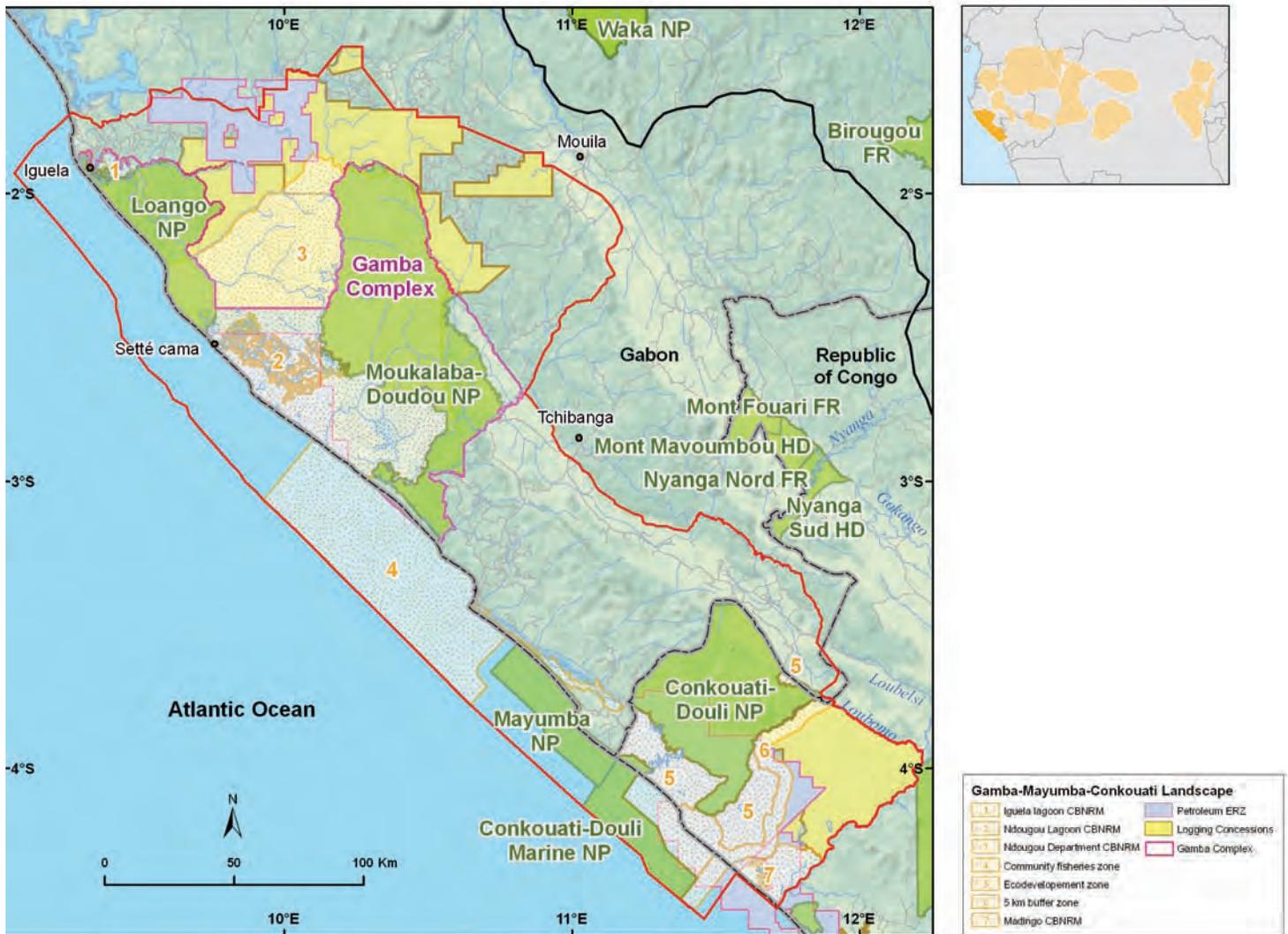


# CHAPTER 16

## GAMBA-MAYUMBA-CONKOUATI LANDSCAPE

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### Land Use Planning



Sources: *WWE WCS, UMD-CARPE, OSFAC, FORAF, IUCN, Tom Patterson, US National Park Service.*  
 Figure 16.1: Macro-zones in the Gamba-Mayumba-Conkouati Landscape

Since 2006, coordinated land use planning has shown a considerable degree of advancement. Key stakeholders in the Landscape, including park wardens of all four national parks, international conservation organization representatives, and resource persons from key technical ministries have held technical meetings in Mayumba, Libreville and Brazzaville resulting in the estab-

lishment of a formalized Technical Management Committee (TMC). The TMC working agenda has crystallized around the following key themes: (i) regional coastal surveillance and oil pollution surveillance and response; (ii) transboundary protected area management and creation of a bi-national protected area; and (iii) turtle protection.

