



50% decline

In some areas, ape populations have declined by more than 50% over the last twenty years.

20 years

## Regional Action Plan for the Conservation of Chimpanzees and Gorillas in Western Equatorial Africa

Hope

Implementation of the recommendations in this plan will make a significant difference to the survival of great apes in this region.

Survival



The two subspecies of great ape in western equatorial Africa: the central chimpanzee *Pan troglodytes troglodytes* and the western lowland gorilla *Gorilla gorilla gorilla*



The central chimpanzee  
(*Pan troglodytes troglodytes*)



The western lowland gorilla  
(*Gorilla gorilla gorilla*)  
[LEFT] Adult female; [RIGHT] adult male

Stephen D. Nash

The world's leading experts agree that the investment and actions described in this plan constitute the best strategy for preserving wild chimpanzees and gorilla populations in western equatorial Africa.

# Regional Action Plan for the Conservation of Chimpanzees and Gorillas in Western Equatorial Africa

(*Pan troglodytes troglodytes* and *Gorilla gorilla gorilla*)

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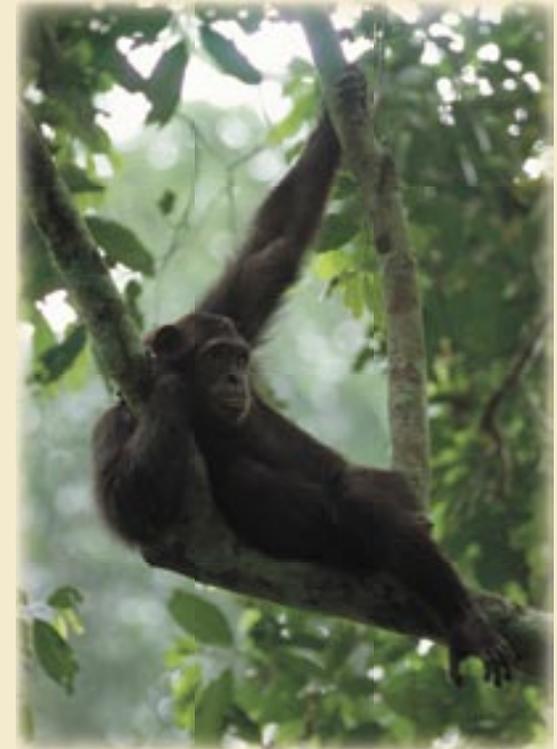
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## Abstract

This action plan represents a consensus of the world's leading experts on the priority areas and priority actions needed for preserving wild chimpanzee and gorilla populations in western equatorial Africa. The results were generated at a workshop held in Brazzaville, Republic of Congo in May 2005 with over 70 participants representing range-state governments, national and international conservation organizations, research institutions and funding agencies. Workshop participants agreed that by far the most serious short-term threats to apes in this region are poaching and disease epidemics. In the longer term, however, workshop participants believed

that habitat loss and disturbance will become as serious a threat as hunting and disease. Experts agreed upon a list of 12 priority areas (seven exceptional areas and five important areas), as well as two areas that are priorities for surveys. These areas sum to a total of over 150,000 km<sup>2</sup>. Experts also identified knowledge gaps including improved census methods and information accessibility, large-scale survey and monitoring efforts, and further research on Ebola. The experts recommended actions that could improve the conservation outlook of these apes, and estimated the cost at about \$29,275,000 over the next five years.



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A young male chimpanzee in the Goualougo Triangle, Nouabalé-Ndoki National Park, Republic of Congo. These chimpanzees were found to exhibit naive behavior when first observed by researchers, suggesting that they have had limited contact with humans.



© Nick Nichols, NGS

An adult male gorilla, showing silvering of the back and the red crest that is characteristic of western lowland gorillas.

## Introduction



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Sunrise over Mbeli Bai, a natural swampy forest clearing that is frequented by western lowland gorillas. The Mbeli Bai is in the Nouabalé-Ndoki National Park, Republic of Congo.

