use plans with areas for both subsistence use and commercial exploitation. Conservation success is fundamentally about building strong human relationships between key players based on mutual respect, trust, and common interest. Within tangible and defined landscapes, all stakeholders can be identified, included, and negotiated with as key designers and implementers of land use management plans oriented around a common sustainable ecological and social future.

The following pages summarize the key features of each CBFP landscape, including biological and social components, threats to biodiversity, and management capacity and interventions.



Monte Alen–Mont de Cristal Inselbergs Forest

The Monte Alen–Mont de Cristal Inselbergs Forest of Gabon and Equatorial Guinea is characterized by sparse human populations, large tracts of intact forest, granite inselbergs, cloud and montane forests, and pleistocene refugia on which forest cover has been contiguous over geological time. These features promote dramatic botanical richness with at least 3,000 species of vascular plants, with 100 endemics. High rainfall and intact watersheds make the landscape an important repository of freshwater biodiversity as well as a valuable source of hydroelectric power. Industrial logging dominates land use and the economy.



Sustainable Resource Management

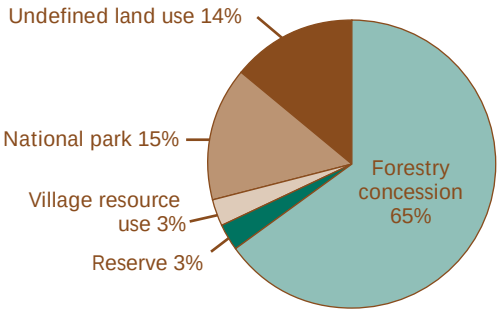
The landscape contains three national parks and one national reserve in a sea of logging concessions. Only one logging concession (Rougier) carries certification and makes serious efforts to control illegal hunting. National park management is at an incipient stage throughout the landscape. In Equatorial Guinea, where local people have traditionally had little involvement in land use planning, there are preliminary management plans for the protected areas—as well as a model plan for the forestry concessions. The plan for Monte Alen is being partially implemented, but no forestry concessions are under best practices management. Laws exist to control wildlife hunting, but they are not enforced. In Gabon, park management is incipient, stakeholder meetings have begun, and park limits have been physically established. Illegal logging in the park has been stopped, and a park antipoaching unit has been established.

Natural Resource Governance

Three national government agencies are responsible for natural resource management in the landscape, two of which are newly created entities. In Equatorial Guinea, INDEFOR has legal jurisdiction over national parks and logging concessions. Created in 2002, INDEFOR has technical ability, but little acceptance or influence within the government, or even within its own ministry, to match its management responsibilities. Having received no operating budget for two years, INDEFOR has not been able to implement existing management plans, establish a management presence in the landscape, or engage with local communities. In Gabon, an inter-ministerial body, the CNPN, was created in 2002 to manage the nation's national parks, while the Ministry of Water and Forests is responsible for management in logging concessions. CNPN will likely receive its first budget allocation from the Government in 2005. CNPN and the hydroelectric company, SEEC, operating in the landscape will sign a collaborative agreement soon to include plans for park headquarters development.

Natural Resource Monitoring Institutionalized

Natural resource monitoring is, like management, incipient, and there is no landscape-scale monitoring or research program. In Gabon, baseline plant, animal, and socioeconomic studies involving national and international institutions began in late 2004. Five permanent 1 ha botanical plots were established for long-term monitoring of forest dynamics. In Equatorial Guinea, capacity is developing with a number of promising collaborations between INDEFOR, the national biodiversity institute (IUBioma), the University of Acalá, Missouri Botanical Garden, Imperial College, and Conservation International. IUBioma and INDEFOR are developing a national research and monitoring plan, within which the landscape will be integrated.



Surface Area: 26,747 km²

Partners: UNGE, INDEFOR, WCS, CI, University of Acalá, Missouri Botanical Garden, Imperial College, CNPN, MINEF, Gabon National Herbarium, Wageningen University, Boston College, Smithsonian Institution

National Parks: 3, covering 3,900 km² (15% of landscape)

Biodiversity (N species)
Plants: > 3,000
Mammals: TBD
Birds: > 340

Threatened Species

Animals
- Forest elephant
- Western gorilla
- Chimpanzee
- Hippopotamus
- Slender-snouted crocodile
- Leopard

Plants
TBD

Major Threats to Landscape

Direct
- Unsustainable hunting
- Unsustainable industrial and community "coupe familiale" logging
- Mineral and gold mining

Indirect
- Weak landscape management institutions
- Urban demand for bushmeat
- Lack of alternative protein/income sources
- Crop damage
- Lack of planning information

Key Interventions

- Threats assessment
- Establishing a national biodiversity institute
- Establishing a conservation monitoring system
- Developing sustainable wildlife and timber management systems in logging concessions
- Developing sustainable community resource use plans

Gamba-Mayumba-Conkouati Landscape

Surface Area: 34,390 km²

Partners: APDN, ASF, Biotopic, CI, CNPN, CRAP, CyberTracker Monitoring Program, Herbier National du Gabon, Ibonga, MINEF, MEFE, Protomac, PSVAP, SCD, Shell, SI, University of Wageningen, WCS, WWF

National Parks: 4, covering 6,700 km² of terrestrial NP and 830 km² of marine NP (20%)

Biodiversity (N species)
Plants: 2,121
Mammals: 89
Birds: 380
Reptiles: 42
Amphibians: 70

Threatened Species

Animals
- Forest elephant
- Western gorilla
- Chimpanzee
- Manatee
- Nile and Slender-snouted crocodile
- Leatherback and *Pelusios marani* turtle

Plants
- *Hyfhaene guineensis*
- *Didelotia pauli-sitai*
- *Combretum ivanii*
- *Xanthocercis rabiensis*

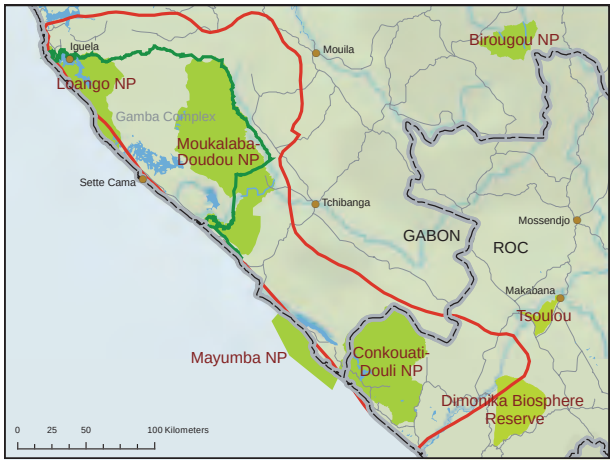
Major Threats to Landscape

Direct
- Illegal hunting
- Unsustainable logging
- Illegal in-shore and offshore fishing
- Oil production
- Gold mining
- Agriculture expansion

Indirect
- Lack of clear management systems for PAs
- Weak capacity
- Lack of alternative protein and work for local people
- Lack of wildlife management in national forestry policy
- Absence of legal structure for NP management authority in Gabon
- Dysfunctional zoning plan in Conkouati-Douli NP

Key Interventions
- Threats assessment
- Zoning and management planning
- Wildlife management in protected areas
- Biological and socioeconomic monitoring
- Development of sustainable funding mechanisms
- Sustainable community resource planning
- Environmental education and capacity building of local NGOs
- Promotion of alternative income-generating activities
- Eco-tourism development

The Gamba-Mayumba-Conkouati Landscape's uniqueness lies in its mosaic of diverse habitats from seashores and mangroves through swamp and rain forest to semi-montane forest, savannas, lagoons, and intact rivers. Conservation began in 1956 with the creation of the first protected areas. Conservation management in Gabon started in 1986 with construction of the Wildlife Brigade in Sette Cama, and in ROC in 1980 with the creation of the Conkouati Wildlife Reserve—a national park since 1999. Four national parks now occupy 20 percent of the landscape. Oil, logging, and fishing dominate land use and the economy. In this land of surfing hippos, turtles, and majestic vistas, tourism is slowly taking off.



Sustainable Resource Management

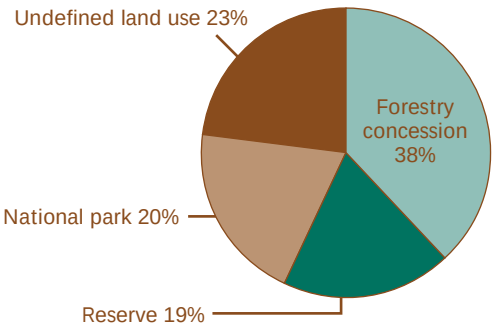
Park infrastructure has been developed in all four national parks, including new headquarters for Mayumba National Park, two additional surveillance posts in Moukalaba-Doudou National Park, and a surveillance post and expansion of the park headquarters at Conkouati-Douli National Park. Innovate collaborative mechanisms for eco-tourism development have started in Loango National Park. A draft management plan for Loango National Park is being revised, and a land use and zoning plan for the Gamba Complex of Protected Areas, covering 35 percent of the landscape, has been proposed to the Government of Gabon. A Technical Management Committee for the Gamba Complex was adopted by the Government in late 2004. In ROC a new management plan is being drafted for the Conkouati-Douli National Park, proposing to simplify the current zoning into a spatially continuous national park, surrounded by a community reserve with well-defined rules on use and access. The spectacular marine park, which provides critical habitat for whales, turtles, and dolphins, is threatened by illegal commercial fishing.

Natural Resource Governance

Collaboration with the oil and gas industry is focusing on hunting management and environmental best practices on-shore, and on oil spill prevention and mitigation of the impact of seismic studies on whales offshore. Sixty-one eco-guards and eco-guides have been trained in Gamba, of whom 20 are currently deployed in three of the four national parks. Illegal logging has stopped in all protected areas on the Gabon side of the landscape. During 43 patrols in the Gamba Complex over the last 10 months, 65 guns, 92 animals, and 496 snares (including 30 elephant snares) were confiscated, and illegal hunting in key areas has been reduced. Nine articles were published in the national newspaper, l'Union, and 1 national TV and 32 local and international radio programs were broadcast. During a high-level meeting in October 2003, the Ministers of State and Forestry Economy and the Environment of Congo publicly demonstrated clear Government support for the Conkouati-Douli National Park and an end to the commercial bushmeat trade from the park. A multi-stakeholder committee tracked implementation of the conclusions of the meeting in consultation with local communities. The Government of ROC and WCS signed an agreement in early 2004 providing for the extension of the marine section of the national park to complement the Mayumba Marine Park in Gabon.