Currently, in the framework of the Landscape land use plan, a coastal fisheries and oil pollution surveillance strategy is being finalized. Regarding fisheries surveillance, concerted action with technical ministries, including the department of fisheries, has focused on training, the building of onshore and boat-based surveillance, intervention capacity and lobbying the Departments of fisheries to actively address illegal fishing.

Our approach to coastal management and control has generated great interest from the US Navy. A training program for coastal sector employees (including Navy and fisheries boat pilots, ground surveillance staff, administration staff, etc.) was held by US Navy trainers in Mayumba in February 2008. Follow-up training programs, including assistance with regard to remote sensing of fishing vessels in waters beyond the range of current patrol vessels, are being developed. Terrestrial surveillance posts have been set-up in Conkouati (three), Mayumba (two), Sette Cama and Iguela. A fisheries support program funded by the African Development Bank for Gabon will further increase coastal surveillance capacity in two sites. Since July 2007, 35 reports of illegal offshore fishing have been compiled, which together with articles in the popular press, have led to increased public awareness of the problem of illegal fisheries in the region.

In April 2008, the first Pilot Committee meeting was held with all stakeholders from the Republic of Congo section of the Landscape. Given the global rise of oil and gas prices, oil and gas exploration and production activities continue to increase rapidly throughout the Landscape. Since

2006, on- and off-shore seismic campaigns have been carried out in several areas, including Loango National Park (by Sinopec) and Conkouati National Park (by Maurel & Prom and Perenco). An important effort in Gabon has been WCS/WWF involvement in the development and audit of the environmental and social management plan of the oil company Sinopec with regards to their exploration activities in Loango National Park in 2006 and 2007. A coastal sensitivity map is being finalized by Landscape partners. Lobbying is focused on delaying proposed seismic acquisition in the Dussafu Marin PSC offshore permit, currently scheduled during the upcoming humpback whale migration. Upcoming scheduled exploration activities for onshore permits between Loango and Moukalaba-Doudou national parks are being monitored.

Particular attention continues to be given to the monitoring and protection of marine turtles, and in particular to leatherbacks, for which the beaches of the Gamba-Conkouati Landscape constitute the world's most important nesting site. During the turtle nesting period (September – April) beaches were extensively monitored by dedicated field teams in Conkouati, Mayumba, Gamba and Iguela. In order to reduce accidental by-catch of turtles, Landscape partners worked with the United States National Oceanic and Atmospheric Administration (NOAA), with additional support from the Marine Turtle Conservation Fund, administered by the United States Fish and Wildlife Service (USFWS) to organize the first ever Turtle Excluder Device (TED) workshop in Gabon in September 2007. This workshop, organized by the Department of Fisheries, saw full participation of government and private sector, and included an 'at-sea' trial. Further TED trials will hopefully lead to legal requirements for TEDs in trawling fisheries.

Lastly, a draft bi-lateral Landscape collaboration agreement, based on existing COMIFAC models in Tridom and TNS, was presented during the Central Africa World Forest Heritage (CAWHFI) steering committee meeting in Brazzaville in March 2008. Overall agreement was reached that given the particular challenges unique to this Landscape (oil and gas and fisheries), Landscape partners will for now focus on the establishment of specific thematic agreements on Landscape oil and gas response, fisheries and the development of a bi-national protected area.



*Photo 16.1: The Rhizophora and their stilt roots are characteristic of mangroves.*



*Photo 16.2: Community fisheries, both in lagoons and at sea can be adversely affected by illegal trawling.*

**Box 16.1: CAWHFI**

The Central Africa World Heritage Forest Initiative (CAWHFI) is the product of a collaboration between the UNESCO World Heritage Centre and its national government and international non-government partners. Its main objective is to improve the management of a select number of natural sites in the Congo Basin that have been recognized for their exceptional value to the world and to further the integration of these sites into their surrounding ecological landscapes.