**T**HE WESTERN EQUATORIAL AFRICAN RAINFOREST is home to two subspecies of great ape: the central chimpanzee *Pan troglodytes troglodytes* and the western lowland gorilla *Gorilla gorilla gorilla*<sup>1</sup>. These two subspecies are sympatric over most of their range, which extends throughout much of lowland forested habitats in Cameroon, Central African Republic, Gabon, Equatorial Guinea and the Republic of Congo, with outlier populations in Cabinda (Angola) (Figure 1, following page). In this plan we call this region western equatorial Africa.<sup>2</sup> This unique phenomenon — nowhere else do two ape subspecies share almost identical ranges — allows unified conservation planning for the two.

Surveys in the 1980s indicated that healthy populations of both species existed in many areas remote from

human settlements. However, despite the fact that western equatorial Africa has one of the lowest human population densities of any tropical forest area in the world, ape populations in this region are, today, in dramatic decline. This is largely because of increased commercial hunting, the spread of logging, which alters forest structure and facilitates poaching, and because of Ebola haemorrhagic fever. Awareness of this crisis, combined with the recognition that the extinction of our closest living relatives would be an inestimable loss, has driven the creation of major international initiatives, such as the Section on Great Apes of the IUCN/SSC Primate Specialist Group and the Great Ape Survival Project (GRASP). In addition, there are many site-based, national and international projects that work to conserve great apes in this region and around the world. The continuing, rapid decline of great apes in western equatorial Africa indicates that past efforts are not sufficient, and that more is needed.

In particular, successful protection of great apes requires a more concerted and collaborative effort to establish region-wide priorities, and to identify partners and donors with which to implement and monitor regional strategies. The following plan details such a strategy for protecting chimpanzees and gorillas in the western equatorial region of Africa. It is the result of a workshop held in Brazzaville, Republic of Congo, on May 17–20<sup>th</sup> 2005, where key players in great ape conservation developed a unified strategy for the conservation of these two species of great ape. The expert group included biologists, veterinarians, protected areas

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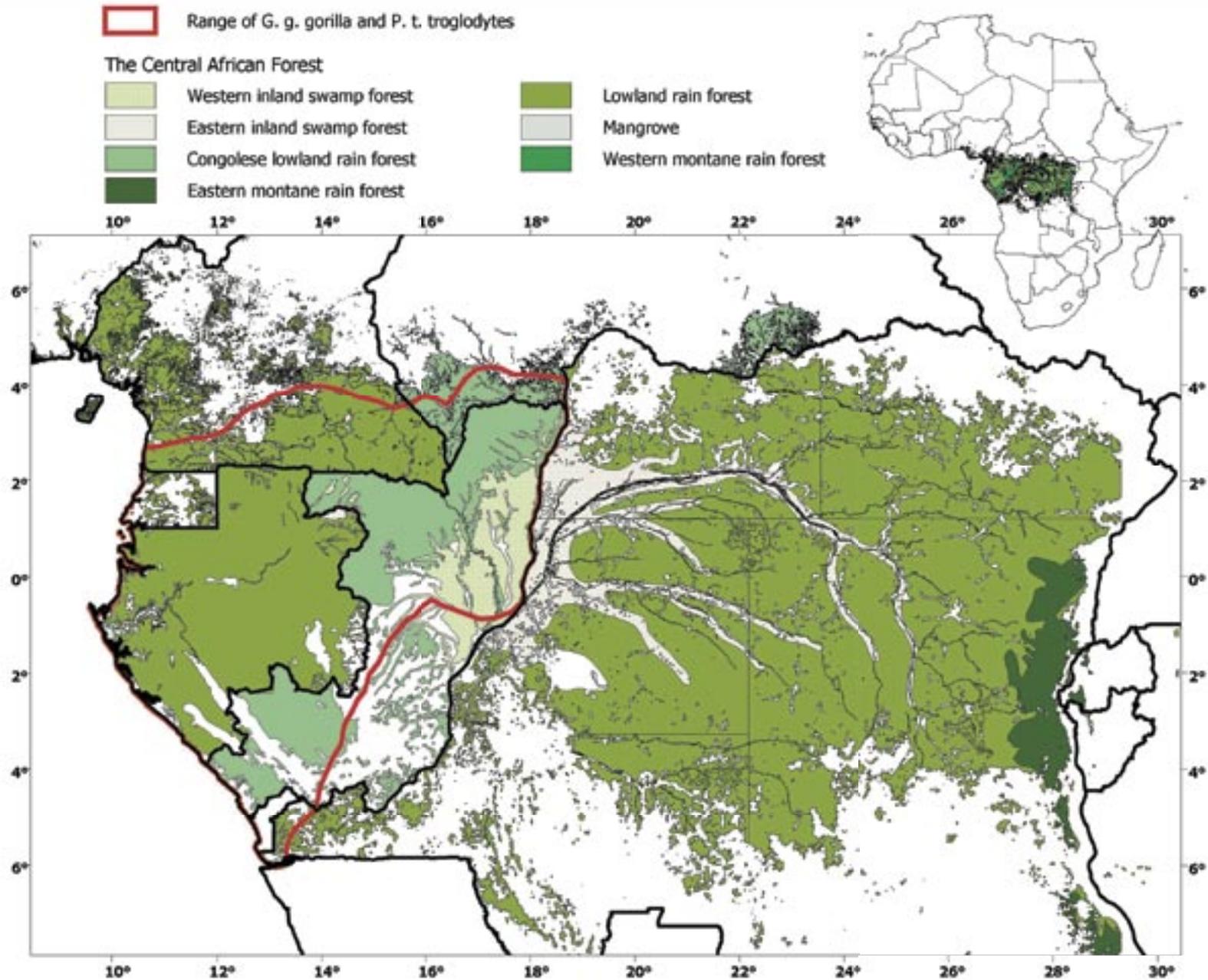
**In particular, successful protection of great apes requires a more concerted and collaborative effort to establish region-wide priorities, and to identify partners and donors with which to implement and monitor regional strategies.**