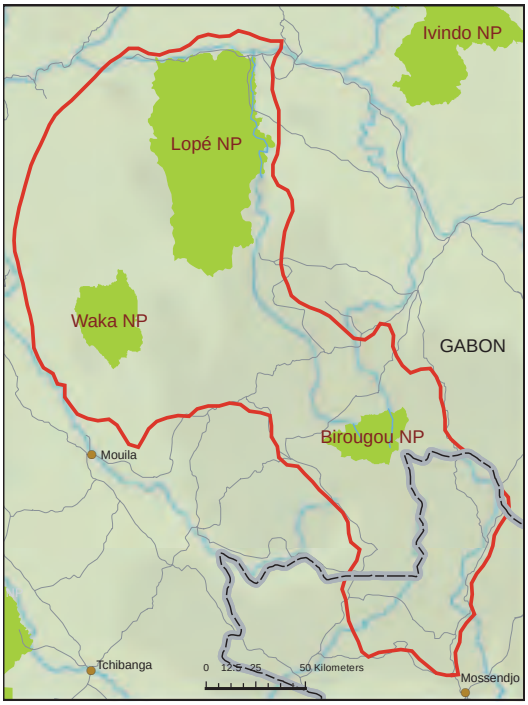
Natural Resource Monitoring Institutionalized

A GIS and data management center in Gamba forms the landscape monitoring hub. A landscape-level threats assessment has been initiated. Ecological research and monitoring programs are in place for elephants, great apes, crocodiles, whales, and marine turtles. Species lists for birds, mammals, reptiles, amphibians, and flora are currently being updated for the Gamba Complex. In October 2004, the first systematic survey on key-species abundance and human impact and distribution was conducted in Conkouati-Douli. Systematic socioeconomic and law enforcement monitoring programs have also been established. Socioeconomic databases are being reviewed, and a community-based natural resource perceptions investigation has been initiated.



Lopé-Chaillu-Louesse Forest Landscape

The Lopé-Chaillu-Louesse Landscape extends from the geographical center of Gabon at Lopé to 50 km into ROC. It contains ancient savannas about 40,000 years old, a highly diverse Pleistocene refuge, the Chaillu Massif with its wealth of endemic plants and animals, and vast Marantaceae forests to the north, which have the highest recorded mammalian biomass of any tropical rain forest. Prior to creation of Lopé, Waka, and Birougou National Parks in August 2002 the entire area was scheduled for logging. Now these three protected areas are of key importance for biodiversity conservation, but numerous, often large villages and logging concessions represent a challenge for natural resource managers. The integration of remaining Ba'bongo pygmy populations, hunter-gatherers who have lived in relative balance with the forest for millennia, is a high priority.



Sustainable Resource Management

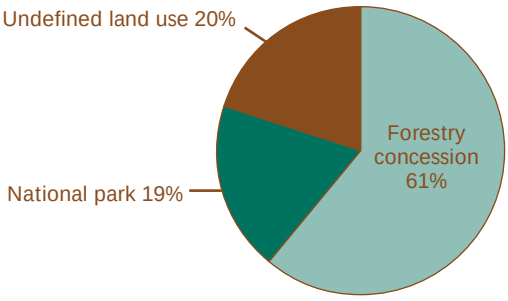
Lopé, Waka, and Birougou National Parks must be managed within the framework of subsistence hunting, industrial logging, and the economic development of Gabon. The limits of Waka and Birougou have been demarcated, as has that of southern Lopé. Consultation meetings have been held with each logging company (NSG, Leroy, IFL, EGG, Bordamur, and SBL) adjacent to the three national parks. Recommendations for the content of an MOU with Bordamur have been made. Plans for temporary closures of logging roads and sites for barriers on active logging roads have been drafted. Negotiations are under way to ensure a smooth transition from industrial logging in the NSG concession near Lopé when the timber company leaves. Reduced-impact logging studies are under way in the SBL concession. Socioeconomic research on subsistence and commercial hunting and on the forest use of the Ba'bongo pygmy are ongoing and will guide sustainable resource management decision making.

Natural Resource Governance

WCS has been participating in regular discussions with CNPN and Ministry of Water and Forests officials over management of protected areas and logging concessions, including the process of defining buffer zones, and controls over resource extraction. No ratified sustainable management plans yet exist for areas outside the parks, and concessions are "managed" for timber extraction only. Similarly, local-level land tenure plans for subsistence use have yet to be developed. All existing environmental NGOs operating in and around the three national parks have been contacted and meetings have been held. An article was published in the national newspaper, l'Union, about World Environment Day activities in Lopé National Park, as well as national radio and TV broadcasts. The Lopé outreach and environmental education team has visited every village in the periphery of the park. Their major focus is on developing sustainable subsistence hunting and fishing practices. Preliminary ground-truthing of village/hunting camp locations and roads around and in Waka and Birougou National Parks has now been completed.

Natural Resource Monitoring Institutionalized

Workplans for socioeconomic and biological surveys have been drafted for both Waka and Birougou; staff have been recruited and trained. A biological monitoring plan for Lopé National Park has been finalized, team members have been recruited and trained, and data collection has begun. Research/monitoring continues in Lopé for buffalo, elephants, leopard, great apes, and mandrills. Lopé National Park Training Center construction is complete, including housing for staff, office space (including a library and computer center), and two dormitories with a capacity for 32 students. A Training Center Director has been hired, courses developed, and the first training sessions have taken place for National School of Water and Forests students, university students, and young Gabonese biological technicians. The MIKE program of CITES held a regional data management and analysis workshop for Central African nationals, the results of which were disseminated at the 13th Conference of the Parties to CITES in Bangkok, Thailand.



Surface Area: 34,859 km²

Partners: CIRMF, CNPN, ECOFAC, ELF, European Union, London Zoological Society, MINEF, Missouri Botanical Garden, WCS

National Parks: 3, covering 6,730 km² (19%)

Biodiversity (N species)
Plants: > 1,500
Mammals: > 84
Birds: > 400
Reptiles: TBD
Amphibians: TBD

Threatened Species

Animals
- Forest elephant
- Western gorilla
- Chimpanzee
- Sun-tailed guenon
- Mandrill

Plants
TBD

Major Threats to Landscape

Direct
- Illegal hunting
- Unsustainable industrial logging

Indirect
- Lack of clear management systems for NPs and reserves
- Weak capacity
- Lack of alternative protein and work for local people
- Lack of wildlife management in national forestry policy
- Absence of legal structure for NP management authority in Gabon

Key Interventions

- Threats assessment
- Zoning and management planning
- Wildlife management systems development and implementation in protected areas
- Setting up of effective monitoring systems and GIS databases
- Environmental education

Dja-Minkébé-Odzala Tri-National (TRIDOM) Landscape

Surface Area: 141,000 km²

Partners: MINEF-Cameroon, MEF-Gabon, MEF-ROC, CNPN-Gabon, WWF, WCS, CIFOR, JGI, GEF/UNPD, EU, ECOFAC, UNF/UNESCO, FIGET, IRET

National Parks: 4, covering 25,300 km² or 18% of the landscape

Biodiversity
Plants: HIGH (TBD)
Mammals: 191
Birds: 520

Threatened Species

Animals
- Forest elephant
- Western gorilla
- Chimpanzee
- Hippopotamus
- Congo clawless otter
- Slender-snouted crocodile
- African softshell turtle
- Nile crocodile
- Lion

Plants
Baillonnella Toxisperma (outside protected areas)

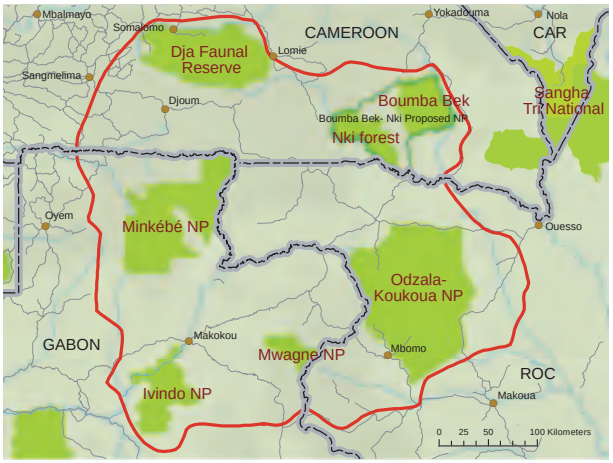
Major Threats to Landscape

Direct
- Logging
- Commercial hunting
- Elephant hunting for ivory and meat
- Unsustainable fishing
- Unsustainable village-based hunting
- Ebola-related ape die-off
- Iron ore mining

Indirect
- Weak government capacity
- No adopted forest zoning plan
- Weak wildlife policy
- Weak support for antipoaching

Key Interventions
- Antipoaching in logging concessions, in parks, and on access rivers
- Wildlife management planning in logging concessions
- Participatory development of new and refined wildlife regulations
- Eco-tourism development
- Development of sustainable funding mechanisms

TRIDOM is a large lowland forest wilderness spanning Cameroon, ROC, and Gabon. It is integral to the conservation of intact large vertebrate assemblages, in particular forest elephants and great apes. TRIDOM has low human population density, and large tracts of wilderness remain. Major threats include commercial hunting, logging, mining, and Ebola, which has dramatically reduced ape populations and is of major concern to human health. Protected areas comprise 25 percent of the landscape, most of which has never been logged. The major management challenges are curbing elephant poaching, managing wildlife in logging concessions, ensuring sustainability of village-based hunting, protecting aquatic systems, and developing sustainable funding mechanisms for the landscape's emerging conservation capacity.