The protected areas selected by the Initiative are located in three different Congo Basin landscapes: the Sangha Tri-National Landscape, the Dja-Odzala-Minkébé (Tridom) Landscape and the Gamba-Mayumba-Conkouati Landscape.

Despite the growing recognition of the importance of these sites by national governments, national park authorities often have to make do with limited resources. The signature of the *Déclaration de Yaoundé* by most countries of the region, in 1999, clearly indicates their commitment to improving the situation and working towards a more sustainable management of these ecosystems. In collaboration with other members of the Congo Basin Forest Partnership (CBFP), CAWHFI is well integrated into this process and contributes significantly to the COMIFAC Convergence Plan.

CAWHFI is financially supported by the United Nations Foundation, the *Fonds français pour l'Environnement mondial* (FFEM) and the European Commission.

**Protected Areas**

In Gabon, the Law on National Parks was adopted in September 2007, and the national parks Agency (ANPN) created a month later. The overall management framework document for Gabon national parks (*Plan Cadre de Gestion*), also adopted in 2007, sets out the overall strategy for the development of Gabon's national parks for the period 2006-2020. Also, the long expected Gabon biodiversity support program funded by the Global Environment Facility (GEF) and administered by the World Bank was launched in December 2007, and service contracts were signed between the government of Gabon and WCS and WWF. Two-year work plans for Loango, Mouka-

laba-Doudou and Mayumba National Parks were adopted by ANPN in June 2008.

These long awaited events have created a strong momentum for the finalization of the park management plans, all of which are expected to be endorsed by the end of 2010. In the Republic of Congo, the awaited new agreement between the Government of Congo and WCS regarding Conkouati Douli National Park (CDNP) was signed in January 2008.



*Photo 16.3: Since 2001, the logging company CBG has been actively working to assure the long term sustainable development of its concession areas in the northern sector of the Landscape.*

## Extractive Resource Zones

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In Gabon, a collaboration agreement between the Ministries of forestry, the logging company CBG (*Compagnie des bois du Gabon*) and WWF was signed by the Minister in June 2008. The agreement sets out the roles and responsibilities of these partners in the development and implementation of a wildlife management plan for all CBG forest concessions in the northern sector of the Landscape. A draft plan has been submitted by WWF to CBG, for completion by CBG and the Ministry of Forest (MEFEPA) and endorsement during the first semester of 2009.

In the Republic of Congo, a strategy document has been developed for the Madingo-Kayes macro-zone. The zone includes logging concessions of Quator and Foralac and the forest plantations *Eucalyptus Fibre du Congo* (EFC). Maurel & Prom signed an agreement with the CDNP Conservator to pay for 5 surveillance guards in September 2007. Since then, Maurel & Prom has financed 5 of the current 28 guards at CDNP. In the same way, EFC will sign an agreement with the conservator to finance 10 surveillance guards in 2009.

## Community-Based Natural Resource Management Areas

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*Photo 16.4: The Hartlaub's Duck (Pteronetta hartlaubi) is common to the wetlands of Loango National Park and Lake Kivoro - a favorite place for waterfowl of the coastal basin of Gabon.*

## Human Activities

With the continued rise of global oil prices, both onshore and offshore oil and gas exploration and production projects have significantly increased within the Gamba-Conkouati Landscape since 2006. In Gabon, most of the long outstanding exploration permits have now been attributed, and seismic exploration activities started. Abandoned “marginal” fields and wells are being brought back into production by companies specialized in these niche markets. New land use planning issues have arisen. Several oil and gas permits overlap with protected areas as well as with sustainable forest management concessions leading to conflicting land use objectives, as well as to negative impacts, such as increased number of recorded oil spills and an increase in levels of bushmeat hunting.

The explosion of new oil and gas development activities continues to augment local employment opportunities within the Landscape, especially for unskilled temporary labor (road construction,

In Gabon, development of participatory fisheries management plans for communities in the Banio, Ndogo and Iguela lagoons is advancing well. However in the Republic of Congo, the government continues to permit semi-industrial fishing offshore fishing by an Asian fleet, having designated its vessels as “improved dugouts”. In Gabon an “After Oil Development Vision” has been developed for the Ndougou Department.

construction of oil and gas pipe lines, pumping stations, base camps, etc.). It is also attracting a specialized workforce from outside the area. Construction of new roads and maintenance of existing roads due to oil activities, combined with an increase in river and lagoon transport, leads to increased mobility of people in the Landscape, and also to an increase in long distance transport of bushmeat.