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managers, government officials and representatives of national and international non-governmental organizations. This group produced this action plan, and a strategy for its long-term implementation. This action plan identifies priorities for these great apes and their populations, indicating the measures required and the means to address them. We hope that this document will provide a clear investment plan for researchers, conservationists, and donors and, most importantly, will assist habitat country governments in developing strategies for the conservation of great apes.

<sup>1</sup> A second subspecies of chimpanzee (*Pan t. vellerosus*) as well as the Critically Endangered Cross River gorilla (*Gorilla g. diehli*) exist in western Cameroon. Both *Pan t. vellerosus* and *Gorilla g. diehli* also occur in Nigeria. These subspecies require independent assessment for conservation as conditions vary from those in the rest of western equatorial Africa and they will therefore not be covered in this plan.

<sup>2</sup> It is also possible that small populations of *P. t. troglodytes* and *G. g. gorilla* remain in the south-west of the Democratic Republic of Congo but this requires confirmation.



**Figure 1.** The range of chimpanzees, *Pan troglodytes troglodytes*, and gorillas, *Gorilla gorilla gorilla*, in western equatorial Africa. Map by Stephen Blake, WCS.

## Western Equatorial Africa in Context

**I**N 2002, AN EXPERT WORKSHOP HELD in Abidjan, Côte d'Ivoire, resulted in a Regional Action Plan for the Conservation of Chimpanzees in West Africa (Kormos and Boesch, 2002) presenting consensus on an optimal conservation strategy for chimpanzees in that region. The situation in western equatorial Africa differs in many important ways, so although the same methodology was followed by holding an expert workshop in Brazzaville, the particular context of the western equatorial Africa region provides the backdrop for the conservation strategy outlined in this report. The specificities of the region, that provide windows of opportunity for effective conservation of apes on the one hand, present, on the other hand, some major obstacles (see Table 1).