Sustainable Resource Management

Government and landscape partners work closely to address key threats such as elephant poaching and illegal commercial hunting of wildlife in logging concessions. More than half of the landscape is under logging concessions, and it is crucial that these areas remain viable diverse ecosystems. Some companies—such as Rougier in Gabon, Pallisco in Cameroon, and IFO-Danzer in ROC—are actively preparing management plans that include "set-aside" conservation areas and company support for wildlife management. The landscape conservation strategy focuses on strengthening surveillance capacity—for the protected areas and the logging concessions, preparing forest zoning—and refining community-based natural resource management (e.g., village hunting in Cameroon; small-scale gold panning MOU in Minkebe; adopting and implementing wildlife management regulation logging concessions in Cameroon, Gabon, and ROC; and human-elephant conflict mitigation). Eco-tourism is under development in Ivindo National Park. Conservation management infrastructure includes bases in Somalomo, Lomié, Djoum, and Yokadouma (Cameroon); Ouesso and Mbomo (ROC); and Oyem, Makokou, and Ivindo (Gabon). This infrastructure facilitates management and logistical support throughout the landscape.

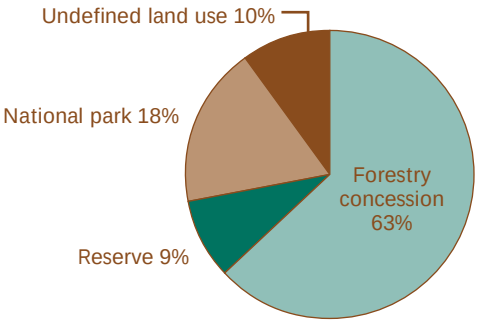
Natural Resource Governance

At the latest extraordinary COMIFAC meeting, a TRIDOM agreement for transboundary cooperation was finalized between ROC, Gabon, and Cameroon. TRIDOM natural resource governance is emerging based on innovative examples that are being replicated in the landscape: WCS' work with the CIB concession is being replicated in IFO-Danzer; WWF's experience in the Bordamur concession is under replication in most of the other medium-sized concessions in northeastern Gabon; and the Minkébé gold-panning agreement can inspire similar contractual arrangements in ROC or elsewhere in Gabon.

Governments, WWF, WCS, and ECOFAC actively participated in and contributed to the development of the TRIDOM UNDP/GEF proposal that will focus resources on sustainable management and conservation of the "inter-zone" of the TRIDOM area. The Government of ROC announced its commitment to form a "parastatal" Wildlife Service with technical support from WCS. However, more policy work is needed to manage hunting—and come up with innovative ways to pay for the cost of necessary surveillance—in logging concessions.

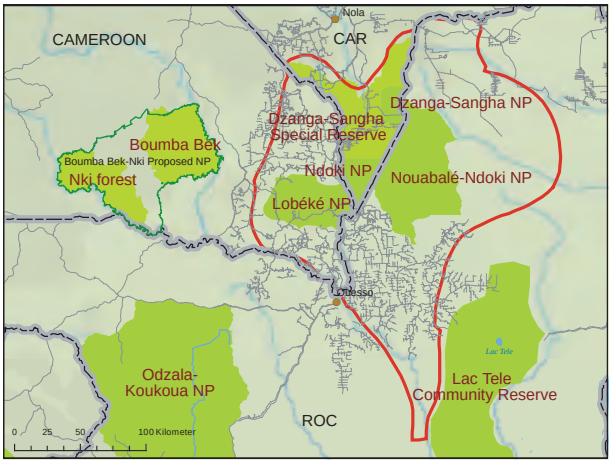
Natural Resource Monitoring Institutionalized

Monitoring in TRIDOM focuses on large mammal distribution and abundance, and socioeconomics, including wildlife use and human-wildlife conflict. Large mammal surveys were completed in Minkébé, Ivindo, Mwagne, Boumba Bek, and Dja, and are expanding into Odzala-Koukoua. Forest elephants have been satellite-tagged in Odzala, Ivindo, and Nki. Wildlife health monitoring focusing on Ebola has been initiated in ROC and Gabon. Socioeconomic surveys have been designed and launched to assess traditional territories, conflict with park borders, and natural resource use practices. GIS capacity is high and field data collection systems such as "CyberTracker" are being employed to streamline data collection, management, and analysis.



Sangha Tri-National (STN) Forest Landscape

The principal conservation value of STN is in its large tracts of intact forest, abundant charismatic mega-fauna, and low human population density (0.7/km^2). Forest covers over 96 percent of the landscape. Conservation actions began in 1984; the area had been classified as production forest up to that point. Three national parks now occupy 21 percent of the landscape—a huge success, for STN is now one of Central Africa's critical forest conservation "massifs." Logging dominates land use and the economy, with 17 concessions covering 71 percent of the landscape. Three companies have technical agreements to work on best forest management practices; two of those, CIB in ROC and Decolvenaere in Cameroon, have opted for FSC certification. The STN international accord is yet to be ratified, although collaborative program implementation on the ground is proceeding well.



Sustainable Resource Management

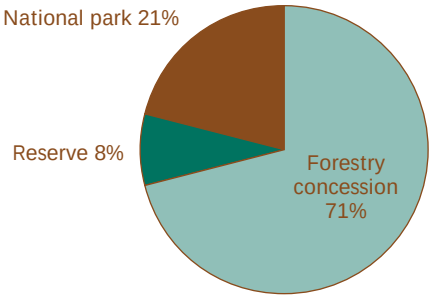
Within STN, some positive collaboration has been developed among Government, NGOs, and major stakeholders—notably, local people regarding resource extraction management, logging companies on sustainable management issues, and safari operators in Cameroon on concession management. MOUs have been signed with logging companies in Cameroon and ROC in support of wildlife management. The Nouabalé-Ndoki National Park management plan is being implemented. Adaptive wildlife management programs are being implemented in three logging concessions, and tangible plans for conservation "set-asides" are under discussion. Eco-tourism development continues, with binational-scale tourism programs, including habituated gorillas, under way in ROC and CAR. Priorities include validation of Lobéké National Park management plan and community-hunting zones, adoption of a management plan of Dzanga-Sangha, and finalization of an STN trust fund to help meet sustainable finance needs.

Natural Resource Governance

Technical and administrative coordination of STN is maintained through regular local and regional meetings. National and binational law enforcement patrols composed of eco-guards and government agents are deployed across all landscape sectors, and illegal human activity has been demonstrably reduced in ROC and CAR. In ROC, the Government has announced its commitment to form a "parastatal" Wildlife Service with technical support from WCS. Local communities and local NGOs have been integrated in natural resource management across the landscape, including community hunting zone development in Cameroon and ROC, while local communities in CAR derive direct benefits from eco-tourism activities. The STN accord, which has been ratified by ROC, provides an institutional framework to coordinate transboundary activities. Immediate priorities include ratification of the accord by Cameroon and CAR, promoting national policies in support of community participation and benefit-sharing initiatives, and improvements in law enforcement, particularly control of illegal elephant and bushmeat hunting.

Natural Resource Monitoring Institutionalized

A common vision for long-term monitoring is shared across STN to promote better knowledge of ecosystem dynamics and help park managers in decision making, based on monitoring of large mammals, logging and hunting impact, law enforcement, and socioeconomic metrics. MIKE-CITES methodology is being implemented widely across the landscape, and common methodologies monitor large mammals in forest clearings as well as ranging of elephants using GPS telemetry. Regular censuses are held across much of the landscape, including complete counts in logging towns and camps. GIS labs are operational in Lobéké and Nouabalé-Ndoki, and regular meetings and training sessions of biologists from the three projects ensure sharing of ideas and a move toward standardization. Important next steps include completion of wildlife surveys and establishment of a GIS database, wildlife inventories, and implementation of wildlife and human impact surveys across the landscape.



Surface Area: 36,236 km^2

Partners: MEFE, MINEF, MEFCPET, WWF, WCS, GTZ, CIB, SBB, Decolvenaere, SEFAC

National Parks: 3, covering 7,600 km^2 (21% of landscape) in 3 countries

Biodiversity (N species)
Plants: 1,071
Mammals: 58
Birds: 302

Threatened Species

Animals
- Forest elephant
- Western gorilla
- Chimpanzee
- Hippopotamus
- Spot-necked otter
- Dwarf crocodile

Plants
- *Autranella congolensis*
- *Pericopsis alata*
- *Diospyros crassiflora*
- *Swartzia fistuloides*
- *Kyaya spp.*
- *Entandrophragma spp.*

Major Threats to Landscape

Direct
- Commercial hunting
- Unsustainable village-based hunting
- Industrial logging
- Diamond mining

Indirect
- Lack of information
- Weak capacity
- Lack of alternative protein and work for local people
- Lack of wildlife management in national forestry policy
- Civil strife and war

Key Interventions

- Threats assessment
- Sustainable community resource planning
- Developing and implementing wildlife management systems in logging concessions
- Managing protected areas effectively
- Developing sustainable funding mechanisms
- Establishing effective monitoring

Leconi-Batéké-Léfini Landscape

Surface Area: 35,138 km²

Partners: CNPN, IGAD, INC, MINEF, Missouri Botanical Garden, PPG, WCS, MINEF-ROC, PPG-ROC

National Parks: 1, covering 2,050 km² or 6% of the landscape; 1 proposed (5,300 km²)

Biodiversity (N species)
Plants: TBD
Mammals: TBD
Birds: TBD
Reptiles: TBD
Amphibians: TBD

Threatened Species

Animals
- Forest elephant
- Western gorilla
- Chimpanzee
- Lion
- Grimm's duiker

Plants
TBD

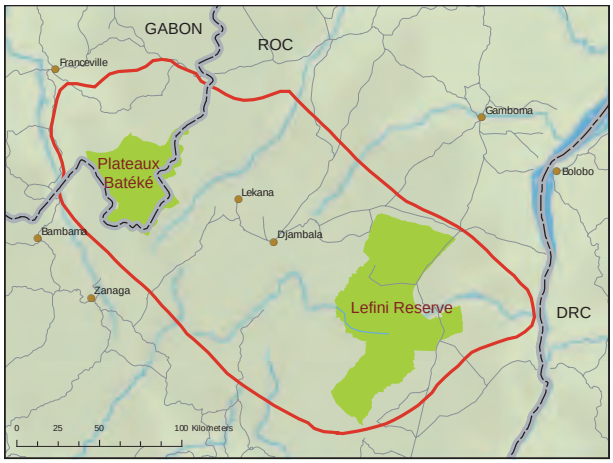
Major Threats to Landscape

Direct
- Illegal hunting and burning
- Unsustainable agriculture

Indirect
- Lack of clear management systems for NPs and reserves
- Weak capacity
- Lack of alternative protein and employment for local people
- Lack of wildlife management in national forestry policy (Gabon)
- Absence of legal structure for NP management authority (Gabon)

Key Interventions
- Baseline surveys for zoning and management planning
- Threats assessment
- Wildlife management systems development and implementation
- Development of sustainable funding mechanisms
- Monitoring systems and GIS databases
- Sustainable community resource planning
- Environmental education and capacity building of local NGOs
- Promotion of alternative income-generating activities
- Eco-tourism planning

This landscape is dominated by an ancient sand dune system—the Kalahari geological formation. The land is covered by large open expanses of grass interspersed with wooded savannas and dense gallery forest hugging river valleys. Despite low productivity on poor soils, which supports low overall biomass, habitat diversity is high, and the landscape supports one of the most important quasi-intact grassland ecosystems remaining in Central Africa. Low human population density and no tradition of pastoralism means that this fragile grassland system has not been degraded through overgrazing. The landscape supported wild dogs until recently, and may still contain a relic population of lions. Bird diversity is outstanding. The Batéké Plateau is an important watershed for growing human populations in ROC and Gabon—and not least, it is an area of remarkable physical beauty.