In Gabon, the impact of the oil industry on human livelihoods in the Landscape is apparent when comparing oil towns such as Gamba, and to a lesser extent, Omboué, with urban areas such as Tchibanga that are outside oil and gas influence. The influx of people attracted by the oil industry has increased the demand for bushmeat and agricultural products. High salaries in this sector also have led to local inflation of commodity prices and salaries in non-related sectors. Attractive oil-related job opportunities furthermore lead to a decrease in local agricultural production. In Con-

go, several sustainable agricultural micro-projects were abandoned in favor of short-term employment during oil and gas exploration.

Community fisheries, both at sea and in lagoons, continue to be adversely affected by the abuse of fishing zones by industrial trawlers. Most illegal trawling in and around Mayumba marine National Park now goes on under the cover of darkness in order to avoid detection and apprehension by the local authorities, who have been quite successful in reducing daytime trawling. In

the Republic of Congo, several dozen commercial trawler fishing boats, primarily Asian, declare themselves to be improved dugouts and thus continue to be allowed to fish within the six-marine mile zone reserved for local fishermen.

The pressure from illegal trawlers impacts the sustainability of coastal and lagoon fisheries that support local communities. The long-term impacts are likely to be economic, social and ecological if these trawlers activities are not swiftly brought under control.

**Table 16.1: Important agricultural products in the Gamba-Mayumba-Conkouati Landscape**

Agricultural product	Unit	Purchase price/unit* (\$)	Primary destinations	Date	Data collection	Sources
Cassava ( <i>Manihot esculenta</i> )	One kwanga	0.55 (village)/ 1.7 (city)	Village/ Pointe-Noire	Sep-07	Household surveys, Kondi, KM4 and Mpella villages	Michelle Wieland, unpublished data
Sardines (dried)	Bowl (~3kg)	6.67 (village)/ 11.11 (city)	Village/ Pointe-Noire	May-08	Permanent WCS employee (ex-poacher), socio-economic team	Guy-Noël Tchitiama, unpublished data
Split wood planks	Packet of 10 planks	2.22 (village)/6.66 (city)	Village/ Pointe-Noire	May-08	Permanent WCS employee (ex-poacher), socio-economic team	Guy-Noël Tchitiama, unpublished data
Plantain ( <i>Musa paradisiaca</i> )	100kg/bunch ( <i>régime</i> )	44.44 /7.77 + CFA500 per additional bunch	Inside Landscape	May-08	Survey of Mayumba market	Mayumba NP ecoguards
Cassava ( <i>Manihot esculenta</i> )	Stick ( <i>baton</i> )	0.44 or 0.55 per “ <i>baton</i> ”	Inside Landscape	May-08	Survey of Mayumba market	Mayumba NP ecoguards
Taro ( <i>Colocasia esculenta</i> )	Sack (usually re-sold by pile) Weight of sack unknown	33.33	Inside Landscape	May-08	Survey of Mayumba market	Mayumba NP ecoguards
Cassava ( <i>Manihot esculenta</i> )	Sack 50-100kg (exact weight of sack varies)/ 10 sticks ( <i>batons</i> )	22.22-27.77/ 5.55	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Plantain ( <i>Musa paradisiaca</i> )	Per kg/pile of 4 fingers	0.77/ 2.22	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Taro ( <i>Colocasia esculenta</i> )	Sack 50-100kg (exact weight of sack varies)/ 10 sticks ( <i>batons</i> )	66.66	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Cassava ( <i>Manihot esculenta</i> )	10 sticks ( <i>batons</i> )	6.66	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Banana (sweet)	One bunch ( <i>régime</i> )	6.66	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Plantain ( <i>Musa paradisiaca</i> )	Pile	11.11	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Cassava ( <i>Manihot esculenta</i> )	Sack 50-100kg/pile of 10 sticks	17.77/5.55	Département of Ndolou villages/ Mandji	Jun-08	Market survey	WCS and <i>Eaux et Forêts</i> Mandji team