**Table 1.** Opportunities and obstacles for effective conservation of great apes in western equatorial Africa.

Opportunities	Obstacles
Large areas of potential ape habitat remain compared to more densely populated regions such as west Africa and southeast Asia.	The major threats — poaching, habitat destruction and Ebola — will be difficult to reduce and even well-managed protected areas offer no protection from the spread of diseases. New approaches therefore must be developed.
Large protected areas exist, (most of them national parks) many of which have been created in recent years and have ongoing conservation projects.	Large areas of previously remote forest are being, or soon will be, selectively logged. Without firm control actions poaching will continue to increase as human population increases and new roads allow access and transport possibilities.
Political will for conservation and for regional cooperation in the environmental arena is strong, (e.g., creation of 13 national parks in Gabon in 2002; 2 <sup>nd</sup> Summit of Central African Heads of State on Conservation and Sustainable Development (COMIFAC), Brazzaville, February 2005).	National management, law enforcement, research and monitoring capacity are generally weak, and building capacity through training and mentoring will take time.



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Two male chimpanzees pant-hoot at researchers in the Goulougo Triangle. The central chimpanzee is the least known of all the subspecies. Pioneering research investigating the behavioral and social impacts of commercial logging on chimpanzee populations is currently being conducted at this site.

## How Priority Areas Were Identified

**T**HE BRAZZAVILLE WORKSHOP PARTICIPANTS used the best available data and their long years of experience to identify the priority areas in western equatorial Africa based on a set of standard criteria (Box 1). The first criterion in choosing priority areas for ape conservation was population size given the central insight of conservation biology: that large populations tend to have higher long-term viability than small populations. Because of methodological limitations which preclude precise quantification of population size and make it impossible to distinguish reliably between indirect signs (nests, feeding trail and feces) left by gorillas from those left by chimpanzees (see Box 2 on following page for further information), a 5-point scale of size estimates was used for combined ape populations. The second criterion was the size of habitat blocks. The third criterion was the rank attributed at the 2000 Libreville biodiversity vision workshop<sup>3</sup> which indicates the importance of each site in terms of biodiversity in general, thus providing a measure of the importance of the area for the conservation of taxa other than great apes. Furthermore, most of the priority areas identified at the 2000 Libreville biodiversity vision workshop are now benefiting from some conservation activities, thus increasing the feasibility of great ape conservation in these areas as well.

Area identification began with the assessment of discrete management units (protected areas, logging

<sup>3</sup> In 2000 a WWF-sponsored workshop in Libreville, involving more than 150 national and international specialists, defined the priority targets for conservation and laid out the vision for biodiversity conservation and sustainable development in central Africa.

### Box 1. Criteria for selection of priority areas for ape conservation in western equatorial Africa

1. Population size, scored on a 5-point scale:
  - 5 > 4,000 apes
  - 4 > 2,000
  - 3 > 1,000
  - 2 > 500
  - 1 > 250
2. Area of site:
  - 5 > 16,000 km<sup>2</sup>
  - 4 > 8,000 km<sup>2</sup>
  - 3 > 4,000 km<sup>2</sup>
  - 2 > 2,000 km<sup>2</sup>
  - 1 > 1,000 km<sup>2</sup>
3. Importance for conservation and sustainable forest management attributed at the 2000 Libreville biodiversity vision workshop:
  - 4 Highest importance
  - 3 High
  - 2 Medium
  - 1 Low

In addition, a *post hoc* assessment of the quality of data available for the estimate of ape population size at each site was assessed on a 5-point scale based on the time elapsed since the data were collected and the methodology: **1** – Unsubstantiated (presence/absence or surveys undertaken before 2000); **2** – Low Quality (Recce surveys after 2000, or Single transect survey after 2000, with <50 km survey effort); **3** – Minimal Quality (Single transect survey after 2000 with >50 km effort in a specific area, or Multiple transect surveys after 2000 with <50 km effort in different areas); **4** – Good Quality (Multiple transect surveys after 2000 with ≥50 km effort in different areas); **5** – Best Quality (Multiple transect surveys after 2000 with ≥50 km effort in different areas and nest decay rate available for the area and density estimate reported with 95% confidence limits).