Sustainable Resource Management

The management of this landscape will focus on a national-park and managed buffer zone approach to landscape planning. A sustainable structure for long-term conservation will be developed through integration of the public and private sectors and local communities.

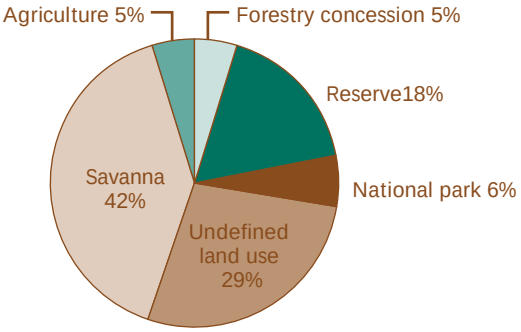
Over the past year ecological and socioeconomic surveys were conducted over 5,300 km² in ROC to assess the potential to create a new protected area: Bambama-Lekana-Zanaga. A lion survey is programmed for early 2005. The 6,300 km² Léfini Reserve, created in 1961, will be assessed in 2005 for potential revision of boundaries and creation of the Léfini National Park. PBNP was officially designated on the Gabonese side in 2002, and management activities began there in earnest in 2004, including close collaboration with an existing gorilla PPG, which manages gorilla sanctuaries in both Gabon and ROC. Transboundary poaching is a problem, and steps have been taken to work with local authorities on both sides of the border to halt the practice.

Natural Resource Governance

Technical and administrative coordination began at the landscape level through a meeting between Gabon and ROC partners in Brazzaville in 2004. A follow-up technical meeting, programmed for February 2005, will focus on developing strategies to address transborder poaching. In ROC, socioeconomic work and meetings with the local administrations have permitted communication and information sharing with landscape stakeholders. Rustic infrastructure has been built in PBNP to date, including PPG headquarters and tent platforms for testing tourism potential. PBNB now has three eco-guards for park surveillance. WCS-Gabon continues to play an active role in CNPN meetings in LBV, and in mentoring the Park Conservator. Antipoaching missions have resulted in arrests of Congolese poachers in Gabon and the seizure of ivory and weapons; unfortunately, suspects have been subsequently released. A tourism management proposal was submitted to stakeholders for comment. Discussions are under way with IGAD for possible collaboration on small-scale rural development projects in villages near the park. Environmental education and village outreach teams are active in both ROC and Gabon, and regular meetings are held with local and regional authorities on both strategy and day-to-day management.

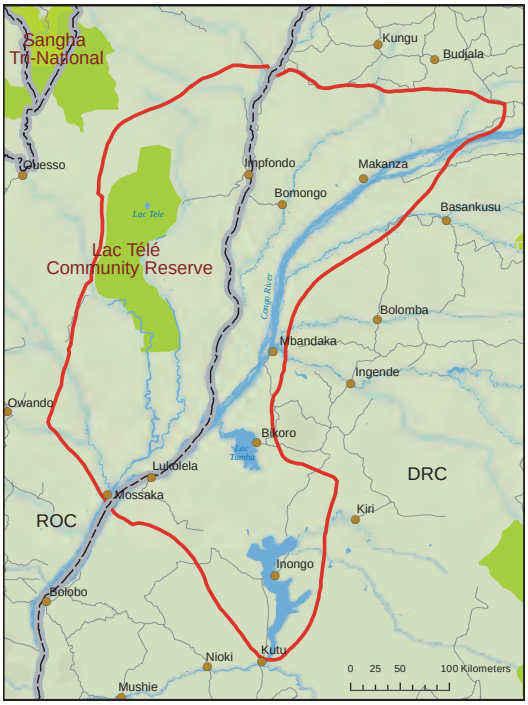
Natural Resource Monitoring Institutionalized

Biological and socioeconomic surveys and mapping of the status of illegal human activities has been undertaken in the PBNP, Gabon, and the Bambama-Zanaga-Lekana area of ROC. Collaboration has been developed on monitoring methodologies with the CNIAF in ROC. In Gabon the Batéké Landscape project has collaborated with PPG-Gabon on ecology monitoring in PBNP and communication with local communities. Likewise, in ROC PPG-ROC is an important partner in developing monitoring for the southern area of the Léfini Reserve and in the Lesio-Louna Gorilla Sanctuary in the Léfini Reserve. WCS is providing technical advice to the MEFE and PPG-ROC to develop management strategies including ecological and socioeconomic monitoring, eco-tourism, and site-based law enforcement. The WCS "Global Carnivore Program" will assist in planning, training, and executing lion surveys in the region, which may contain the last lion population in the rain forest belt of Central Africa.



Lac Télé–Lac Tumba Swamp Forest Landscape

Straddling the Congo River, the LTLT Swamp Forest Landscape contains the most extensive block of swamp and seasonally inundated forest in Africa. Fish biodiversity and endemism is high, yet poorly studied. The Congo River forms an impervious biogeographic barrier separating two of Africa's great apes, and a suite of other species. Lac Télé in ROC holds among the highest densities of western lowland gorillas yet found, while Lac Tumba in DRC is an important area for the conservation of bonobos, man's closest genetic relative. The principal threat to the biodiversity and ecological functions of this landscape is uncontrolled resource use, particularly hunting and fishing.

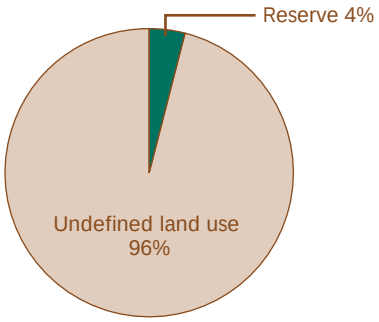


Sustainable Resource Management

To the northwest, the landscape is contiguous with the Sangha Tri-National Landscape. The landscape contains one reserve, LTCR in ROC. Ecological surveys, participatory mapping of traditional community territories, and socioeconomic assessments of resource needs and use are being conducted to guide land-use and wildlife management plans. Community involvement in the planning process and management in order to ensure sustainable resource use is a high priority. A major activity of the LTLT landscape is the development of alternative livelihoods for local communities. Education and awareness raising in the landscape about national laws concerning wildlife and the environment has led to increased support among local communities.

Natural Resource Governance

Natural resource governance is further along in the northern sector of the landscape. In the ROC sector, Lac Télé has been a site of conservation interest for many years, and was already a recognized community reserve when it became part of the landscape. In ROC, trained eco-guards are working with MEFE and the CIB logging company to control hunting and the bushmeat trade along major access corridors. The project leadership is also liaising with local military leaders and politicians to improve security and wildlife protection by reducing the number of automatic weapons entering the reserve. In the south, natural resource management is weak, owing primarily to the short history of natural resource management in the area, but Lac Tumba partners are in the initial stages of improving natural resource management governance by building local constituencies and participatory management structures.



Natural Resource Monitoring Institutionalized

A forest monitoring program, focusing on bonobo and other large mammal populations, is being implemented in the Lac Tumba sector, where local CREF staff has received ecological methods training. Monitoring surveys of large mammals across LTCR were completed in 2004 and indicated that populations of apes and elephants in particular were stable. Capacity building was an important component of this work. Waterbird surveys have continued into their eighth year, indicating that Lac Télé is of international importance for at least three species. Local communities rely on fish for 90 percent of their protein consumption; therefore, understanding fisheries dynamics is vital to sustainable management planning of fish stocks, which will also reduce pressure on other wildlife species. Monitoring fish populations is scheduled to begin across the landscape in 2005.

Surface Area: 126,440 km²

Partners: WCS, WWF, BCI, IRM, CREF

National Parks: 0; 1 community reserve

Biodiversity (N species)
Plants: > 1,100
Mammals: > 60
Birds: > 300

Threatened Species

Animals
- Western lowland gorilla
- Bonobo
- Forest elephant
- Hippopotamus
- Red-tailed monkey
- Red colobus monkey
- Slender-snouted crocodile

Plants
TBD

Major Threats to Landscape

Direct
- Bushmeat hunting
- Over-fishing

Indirect
- Weak natural resource governance
- Military complicity in illegal hunting and fishing
- Lack of alternative protein and work for local people
- Lack of information
- Lack of wildlife management in national forestry policy
- Civil strife and war

Key Interventions

- Threats assessment
- Biological and ecological surveys
- Community wildlife management
- Collaborating with the military to reduce illegal hunting and improve security
- Law enforcement
- Bonobo habituation program
- Sustainable community resource planning
- Developing alternative livelihoods
- Establishing effective monitoring

Salonga-Lukenie-Sankuru Landscape

Surface Area: 102,847 km²

Partners: ICCN, WWF, WCS, ZSM, MPI, LWRP, UMD

National Parks: 1 (2 sectors), covering an estimated 36,560 km² (36% of landscape)

Biodiversity (N species)
TBD

Mammals: 53 (est.)
Birds: > 101
Plants: TBD

Threatened Species

Animals

- Forest elephant
- Bonobo
- Congo peacock
- Bongo

Plants

TBD

Major Threats to Landscape

Direct

- Commercial hunting
- Settlement and resource use in the national park
- Heavily armed poachers and national lawlessness