Agricultural product	Unit	Purchase price/unit* (\$)	Primary destinations	Date	Data collection	Sources
Plantain ( <i>Musa paradisiaca</i> )	Bunch ( <i>régime</i> )/ pile of 6 fingers	4.44 - 8.88 / 2.22	Département of Ndolou villages/ Mandji	Jun-08	Market survey	WCS and <i>Eaux et Forêts</i> Mandji team
Taro ( <i>Colocasia esculenta</i> )	Pile	2.22	Département of Ndolou villages/ Mandji	Jun-08	Market survey	WCS and <i>Eaux et Forêts</i> Mandji team
Cassava ( <i>Mani- hot esculenta</i> )	Sack 50-100kg/ pile of 10 sticks ( <i>batons</i> )	11.11/4.44	Villages/ Tchibanga	Jun-08	Market survey	Moukalaba- Doudou NP ecoguards and WWF
Plantain ( <i>Musa paradisiaca</i> )	Per kg	0.44	Villages around Tchibanga	Jun-08	Market survey	Moukalaba-Dou- dou NP ecoguards
Taro ( <i>Colocasia esculenta</i> )	Sack 50-100kg	33.33	Tchibanga	Jun-08	Market survey	Moukalaba- Doudou NP ecoguards

\*Based on an exchange rate of \$ 1 = CFA 450

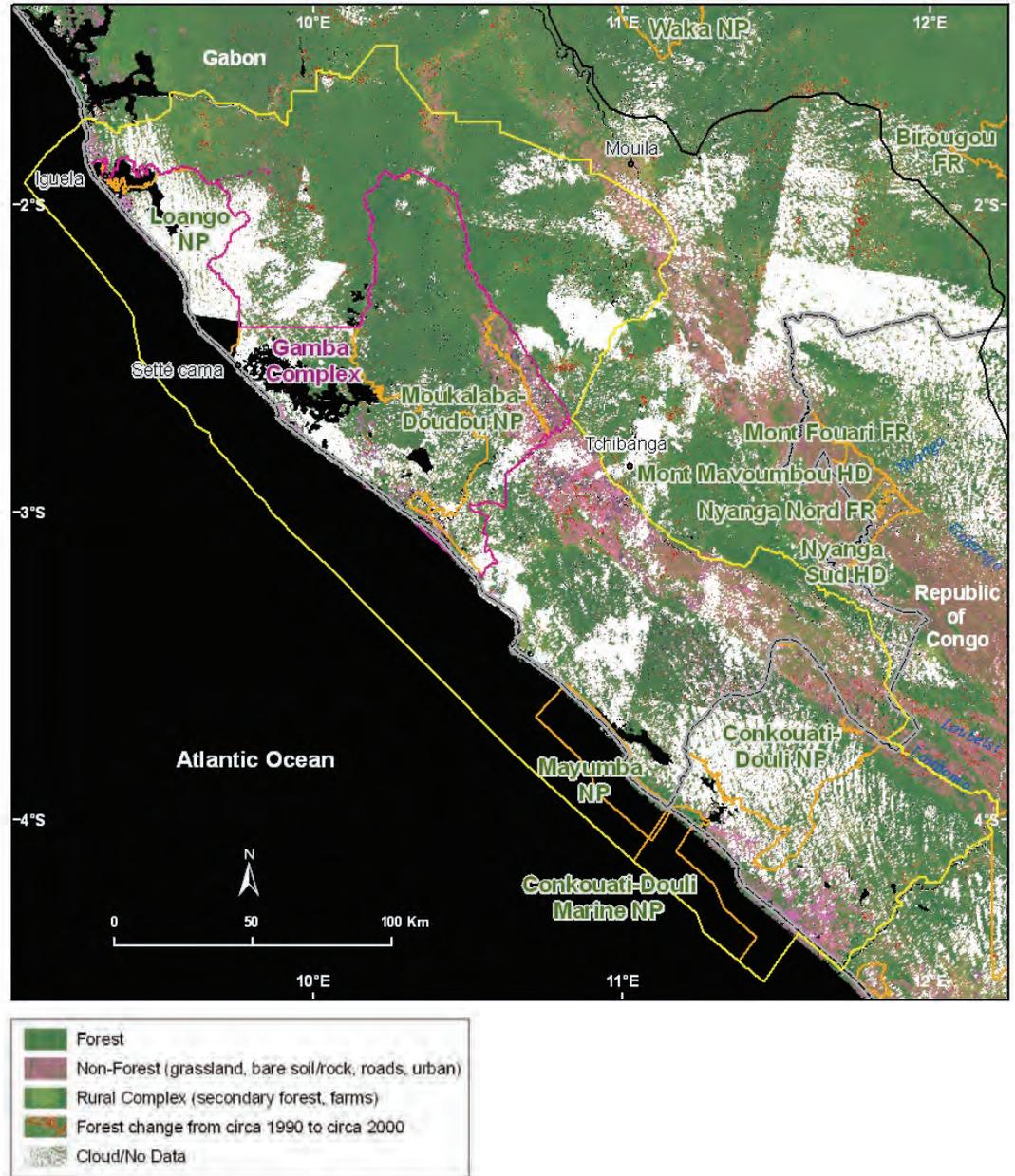
**Table 16.2: Bushmeat trade in the Gamba-Mayumba-Conkouati Landscape**