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A female gorilla peers at a researcher. Western lowland gorillas spend a considerable amount of time in trees eating ripe fruits and leaves.



© Bethan Morgan

The mountains of the Ebo Forest, Cameroon. A small population of gorillas with unknown taxonomic affiliation was discovered there in 2002.

concessions, and community forests) in each country for their potential for ape conservation. Subsequently, units with shared boundaries were grouped appropriately within and between countries to produce a list of regional areas. Priority areas were then ranked according to the following two classifications:

**I. Exceptional Areas:** All areas with the largest ape populations (Score 5) as well as areas with large populations (Score 4) combined with a large size (Score 4) and the greatest importance for biodiversity conservation (Score 4).

**II. Important Areas:** All other areas with large populations (Score 4) as well as areas with medium populations (Score 3), which are also large (Score 3 or more) and important for biodiversity conservation (Score 3 or more).

Additional areas were identified as requiring urgent surveys if existing data do not allow for estimates of population size.

**III. Priority Areas for Surveys:** Areas that are believed to be very important for ape conservation, but for which no population estimate exists, making surveys an urgent priority. They can then be ranked appropriately, based on these surveys.

### Box 2. Why we are not estimating the number of chimpanzees and gorillas in this action plan

The natural starting point for a conservation strategy is to assess how many gorillas and chimpanzees remain, in order to identify the location of populations that will be viable over the long term if necessary actions are carried out to reduce threats. Unfortunately, for two major reasons it is impossible to estimate the total numbers of gorillas and chimpanzees remaining in western equatorial Africa. They are:

**Methodological Problems:** Existing survey/census methods lack precision and field sampling has often been flawed making extrapolation to the large areas of potential habitat extremely risky. In addition, recent large-scale surveys carried out by the Monitoring of Illegal Killing of Elephants (MIKE) project<sup>4</sup> have not been able to distinguish reliably between indirect sign left by gorillas from those left by chimpanzees, and thus provide only estimates of ape numbers, i.e., summed density of gorillas and chimpanzees.

**Nature of Threats:** Ebola can cause dramatic declines in gorilla and chimpanzee populations in a very short time, and present monitoring systems preclude consistent identification of the passage of epidemic disease in most remaining blocks of ape habitat. Thus, survey data can be considered as reliable only when relatively recent and in areas where some monitoring occurs as part of ongoing conservation projects. The present inability of conservation managers to assess population size of gorillas and chimpanzees and monitor trends over time with reasonable accuracy is a severe handicap, which requires urgent attention if efforts to protect these species are to succeed. Without reliable indicators to track the effectiveness of implementation of the strategy it will be difficult to maintain the necessary levels of support, and the ability for adaptive management, that are essential to conservation. However, the dangers of providing estimates of numbers of surviving apes that are seriously flawed, either because of methodological problems or because they are out of date, are also clear. It was decided at the workshop therefore, to apply the principal of precaution and use proxy values for best-estimates of minimum population size.

<sup>4</sup> The overall goal of MIKE is to provide information needed for elephant range states to make appropriate management and enforcement decisions, and to build institutional capacity within the range states for the long-term management of their elephant populations.



© Fiona Maisels/WCS

Gabonese field researchers look for ape nests during an ape population survey.



© David Greer

Getting western lowland gorillas used to the presence of researchers at the Mondika Research Center on the CAR/Congo border. Dense forest habitat and the gorillas' large home ranges have hampered efforts to habituate and observe them in the wild, and only recently have new data been made available on aspects of their behavior and ecology.