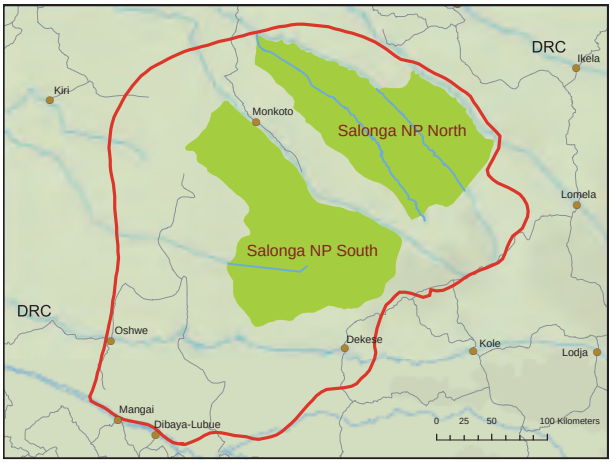
Indirect

- Lack of information
- Weak capacity
- Exclusion of local communities in decision making and management
- Lack of alternative protein and work for local people
- Civil strife and war

Key Interventions

- Initiating land use planning through socioeconomic and resource use studies
- Reinforcing ICCN capacity
- Including local communities in decision making and management
- Establishing site-based GIS database with links to national databases
- Reinforcing park management structures
- Lobbying provincial and national entities to stop armed, uniformed poachers

The focal point of the Salonga-Lukenie-Sankuru Landscape is Salonga National Park, established in 1970 and classified as a World Heritage Site in 1984. It is best known as the only national protected area in DRC sheltering the endemic bonobo, as well as being the second-largest tropical forest park in the world. Dominant forest types are swamp, riverine, and *terra firma* forests with some savanna in the south. Despite limited accessibility (by rivers and air only), recent surveys under the auspices of the MIKE program reveal that the fauna of the park is threatened by heavy illegal hunting pressure—the result of years of unchecked commercial hunting and insufficient management capacity. Other landscape-level resource use includes logging, mining, fishing, and subsistence agriculture.



Sustainable Resource Management

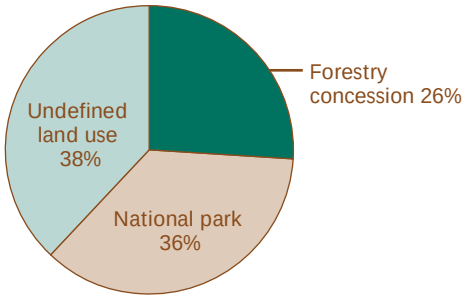
As a first step in the development of land use plans, socioeconomic studies are being conducted in villages bordering the national park. These studies will be extended geographically and integrated with more participatory approaches to assess land use, resolve park boundary conflicts, and complete an assessment of threats to and opportunities for conservation. Plans for baseline studies of fishing by local populations are under way. Management capacity in the landscape is low, and ICCN requires technical training, restructuring, strategic planning of activities, and improved infrastructure, transport, and communication systems. A park advisor will be responsible for ensuring a coordinated approach to capacity and planning exercises for the park's antipoaching and surveillance forces. A base map is being finalized for the national park and a landscape-level base map will be completed in early 2005.

Natural Resource Governance

Six ICCN management posts distributed widely across the landscape are responsible for park management. However, these posts are largely dysfunctional because of limited budgets, poor training, poor staff management and support, and bad infrastructure. Since the creation of the park, local populations have been excluded from management decisions. Their exclusion, combined with limited ICCN capacity, civil war, and centralized yet inefficient government structures, has contributed to the anarchistic use of natural resources in the landscape. A first step in developing management and decision-making capacity will be to create a management structure—called CoCoSi—for the national park, comprising ICCN and partner organizations. Community and private sector (logging and mining) representatives in the CoCoSi will be encouraged, and the possibility of community-based natural resource management committees, ideally using existing civil structures, will be discussed with local communities. Mandates for engagement with communities will be clarified with ICCN. Parallel natural resource sector initiatives such as the creation of community-managed forests will encourage community involvement in landscape-level activities.

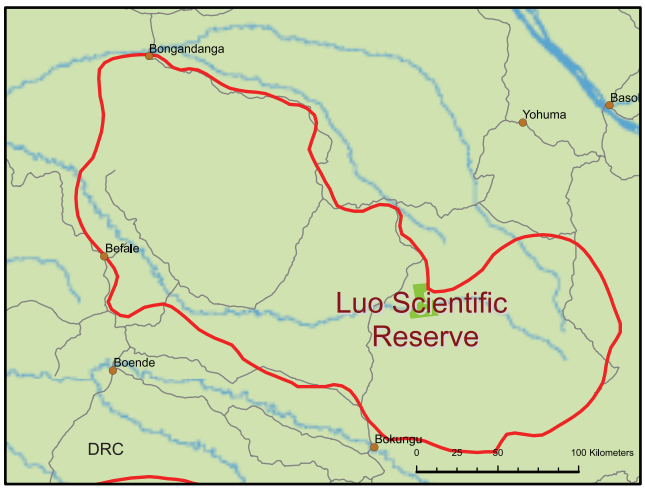
Natural Resource Monitoring Institutionalized

Recently completed MIKE surveys have provided important baseline information as well as capacity necessary for future monitoring of park wildlife—in particular forest elephants, human use, and illegal activities within the park. Several research institutions are studying the ecology, distribution, and behavior of bonobos. A national-level GIS database for World Heritage Sites exists and has produced a preliminary park and buffer zone base map. This database will be directly linked to the development of similar capacity at the field level. A critical activity will be to develop the means to assess and monitor bushmeat exploitation, transport, and commerce, possibly through collaboration with neighboring landscapes (Lac Tumba and Maringa-Lopori-Wamba).



Maringa-Lopori-Wamba Landscape

The Maringa-Lopori-Wamba Landscape encompasses 4.2 million ha of lowland rain and swamp forest in the Equateur province of DRC. It falls within the districts of l'Equateur, Mongala, and Tshuapa. The ecological significance of the landscape is high, not only because it is covered by a globally significant area of rain forest, but also because it is home to the highly endangered bonobo, a member of the great ape family, and other species endemic to the central basin of DRC. Many other important wildlife species are extant as well, such as sitatunga, forest elephant, Congo peacock, more than 10 species of rare primates, amphibians and reptiles. The landscape has an extremely diverse avifauna life.



The biodiversity value of this landscape continues to be high despite the negative impacts of forest conversion, slash-and-burn agriculture, commercial and illegal logging, and the bushmeat trade. These impacts are the result of the ongoing political crisis, military occupation during the war in DRC, and steadily increasing poverty.

Sustainable Resource Management

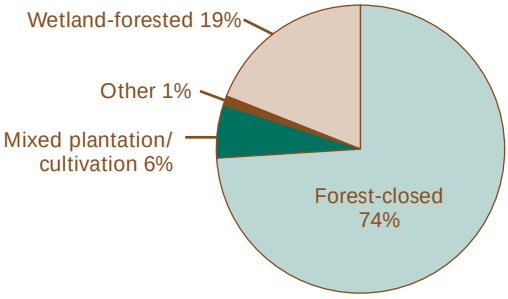
Most of the Maringa-Lopori-Wamba Landscape has been divided up for logging and agricultural concessions. In an unprecedented move, landscape-scale operational and conservation planning has been initiated with broad stakeholder participation. In October 2004, extensive biological and socioeconomic surveys were conducted with a large number of local and international NGOs. Data from this inventory of biophysical, socioeconomics, and infrastructure status is being used for the first landscape management plan that includes land use zoning for pioneering community forest management areas, enterprises, agriculture, and sustainable logging.

Natural Resource Governance

Capacity support for forest management mandates is a critical aspect of the conservation program being implemented in the Maringa-Lopori-Wamba Landscape. In collaboration with the Ministry of Environment and the World Bank–funded Forest Zoning Project, a conceptual framework for strengthening civil society to improve forest governance in DRC is under way. Preliminary assessments and stakeholder consultations are complete and a civil society specialist will be hired. Pilot sites selected in the landscape will provide a model for expanding the scope and scale of forest governance and institutional support work. As the landscape has only one small protected area (the 628 km^2 Luo scientific reserve), there are exceptional opportunities for introducing community-managed forest reserves to reduce destructive consequences of unmanaged, unsustainable use of forest resources.

Natural Resource Monitoring Institutionalized

The landscape's information system is being designed and will include community ranger–based monitoring, a socioeconomic survey, law enforcement, forest watch, and remote sensing/change detection. A landscape information officer has been hired and is working with local monitoring agencies and landscape partners. The results of the comprehensive meso- and macro-scale socioeconomic and biological surveys are forming the baseline for the monitoring network. Extensive trainings have been conducted with local stakeholders for their effective participation in the ongoing monitoring program.



Surface Area: 42,737 km^2

Partners: AWF, CARE-RDC, CI, ICCN, WCBR, WCS, CIDA, BCI, GCF, UMD

National Parks: 0; protected area proposed

Biodiversity (N species)

Plants: TBD
Mammals: TBD
Birds: > 400

Threatened Species

Animals
- Bonobo
- Congo peacock
- Forest elephant

Plants
Diospyros crassiflora

Major Threats to Landscape

Direct
- Bushmeat trade
- Over-fishing
- Logging

Indirect
- Civil strife and war
- Weak capacity
- Lack of alternative protein and work for local people
- Weak and poor policy

Key Interventions

- Landscape-scale plan
- Community forestry
- Institutional support
- Policy support
- Advocacy
- Data-based management

Maiko-Lutunguru Tayna-Kahuzi-Biega Forest Landscape

Surface Area: 71,745 km²

Partners: ICCN, UGADEC, DFGFI, CI, WCS, WWF, JGI, GTZ, UMD

National Parks: 2, covering 16,830 km² (23% of the landscape)

Biodiversity (N species)
Plants: TBD
Mammals: TBD
Birds: TBD

Threatened Species

Animals (17) include:
- Forest elephant
- Grauer's gorilla
- Chimpanzee
- Okapi

Birds (16) include:
- Congo peacock
- African green broadbill
- Grauer's rush warbler
- Chapin's flycatcher
- Shelley's crimson-wing
- Dwarf honeyguide
- Kivu ground thrush
- Sassi's olive greenbul
- Oberlander's/Forest ground thrush