Bushmeat species	Unit	Purchase price/ unit* (\$)	Primary destinations	Date	Data collection	Sources
Blue duiker ( <i>Cephalophus monticola</i> )	Whole	5.55 village / 16.55 city	Village / Pointe-Noire	Sep-07	Household surveys: Kondi, KM4 and Mpella villages	Michelle Wieland, unpublished data
Brush-tailed porcupine ( <i>Atherurus africanus</i> )	Whole	6.67 village / 17.78 city	Village / Pointe-Noire	May-08	WCS, socio-economic team	Guy-Noël Tchitia- mouna, unpublished data
Moustached monkey ( <i>Cercopithecus cephus</i> )	Whole	12.22 village / 24.44 city	Village / Pointe-Noire	May-08	WCS, socio-economic team	Guy-Noël Tchitia- mouna, unpublished data
Blue duiker ( <i>Cephalophus monticola</i> )	Depends on size	6.66 or 7.77	Inside Landscape	May-08	Mayumba market survey	Mayumba NP ecoguards
Brush-tailed porcupine ( <i>Atherurus africanus</i> )	Depends on size	6.66 or 7.77	Inside Landscape	May-08	Mayumba market survey	Mayumba NP ecoguards
Monkey spp.	Depends on size	5.55/11.11	Inside Landscape	May-08	Mayumba market survey	Mayumba NP ecoguards
Duiker spp. (usually Blue duiker ( <i>Cephalophus monticola</i> )	Depends on size	11.11/13.33	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Red river hog ( <i>Potamocho- erus porcus</i> )	Per kg / lgigot	3.33/33.33	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Brush-tailed porcupine ( <i>Atherurus africanus</i> )	Depends on size	13.33/17.77	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Crocodiles (generally slender-snouted crocodile ( <i>Crocodylus cataphractus</i> ) and dwarf crocodile ( <i>Oste- olaemus t. tetraspis</i> )	Per kg / half piece	2.22/16.66	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards

Bushmeat species	Unit	Purchase price/ unit* (\$)	Primary destinations	Date	Data collection	Sources
Small monkey spp.	Depends on size	11.11/22.22	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Forest buffalo ( <i>Syncerus caffer nanus</i> )	1 gigot/ Per kg	77.77 or 88.88/11.11	Gamba	Jun-08	Market survey	WWF and Loango NP ecoguards
Fish (fresh)	Per kg	1.77	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Fish (salted)	Per kg	3.33	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Red river hog ( <i>Potamochoerus porcus</i> )	Per kg	5.55	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Forest buffalo ( <i>Syncerus caffer nanus</i> )	Per kg	2.22	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Blue duiker ( <i>Cephalophus monticola</i> )	Whole	11.11	Omboué	May-08	Market survey	WCS and <i>Eaux et Forêts</i> Iguela team
Duiker spp. ( <i>Cephalophus monticola</i> , <i>Cephalophus dorsalis</i> , <i>Cephalophus ogilbyi</i> )	Depends on size and species	8.88/22.22	Mandji	Jun-08	Market survey	Mandji WWF and <i>Eaux et Forêts</i> team
Red river hog ( <i>Potamochoerus porcus</i> )	Whole/ Per kg/1 hind leg/1 front leg/ rib/lower jaw	100/8.88/26.66 - 33.33/20.00 - 22.22/6.66 - 8.88/ 4.44	Mandji	Jun-08	Market survey	Mandji WWF and <i>Eaux et Forêts</i> team
Brush-tailed porcupine ( <i>Atherurus africanus</i> )	Depends on size	7.77	Mandji	Jun-08	Market survey	Mandji WWF and <i>Eaux et Forêts</i> team
Sitatunga ( <i>Tragelaphus spekei</i> )	Whole/1 front leg/ 1 hind leg	66.66/17.77/ 22.22	Mandji	Jun-08	Market survey	Mandji WWF and <i>Eaux et Forêts</i> team
Water chevrotain ( <i>Hyemoschus aquaticus</i> )	Whole	13.33	Mandji	Jun-08	Market survey	Mandji WWF and <i>Eaux et Forêts</i> team
Forest buffalo ( <i>Syncerus caffer nanus</i> )	Per kg	1.77	Mandji	Jun-08	Market survey	Mandji WWF and <i>Eaux et Forêts</i> team
Blue duiker ( <i>Cephalophus monticola</i> )	Whole	7.77	Tchibanga	Apr-08	Market survey	Moukalaba-Doudou NP ecoguards
Red river hog ( <i>Potamochoerus porcus</i> )	1 Gigot	15.55	Villages/ Tchibanga	Jun-08	Market survey	Moukalaba-Doudou NP ecoguards and WWF
Brush-tailed porcupine ( <i>Atherurus africanus</i> )	Whole	11.11	Tchibanga	Apr-08	Market survey	Moukalaba-Doudou NP ecoguards