## Priority Areas and Area-Specific Priority Actions for Chimpanzees and Gorillas in Western Equatorial Africa

**EXPERTS AGREED ON A LIST OF 12 PRIORITY** areas (seven exceptional areas and five important areas) as well as two areas that are priorities for surveys. These priority areas are listed in Table 2 (below) and are mapped in Figure 2 (page 8). In order to show the overlap between priority areas for great apes in this

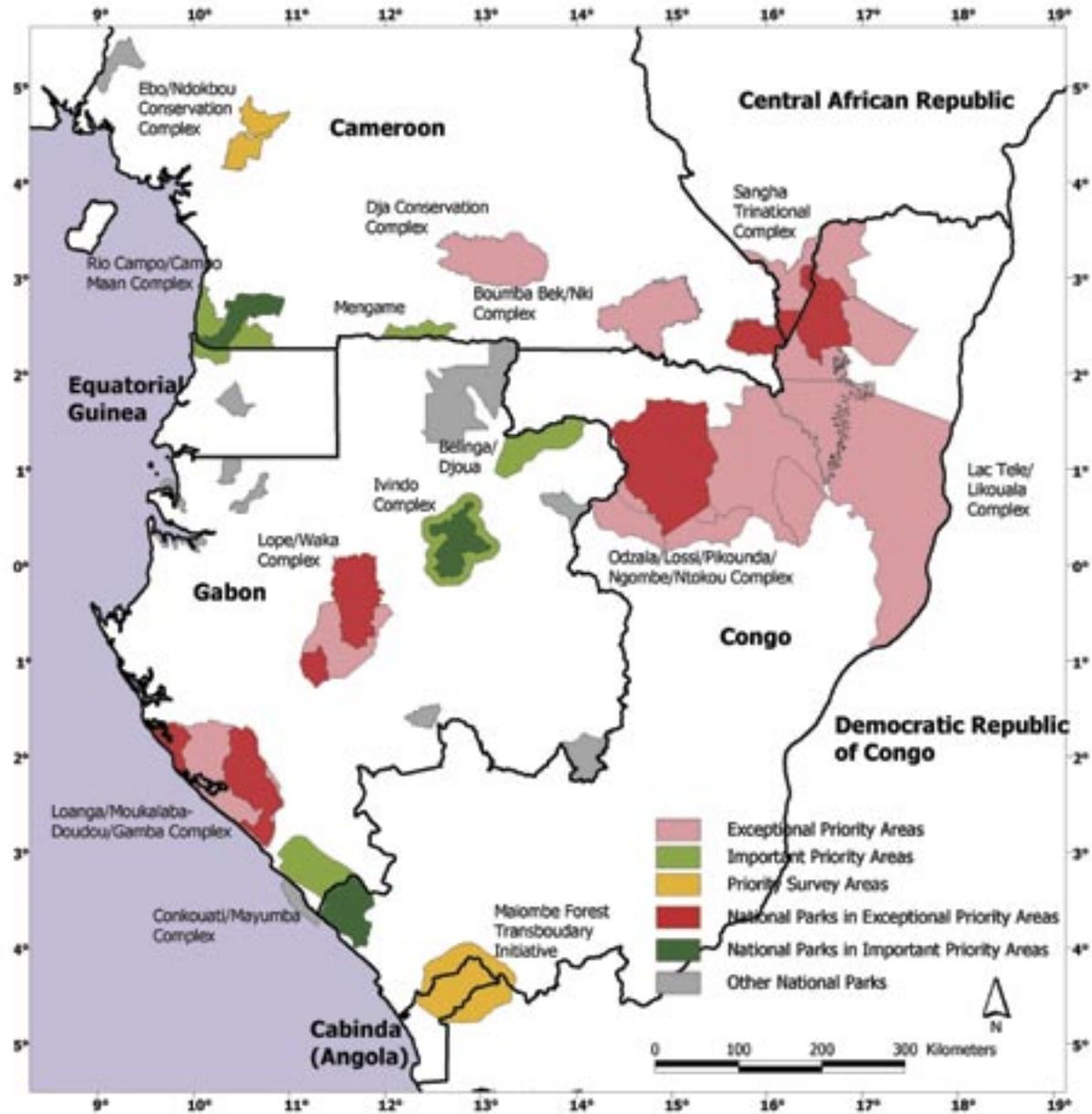
region, and priorities for biodiversity in general, Figure 3 (page 9) shows the great ape priority areas overlaid onto the CARPE Congo Basin Forest Partnership (CBFP) landscapes. There is high overlap between priority areas for great apes and priority areas for biodiversity in general. (See Fishpool and Evans 2001 for “Important Bird

Areas” in Africa.) These areas total over 150,000 km<sup>2</sup> of priority habitat for the protection of chimpanzees and gorillas in western equatorial Africa. This confirms that great apes are extremely important flagship species for conservation. Protection of priority areas for great apes also results in added protection for other species within these habitats.