Major Threats to Landscape

Direct
- Unsustainable hunting
- Migration
- Land clearing for agriculture
- Artisanal mining
- Timber extraction

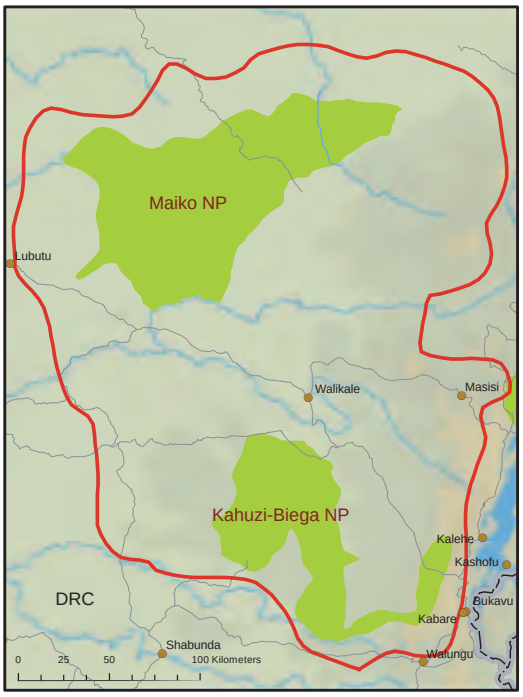
Indirect
- Civil conflict
- Extreme poverty
- Low institutional capacity
- Population growth
- Low resource management capacity

Key Interventions

- Capacity building of local associations and park management staff
- Biodiversity and needs assessments
- Developing PA and community area management plans
- Developing alternative sustainable income opportunities
- Developing sustainable funding mechanisms
- Establishing effective monitoring

The Maiko-Lutunguru Tayna-Kahuzi-Biega Landscape is located in the far east of DRC. The landscape is mountainous and largely covered in dense, mostly intact, rain forest. One of the most remote intact forest blocks in the northeastern Congo Basin, it supports a unique combination of high-profile species, including okapi, Congo peacock, chimpanzee, and the majority of the range of Grauer's gorilla.

A long-running civil war has taken its toll on this ethnically diverse and biodiversity-rich landscape. Civil unrest and in-migration from the densely populated east (~300 people/km²) directly threaten biodiversity through agricultural expansion, artisanal mining, and the bushmeat trade. With stabilization and unification of this region, new threats are emerging in the form of commercial logging, infrastructure development, and increased trade in natural resource products. These threats are compounded by limited livelihood opportunities, general poverty, and low natural resource management capacity within the region.



Sustainable Resource Management

A key objective of the management strategy is to increase management capacity within the national parks and create community conservation areas to form a corridor between the parks. Large areas of the landscape are under no formal land use designation and present an opportunity to develop a land use plan that incorporates both sustainable development and conservation goals.

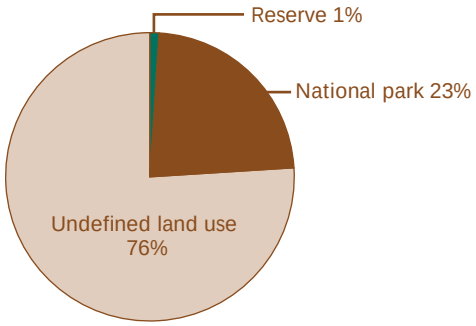
Efforts in the first year of the landscape program have focused on building the capacity of ICCN and local community organizations to manage areas for conservation. CARPE partners have equipped and trained guards, built guard posts, and trained local staff on basic conservation and monitoring techniques. Together with local stakeholders, the partners have developed interim management plans for the national parks and proposed community conservation areas. Next steps include further monitoring and enforcement training, identification and demarcation of community conservation areas, and refining of management plans throughout the landscape

Natural Resource Governance

The long-term sustainability of conservation efforts requires a local population that understands and benefits from conservation efforts, policies that support development and conservation objectives, and institutions and staff that have the capacity to implement these policies. First-year activities have focused on a review of existing policies and laws governing natural resource use, along with the development of a local conservation training center (TCCB) to build a constituency of conservationists within the region. In the coming year CARPE partners will work with local and national government authorities to clarify and implement laws shaping community reserve creation and natural resource management. The partners will build capacity of community organizations to engage in conservation advocacy and broaden planning efforts to involve development organizations more effectively.

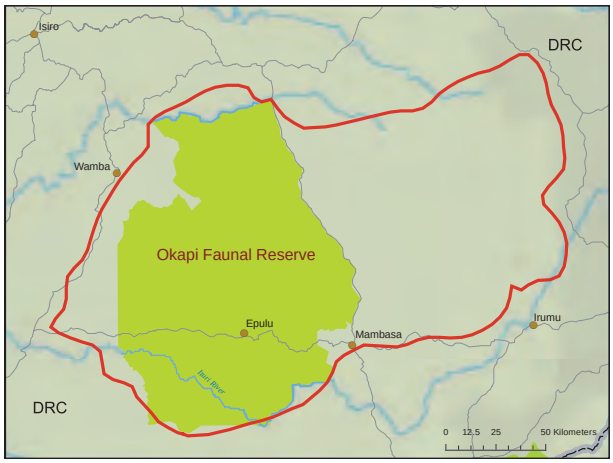
Natural Resource Monitoring Institutionalized

In the first year CARPE partners began training ICCN and local community organizations in biodiversity and threat monitoring and have been building monitoring into management plans for areas throughout the landscape. First-year activities have also focused on the collection of baseline information on the ground through satellite imagery and overflights. Second-year efforts will focus on standardizing collection of data and building a landscape database that can serve as a basis of adaptive management throughout the landscape. Efforts will continue to publish and disseminate all information relevant to the sustainable management of natural resources throughout the landscape.



Ituri-Epulu-Aru Landscape

The Ituri-Epulu-Aru Landscape is one of Central Africa's most biologically diverse regions, containing an exceptionally rich bird and mammal fauna, including major populations of the endemic okapi. The Ituri River watershed contains a largely undocumented and lightly exploited fish fauna. The Ituri Forest is a globally important reservoir of floristic diversity, with a significant flora restricted to a chain of spectacular granite inselbergs that span the forest-savanna boundary. About 30,000 nomadic hunting-and-gathering Mbuti and Efe pygmies live in the landscape. They have long shared the forest with shifting cultivators. More recently, immigrants from the conflict-torn Albertine Rift and savannas that border the Ituri to the east and north have settled here. These pioneers have led the expansion of commercial-scale agriculture, mining, and forestry into the landscape. During the recent civil war, militias occupied the Ituri Forest and fought for access to the landscape's ivory, bushmeat, minerals, and wood. Recovery from the conflict has been initiated; however, the institutional/legal framework for protection and management remains weak at both local and national scale.

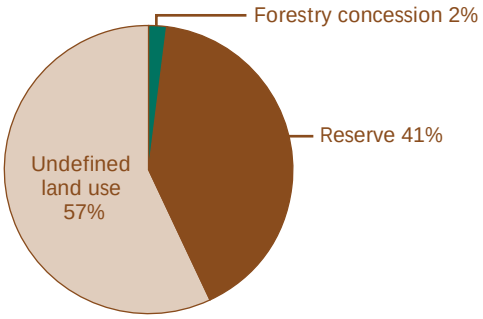


Sustainable Resource Management and Natural Resource Governance

A capture station for okapi was established at Epulu in the 1950s. The okapi reserve (RFO) was established in 1992, covering nearly 41 percent of the landscape, with a mandate to ensure biodiversity conservation in conjunction with sustainable use of forest resources by local communities. Managed land use was initiated in the RFO in 2000 with the establishment of agricultural zones in collaboration with local communities and ICCN. Management of subsistence hunting was initiated in the Epulu sector of the RFO with the participation of Mbuti hunters in 2004. Control of immigration into the landscape and land use practices to protect important biodiversity in areas not included in the RFO are a priority. CBFP partners will work beyond current landscape limits to the south in an important ecological transition zone.

Natural Resource Monitoring Institutionalized

In the RFO, law enforcement monitoring is mandated to ICCN. Community participation in monitoring agricultural and hunting zones in the reserve is organized through CEFRECOF. Since 1994, CEFRECOF, WCS, and the Smithsonian Institution have been monitoring 30,000 trees in four Forest Dynamics Plots in the Ituri Forest. These plots can be directly compared to a network of standardized large plots in 13 other tropical countries. The Ituri plots indicate that distinctive forest stands that are dominated by a single canopy are equally biologically diverse to adjacent mixed-species forests. The Forest Dynamics Plots have been used as a platform for basic ecological research, forest management experimentation, and training of many Central African botanists. Outside the RFO, monitoring of artisanal forestry was initiated through CEFRECOF in 2002. RFO is a site of the MIKE program, and one elephants survey has been completed to date. A second systematic, site-wide survey of elephants, apes, and human impact is in progress.



Surface Area: 33,188 km²

Partners: ICCN, WCS, GIC, SI

National Parks: 0; protected areas: 1 (13,700 km² or 41% of landscape)

Biodiversity

Plants: 121 plant families containing 1,192 species
Large mammals: 62 (forest)
Birds: 312 (forest)

Threatened Species

Animals
- Forest elephant
- Okapi
- Owl-faced monkey
- Fishing genet
- White-bellied duiker
- Golden-naped weaver

Plants
- *Encephalartos ituriensis*
- *Encephalartos septentrionalis*
- *Euphorbia bwambensis*
- *Euphorbia venenifica*
- *Euphorbia teke*

Human Occupation
- Hunter-gatherers
- Traditional forest gardeners
- Recent immigrants

Major Threats to Landscape

Direct
- Immigration and settlement
- Unsustainable hunting
- Artisanal mining
- Artisanal forestry
- Military occupation

Indirect
- Lack of legal mandate for zoning
- Weak enforcement capacity
- Weak land tenure
- Civil strife and insecurity

Key Interventions

- Landscape base map and site database
- Post-conflict baseline inventory
- Land use zoning in the RFO
- Development of monitoring programs
- Construction of patrol posts in the RFO
- RFO-community information and education network

Virunga Landscape

Surface Area: Landscape to be defined

Partners: ICCN, ORTPN, UWA, local NGOs/CBOs, AWF, IGCP, WWF, WCS, DFGFI, DFGFE, FZS

National Parks: 1, Virunga National Park in DRC (8,000 km^2)

Biodiversity (Estimates)
Plants: 2,077
Mammals: 196
Birds: 706
Reptiles: 134
Amphibians: 84

Threatened Species

Animals
- Mountain gorilla
- Chimpanzee
- Elephant
- Golden monkey
- Rwenzori tauraco
- Grauer's rush warbler
- Lappet-faced vulture
- Crowned eagle

Plants
- Bamboo (*Arundinaria alpina*)
- *Prunus africana*
- Mahoganies

Major Threats

Direct
- Habitat conversion
- Bushmeat hunting
- Over-fishing
- Charcoal burning
- Timber harvesting

Indirect
- Weak capacity
- Lack of alternative employment
- Poor law enforcement
- Civil strife and war

Key Interventions
- Institutional support
- Policy support
- Cross-sectoral coordination
- Advocacy
- Data-based management
- Sustainable resource planning

Located within the Albertine Rift, but as yet not clearly defined, this landscape is focused around the Virunga National Park of DRC, a World Heritage Site. It is the most species-rich landscape in Africa for vertebrates and is one of most important areas for biodiversity conservation on Earth owing to extraordinarily high levels of endemism. The landscape covers an array of biotopes—dense humid/afro-montane forests, savannas, freshwater lakes, and active volcanoes.