\* Based on an exchange rate of \$ 1 = CFA 450

## Forest Cover



Sources: SDSU, UMD-CARPE, NASA, SRTM, IUCN, FORAF

Figure 16.2: Composite Landsat satellite image of the Gamba-Mayumba-Conkouati Landscape overlain with 1990 to 2000 forest loss (in red)

**Table 16.3: Forest Cover and Forest Loss in the Gamba-Mayumba-Conkouati Landscape from 1990 to 2000**

Landscape area	Forest area			1990-2000 (km <sup>2</sup> )	Forest loss		
	1990 (km <sup>2</sup> )	2000 (km <sup>2</sup> )	2005 (km <sup>2</sup> )		1990-2000 (%)	2000-2005 (km <sup>2</sup> )	2000-2005 (%)
35,073	29,153	28,709	N/A	444	1.52	N/A	N/A

Forest cover and forest cover loss are derived from Landsat and MODIS satellite data.

Sources: SDSU, UMD-CARPE, NASA.

## Large Mammal and Human Impact Monitoring



Sources: WWF, WCS, Max Planck, UMD-CARPE, OSFAC, FORAF

Figure 16.3: Biological surveys conducted in the Gamba-Mayumba-Conkouati Landscape

### Special Interest

MEFEPA/CBG/TEREA/WWF

Land use planning and logging concessions' macro-zoning in the Gabon segment of the Gamba-Conkouati Landscape have significantly changed over the last year due to the geographical relocation of activities of the logging company CBG (*Compagnie des bois du Gabon*), which is the only industrial company within the Gabon segment of the Landscape.

A family company established more than 20 years ago in the south-west of Gabon and owning several different smaller concessions, CBG decided in 2001 to aim at long term sustainable development of their concession areas. Follow-

ing four years of inventories, studies and consultations, the management plan for the Forestry Concession under Sustainable Management (*Concession forestière sous aménagement durable (CFAD)*), located in the northern periphery of the Gamba Complex of Protected Areas, covering a total surface area of 352,100 ha, was approved by the Ministry of Forestry (MEFEPA). During the same period, CBG also prepared a management plan for a second CFAD within the Landscape, called CFAD-Mayumba (192,000 ha), located in the Mayombe hills near the border with the Republic of Congo.

In March 2007, within the framework of the Central Africa World Heritage Forest Initiative (CAWHFI) and the Congo Basin Forest Partnership (CBFP), a partnership was formalized between MEPEPA, WWF and CBG, with the support of the consultancy firm TEREA, for the implementation of a wildlife management program in all forest areas under CBG management.

This partnership aims to develop and implement a wildlife management plan for all logging

concessions under CBG management, with the active participation of all stakeholders concerned (CBG, local populations, local authorities, international NGOs, UNESCO, research institutes, the national forestry school (ENEF) and several oil and gas companies). To achieve this goal, a joint MEPEPA/WWF office was opened in the local town of Mandji in April 2007.