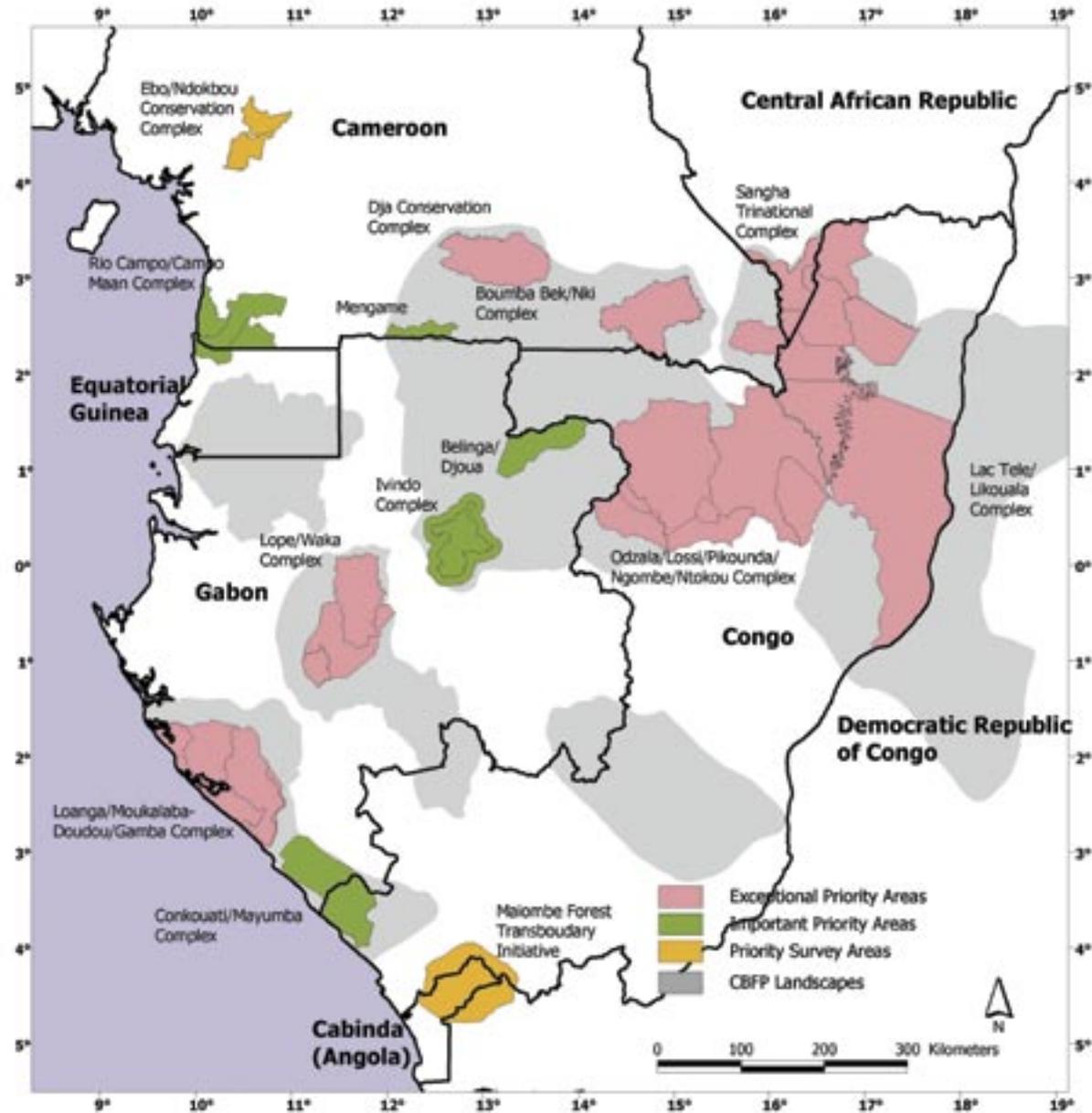
Pages 10–26 provide a more detailed description of each site, including major threats, and indicating specific activities that are needed, which partners have the capacity to implement these activities, and an estimate of how much each activity will cost.