In 1925, Virunga National Park became Africa's first protected area. The vast landscape is home to the last 700 endangered mountain gorillas.
Subsistence agriculture dominates local economic land use. The fertile volcanic soils support the highest human population density in Africa at up to 700 people/km^2 resulting in huge pressures to convert natural habitat to farmland, over-fishing, illegal cattle grazing, and bushmeat hunting.

Over the past decade civil wars in DRC and the genocide in Rwanda have turned national parks into the frontline for war and hiding grounds for militia and refugees, causing massive human displacements resulting in enormous pressure on forests, wildlife, and park authorities.

Sustainable Resource Management

NGO partners, the European Union, and the World Bank have been working with protected area authorities to develop a coordinated plan that encompasses the entire Albertine Rift. Despite an unstable operating context and current unclear landscape delineations, success has recently been achieved in protected area mapping, stakeholder consultations, material support to park authorities, resettlements of illegal settlers, and improvement of community livelihoods.

Natural Resource Governance

To achieve conservation effectiveness, a regional framework for collaboration toward transboundary natural resource management has been established. This framework formalizes unofficial collaborations that have been supported by partners in gorilla areas and elsewhere in the landscape. A policy review of national and regional laws and policies relating to the conservation of great apes was completed and distributed to stakeholders for review and comments as part of the GRASP process. Training of ICCN staff has been provided on protected area planning, monitoring, and conflict resolution.

A process of demarcating protected area boundaries in Virunga National Park in consultations with local communities is in progress. The landscape partners are working with the communities to develop enterprises and alternative income-generating activities.

Natural Resource Monitoring Institutionalized

The Virunga Landscape has a wide variety of information available to help plan and monitor natural resource management actions. This includes information generated from ranger-based monitoring, socioeconomic surveys, law enforcement, a tourism health risk assessment, habitat restoration studies, and remote sensing/change detection. A ranger-based monitoring program for the Virunga Volcanoes has been expanded to cover the whole Virunga National Park to complement more detailed gorilla-monitoring efforts. Institutional support includes efforts to enhance and increase joint patrols, training, wildlife surveys, and both ecosystem and population monitoring, as well as the compilation of landscape reference materials.

A Foundation for Sustainable Development and Conservation in the Congo Basin: CARPE and CBFP

The Central African Regional Program for the Environment (CARPE) is implemented within the larger context of the programs and initiatives of multiple governmental, inter-governmental, and nongovernmental partners participating in the Congo Basin Forest Partnership. The U.S. Government contribution is an integral component of the much larger international CBFP effort.

CARPE intends to contribute to a sustainable future for the people of the Congo Basin by assisting Central African nations in their efforts to stem biodiversity loss and achieve sustainable natural resource management. Conservation and natural resource–based enterprises are essential for improving prosperity, enhancing livelihoods, and expanding equitable economic development in the region. While the challenges are many and sustained efforts are critical to progress, at the close of the first year of phase two CARPE implementation, it is clear that important foundations for success have been laid.

African institutions across the region are translating various political commitments to concrete actions on the ground. In the Republic of the Congo, a formal commitment to create a national service for protected areas and wildlife management is an important milestone, with an evaluation program to assess gaps in protected areas and their management under way. In Gabon, increased numbers of trained staff are being appointed to parks, infrastructure development is being planned, and outreach to local communities has been set in motion. Within the Democratic Republic of the Congo, ICCN has begun to regularly synthesize critical ecological and socioeconomic information gained from on-the-ground patrols and surveys to provide easily accessible information that informs decision makers in various institutions.

CARPE partners, many of whom have been working separately in the region for some time, are now pooling resources and collaborating in new ways to reach common goals. CARPE partner agencies have established a presence on the ground with a process under way in all priority landscapes to develop sustainable land and resource use plans with a diversity of stakeholders. Activities are expanding local capacities to manage protected areas, initiating innovative public-private partnerships for effective management of oil and logging concessions, and leveraging significant international support for continued work in the Basin.

CARPE is working to improve conservation and sustainable natural resource management for the benefit of Central African people in over 65 million hectares. For example, in the Sangha Tri-National Landscape, which straddles the borders of Cameroon, Republic of the Congo, and the Central African Republic, capacity-building efforts have led to the creation of a business development plan for the landscape. This plan will form the foundation for the soon-to-be-established Sangha Tri-National Trust Fund, the first of its kind in the region.

With the majority of the priority CARPE landscapes lying outside parks and reserves and operating under *de facto* or *de jure* administration of private sector companies, an effort to minimize the adverse environmental impacts of land uses within these areas is critical. In the past year, CARPE partners have collaborated closely with the private sector. For example, Shell Gabon, one of 15 oil companies in the region, is moving toward more socially and environmentally conscious investment in the region. The company's financial support for conservation and research within the Gamba Complex Landscape and its establishment of an environmental code for operations is a positive step in the direction toward corporate responsibility.

Within logging concessions, partners have worked to eliminate hunting of protected animal species and bushmeat trade, designate no-cut zones for sensitive wildlife areas, establish sustainable local hunting regulations for non-endangered game, minimize the extent of road development and associated detrimental impacts caused by illegal wildlife and plant harvesting, and close down roads following logging to minimize unsustainable and illegal exploitation. In the past year, several major logging companies operating in the region have taken significant steps toward adopting forest certification systems for hundreds of thousands of hectares of land, effectively raising the standard of forest management in the Congo Basin.

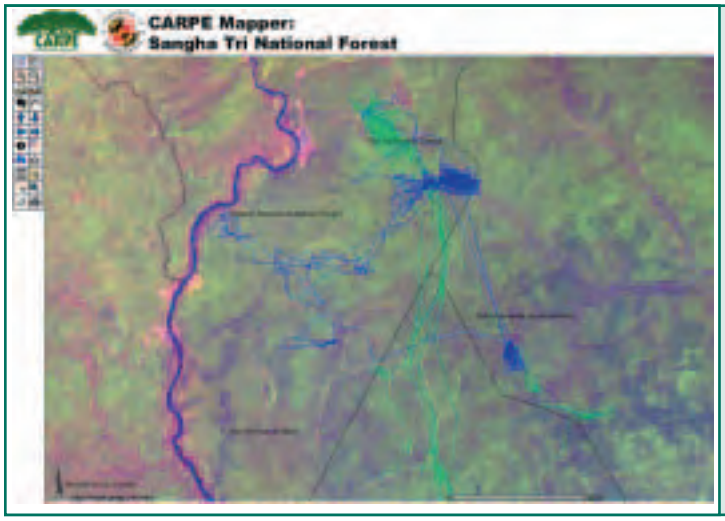
Generating significant financial resources to support the long-term management of Central Africa's valuable protected areas is a notable challenge that CARPE partners have taken on, and there have been significant gains in the past year. In Gabon, business plans for 13 new national parks are in the process of being developed, with significant resources already attracted. The national governments of Cameroon, Gabon, and the Republic of the Congo have endorsed the development of landscape management plans for the TRIDOM landscape, with UNDP/GEF resources over US$10 million already secured.

CARPE also continues to demonstrate that conservation programs can be successful in the midst of violent conflict, when partners are committed to political and diplomatic processes that complement technical approaches.

Through these efforts and others, CARPE initiatives have helped to retain the intrinsic and commodity values of the forest ecosystems of Central Africa. These are just a few important examples of progress. Much work remains to be done to uphold this cornerstone of sustainable economic development for Central African nations.

CARPE: Improving Effectiveness

In the coming years CARPE will continue its emphasis on partnerships, linking local and international players in support of long-term natural resource sustainability for the Congo Basin. To help Central Africans resolve seemingly intractable problems associated with poverty, limited livelihood opportunities, and unequal distribution of benefits among local people, collaborations must be strengthened. Sustained efforts, new ideas, and increased attention



Box 9. CARPE Mapper

CARPE Mapper is an interactive Web-based mapping tool that enables users to view and query spatial data from the 11 CARPE landscapes. Data are provided from a wide range of CARPE partners and include satellite-derived products such as active fires and vegetation maps and GIS layers such as population settlements, roads, rivers, protected areas, and biodiversity data—including the movements of forest elephants as shown at left. To find out more about CARPE Mapper go to http://maps.geog.umd.edu/carpemapper.

to generating benefits from conservation and natural resource–based economies within these partnerships are required.

A diverse program spanning such a large geographic area necessarily requires sound strategic planning, targeted tools, and effective monitoring systems to frame a consistent and complementary approach. In the next year CARPE partners will specifically focus on improved information sharing, communication, and conflict resolution.

New efforts are under way to harmonize approaches and methodologies, compile data, and make these more widely accessible to Central Africans (see Box 9). Ultimately, these efforts will enable policymakers to make more informed decisions.

Progress toward two critical milestones will also continue to be monitored within CARPE. First, the number of sustainable management plans established for different use zones within priority landscapes is used as a critical indicator of movement toward sustainability. In the past year alone, eight plans were put in place and endorsed by governments and local people. In coming years, CARPE partners will continue to work with the Central African people, private sector investors, and others to develop their own plans for sustainability within priority landscapes.