After only one year of operations of the program, very important progress has been made



*Photo 16.5: As in many rivers in Gabon, the slender-snouted Crocodile (*Mecistops cataphractus*) is still quite common on the Bongo River, which flows into Ndougou Lagoon.*



*Photo 16.6: Sawing on site reduces the volume of wood that has to be transported.*

on the ground, and more than half of its objectives have already been met. Current key actions include the finalization and endorsement of the wildlife management plan and the active involvement of oil companies in its execution.

Early 2008, the Ministry of Forestry Economy initiated a series of consultations with CBG and conservation professionals, in order to substitute the CFAD of Mayumba with a new forest area guaranteeing CBG's long term economic survival and the development of its industrialization program, while evolving towards Forest Stewardship Certification (FSC) for all its concession areas as of 2009.

As a result of numerous meetings between the General direction of the Ministry of Forestry, international NGOs and the scientific community, CBG signed a Provisional Management Agreement for Exploitation and Transformation (*Convention provisoire d'aménagement exploitation et transformation (CPAET)*) with the forest administration for a concession of 260,500 ha located to the south of their current CFAD.

This area, known for its high biodiversity, partially overlaps two Hunting Domains within the Gamba Complex between Loango and Moukalaba Doudou national parks. The area is also known

as the ecological industrial corridor because of the importance of the biodiversity of these forests in relation to ongoing oil production activities by oil and gas companies (Dallmeier *et al.*, 2006; Buij *et al.*, 2007).

Results from biodiversity studies in the area, mainly undertaken by the Smithsonian Institution, as well as results from ongoing forest and wildlife inventories, undertaken by CBG with technical and staffing support from WWF, will serve to establish the management plan for this concession and to identify its High Conservation Value Forests, with the overall aim to propose new zoning for the remaining protected areas within the Gamba Complex.

As a result of this process, about 200,000 ha will be attributed to CBG to constitute a new CFAD, with the remaining surface area to be reclassified as protected area. This zoning will be submitted for endorsement by the Government in order to maintain the important biodiversity of the Gamba Complex and to assure the long term conservation of wildlife populations and biodiversity within the CFAD of CBG and the adjacent protected areas, forming a total forest area of more than 1,500,000 ha under sustainable management.

**Table 16.4: Biological survey results from the Gamba-Mayumba-Conkouati Landscape**

Survey	Site name	Survey date	Lead organization(s)	Number of transects	Total km of transects	Methodology	Elephant presence	Elephant dung pile encounter rate per km
1	Conkouati-Douli NP	Jul-Aug 08	WCS	115	114.34	Line-transect foot survey	Yes	1.58 ± 0.26
2	Mayumba NP	Sep 07	WCS	23	32.57	Annual monitoring of 32 transects in limited terrestrial zone of the park	Yes	4.45 (c.i. 2.69)
3	Loango NP	Feb 06-Sept 07	WCS, WWF	215	202.643	Line transect	Yes	11.894 ± 0.003
4	Loango NP	Mar 06-Aug 07	WCS, WWF	302		Point transect	Yes	10.982 ± 0.003
5	Moukalaba Doudou NP	Apr 04-Jul 05	Max Planck / WWF	439		Point transect	N/A	N/A

1) Vanleeuwe, 2008.

2) WCS, unpublished report.

3) and 4) WCS and WWF, unpublished report.

5) Max Planck/WWF, undated.

5.1) Kuehl, et al., 2007.

5.2) Kuehl, et al., submitted.

	Elephant dung pile density per km <sup>2</sup>	Ape presence	Ape nest encounter rate per km	Ape nest density per km <sup>2</sup>	Ape nest group encounter rate per km	Ape nest group density per km <sup>2</sup>	Human sign presence	Human sign per km
	339 ± 63	Yes	1.21 ± 0.17	2.23 ± 0.45	1.65 ± 0.17		Yes	3.47 ± 0.41
	N/A	Yes			0.90 (c.i. 0.49)	N/A		3.02 (c.i. 1.69)
	1,217.61 ± 323.75	Yes	1.15 ± 0.06	27.49 ± 10.30			Yes	0.91 ± 0.11
	1,807.37 ± 334.26	Yes	0.77 ± 0.06	59.54 ± 21.80			Yes	0.25 ± 0.09
	N/A	Yes	3.08 ± 0.02	1378.1±170.40	0.7835 ± 0.08	336.84 ± 52.3	No	