Second, CARPE's success relates to improved monitoring of the status of forest cover in priority areas. By establishing baselines of forest cover within landscapes, local partners are able to not only monitor change over time, but more important, they are able to use such information to take action and mobilize responses to threats endangering the long-term availability of Central Africa's natural resources. High-resolution satellite maps are available for all CBFP landscapes.

CARPE is committed to making a lasting contribution to the Congo Basin Forest Partnership by helping the people of the Congo Basin achieve effective conservation and sustainable natural resource management in the coming years. Efforts to increase forest-based livelihood opportunities that improve the well-being of Central Africans will be expanded. CARPE will continue to work with African institutions to build their technical, communications, and advocacy capacities in support of sustainable resource management and conservation. Partners will also continue to help Central Africans create an appropriate enabling environment for sustainable economic development, conservation, and natural resource management through the development and adoption of appropriate policies and legal instruments.

These expanded CARPE partnerships and activities, while important for the region, are just one part of a much wider group of players that are working to reach sustainable conservation and natural resource management goals in the Congo Basin. Continuing to link CARPE activities closely with enhanced national efforts and CBFP engagement are critical for success.

The Way Forward

The Partnership has succeeded in bringing additional support to the region's efforts and international attention to the importance of the Congo Basin Forest for both global environmental health and the well-being of people in the region. As this report has illustrated, a great deal has been learned and accomplished in the first two years of CBFP. However, to reach its full potential, the partners need to build expanded linkages well beyond traditional donor groups and forestry or environment ministries. Achieving important CBFP goals will be a long-term process that requires partners to be active at many levels, from national governments to the grass roots. The fact that CBFP includes a diverse set of partners presents certain coordination challenges; however, when those diverse strengths and experiences are harnessed in support of a common vision, they can yield extraordinary results.

Key Action Points

Build Stronger Links to Development Processes

Natural resources are inextricably linked to matters of peace, stability, human health, and economic growth. CBFP has a level of visibility well beyond that of many traditional environment programs. Nevertheless, awareness of the Partnership beyond conservation circles is lagging, leading to loss of opportunities to maximize synergies between conservation and development. Both environmental and development policy experts need to do more to understand, work with, and learn from the other side. Partners should seek opportunities to leverage increased interest and awareness of their programs, their results, and their challenges, including reaching out to nontraditional partners and taking part in development planning processes (such as poverty reduction strategy planning). This integration is crucial not only to ensure the overall success of CBFP and long-term financing for CBFP priorities but also to improve the quality of overall development policy.

Leverage CBFP's Impact on Governance

Transparency, accountability, rule of law, and lack of corruption are essential ingredients for both conservation and economic development. Landscape- and community-based conservation activities undertaken as part of CBFP can be powerful tools to foster good governance by demonstrating the benefits of participatory and transparent processes.

Through the active engagement of a variety of stakeholders in these processes, a new constituency of Central Africans calling for more democratic and open processes will be formed. Partners can help to ensure that the results of these improved processes are shared and understood at national and international levels.

Nurture Grass-Roots Support and Local Partners

Conservation is still too often perceived as an agenda imposed by rich foreigners who care more about African trees and animals than the well-being of African people. CBFP partners can continue to break down the false distinction between conservation and development through nurturing and expanding the circle of local partners, creating opportunities for training and advancement, and looking for opportunities that simultaneously empower local people, improve their livelihoods, and achieve conservation goals—all of which ultimately build a strong foundation for improved governance and economic development.

Encourage Innovative Collaboration with the Private Sector

The forest is a major economic resource attracting private sector investment that, under the right conditions, can contribute significantly to improved livelihoods and economic growth. Under the wrong circumstances, it is a resource exploited to the short-term benefit of a few and the long-term detriment of many. The establishment and enforcement of sound forestry, investment, and business codes will not only attract increased investment but will also encourage good corporate governance and responsible stewardship of the forest's resources. Partners should continue to support regulatory reform that encourages innovative market-driven approaches while ensuring strong regulatory oversight to limit and avoid potential negative environmental impacts. Equally important, governments, conservation professionals, and private investors need to think across sectoral lines to identify win-win collaboration opportunities such as those emerging in some logging concessions and in eco-tourism development.

Acronyms and Abbreviations

APDN	Local Fisheries Association of the Ndougou Department, Gamba Complex, Gabon
ASF	Aventures sans frontières
AWF	African Wildlife Foundation
BCI	Bonobo Conservation Initiative
Biotopic	Dutch Marine Turtle Conservation NGO, active in the Gamba Complex, Gabon
CAR	Central African Republic
CARE-RDC	Cooperative for Assistance and Relief Everywhere (DRC)
CARPE	Central African Regional Program for the Environment
CBFP	Congo Basin Forest Partnership
CBO	Community-based organization
CEFRECOF	Centre de formation et de recherche en conservation forestière
CI	Conservation International
CIB	Congolaise industrielle du bois (Congolese Timber Industry, a German-owned timber company)
CIDA	Canadian International Development Agency
CIESIN	Center for International Earth Science Information Network
CIFOR	Center for International Forestry Research
CIRMF	Centre international de recherches médicales de Franceville
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNIAF	Centre national des inventaires et de l'aménagement forestier (National Center for Inventories and Forest Management, ROC)
CNPN	Conseil national des parcs nationaux
CoCoSi	Comité de coordination du site (Site-based coordination committees, DRC)
COMIFAC	Conference of Ministers in Charge of Forest in Central Africa
CRAP	Comité de réflexion pour l'après-pétrole (After Oil Reflection Committee), Ndougou Département, Gamba Complex, Gabon
CREF	Centre de recherche en écologie et foresterie
DFGF	Dian Fossey Gorilla Fund
DFGFE	Dian Fossey Gorilla Fund Europe
DFGFI	Dian Fossey Gorilla Fund International
DRC	Democratic Republic of the Congo
ECOFAC	Ecosytèmes forestiers en Afrique centrale (Programme for Conservation and Rational Utilization of Forest Ecosystems in Central Africa)
EG	Equatorial Guinea
EGG	Exploitation gabonaise des grumes
EU	European Union
FCFA	Franc CFA (Communauté financière africaine) (African Financial Community Franc)
FIGET	Fondation internationale Gabon éco-tourisme
FORCOMS	Forest Concession Monitoring System
FSC	Forest Stewardship Council
FZS	Frankfurt Zoological Society
GCF	Global Conservation Fund
GEF	Global Environment Facility
GFW	Global Forest Watch
GIC	Gilman International Conservation
GIS	Geographic Information System
GPS	Global Positioning System
GTZ	Gesellschaft für Technische Zusammenarbeit (German Technical Agency for Development)
ha	Hectare(s)
HIV/AIDS	Human immunodeficiency virus/Acquired immune deficiency syndrome
HQ	Headquarters
Ibonga-ACPE	Local association for knowledge and conservation of the environment, Gamba Complex, Gabon
ICCN	Institut congolais pour la conservation de la nature (Congo Institute for Nature Conservation, DRC)
IFO-Danzer	Industrie forestière d'Ouesso - Danzer
IGAD	Intergovernmental Agency for Development
IGCP	International Gorilla Conservation Programme
INC	National Cartographic Institute of Gabon
INDEFOR	Instituto Nacional de Desarrollo Forestal (Institute of Forest Development, Equatorial Guinea)
IPHG	Idriss Plantation Holdings Gabon
IRET	Institut de recherche en écologie tropicale
IRM	Innovative Resources Management Inc.
JGI	Jane Goodall Institute
km	Kilometer(s)
km^2	Square kilometer(s)
LBV	Libreville
LTCR	Lac Télé Community Reserve
LTLT	Lac Télé–Lac Tumba Swamp Forest Landscape
LWRP	Lukuru Wildlife Research Project
m^3	Cubic meters

MEF	Ministry of Forest Economy
MEFCPET	Ministry of Water and Forest Resources, Hunting, Fisheries and Tourism (CAR)
MEFE	Ministry of Forest Economy and Environment
MIKE	Monitoring of the Illegal Killing of Elephants (a CITES program)
MINEF	Ministry of Environment and Forests
MODIS	Moderate Resolution Imaging Spectroradiometer
MOU	Memorandum of Understanding
MPI	Max Planck Institute
NGO	Nongovernmental organization
NP	National park
NSG	Nouvelle société gabonaise
OFR	Okapi Faunal Reserve (see RFO)
ORTPN	Office rwandaise du tourisme et des parcs nationaux
PA	Protected area
PBNP	Plateau Batéké National Park
PPG	Gorilla protection and reintroduction project
PSVAP	Project for the valorization of protected areas
REBAC	Central African Botanists Network
RFO	Réserve de faune à Okapi (see OFR)
ROC	Republic of the Congo
SBB	Société des bois de Bayanga
SBG	Société du bois du Gabon
SBL	Société des bois de Lastourville

SC	Siège central
SCD	Société pour la conservation et le développement
SEAF	Société d'exploitation et d'aménagement forestiers
SEEG	Société d'énergie et d'eau du Gabon
SEFAC	Société d'exploitation forestière et agricole du Cameroun
SG	Shell-Gabon
SI	Smithsonian Institution
SNP	Salonga National Park
STN	Sangha Tri-National
TBD	To be determined
TCCB	Tayna Center for Conservation Biology
TEF	Transformation Forestière
TFE	Total-Fina-Elf
TREES	Tropical Ecosystem Environment Observations by Satellites
TRIDOM	Dja-Minkébé-Odzala Tri-National (Landscape)
UCL	Université catholique de Louvain (Belgium)
UGADEC	Union des associations pour la conservation des gorilles et le développement à l'Est de la République démocratique du Congo (Union of Associations for the Conservation of Gorillas and Community Development of the Eastern Democratic Republic of the Congo)
UMD	University of Maryland
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNF	United Nations Foundation
UNGE	Universidad Nacional de Guinea Ecuatorial (National University of Equatorial Guinea))
USAID	United States Agency for International Development
UWA	Uganda Wildlife Authority
WCBR	Wamba Committee for Bonobo Research
WCS	Wildlife Conservation Society
WRI	World Resources Institute
WWF	World Wide Fund for Nature (World Wildlife Fund)
ZSM	Zoological Society of Milwaukee

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