**Table 2.** Priority areas for the conservation of chimpanzees and gorillas in western equatorial Africa as determined by consensus at the 2005 workshop in Brazzaville, Republic of Congo.

	Country	Score for estimated population size	Size of area (km <sup>2</sup> )	Score for size of area	Rank for importance of site for other taxa	Quality of population estimate
<b>Exceptional Priority Areas</b>						
Odzala/Lossi/Pikounda/Ngombe/Ntokou complex	Republic of Congo	5	41 900	5	4	4
Lac Tele/Likouala complex	Republic of Congo	5	29 545	5	4	3
Sangha Trinational complex	Cameroon/CAR/Republic of Congo	5	27 908	5	4	5
Loango/Moukalaba-Doudou/Gamba complex	Gabon	5	13 062	4	4	4
Dja Conservation complex	Cameroon	5	6 238	3	3	4
Boumba-Bek/Nki complex	Cameroon	5	6 110	3	4	3
Lopé/Waka complex	Gabon	4	10 129	4	4	3
<b>Important Priority Areas</b>						
Ivindo complex	Gabon	4	6 527	3	3	2
Rio Campo/Campo Ma'an complex	Equatorial Guinea/Cameroon	4	5 843	3	4	5
Belinga-Djoua	Gabon	4	3 453	2	4	1
Mengamé	Cameroon	4	1 219	1	4	3
Conkouati/Mayumba complex	Gabon/Republic of Congo	3	7 066	3	3	3
<b>Priority Survey Areas</b>						
Ebo/Ndokbou conservation complex	Cameroon	3	2 677	2	2	1
Maiombe Forest Transboundary Initiative	Angola/DRC/Republic of Congo	2	8 000	3	2	1



**Figure 2.** Priority areas for the conservation of chimpanzees and gorillas in western equatorial Africa as determined by consensus at the 2005 workshop in Brazzaville, Republic of Congo. Map by Stephen Blake, WCS.



**Figure 3.** Priority areas for the conservation of chimpanzees and gorillas in western equatorial Africa as determined by consensus at the 2005 workshop in Brazzaville, Republic of Congo, overlaid with the Congo Basin Forest Partnership (CBFP) landscapes. Map by Stephen Blake, WCS.

## Exceptional Priority Areas

### Odzala/Lossi/Pikounda/ Ngombe/Ntokou complex, Republic of Congo

#### Major threats to great apes:

- Ebola
- Commercial hunting
- Commercial logging



© Thomas Breuer, WCS

Forest elephants, *Loxodonta africana cyclotis*, are one of the many large and endangered mammals that share their habitat with western lowland gorillas and central chimpanzees.

THIS COMPLEX INCLUDES THE Odzala-Koukoua National Park, the proposed Lossi Sanctuary extension and a series of adjacent logging concessions, extending on their eastern side to the Sangha River, which delimits this vast landscape from the Sangha-Trinational Complex. The Odzala-Koukoua National Park covers approximately 13,500 km<sup>2</sup> and is one of the most important strongholds for elephant and gorilla conservation in Central Africa and one of the most spectacular wilderness areas in the world. The area incorporates mixed and Marantaceae forest types and an abundance of forest clearings supporting exceptional densities of a number of charismatic large mammals, including western gorillas. Unfortunately, over the past

More than 70 workshop participants agreed to classify seven sites as Exceptional Priority Areas. Protecting these sites is critical to the survival of chimpanzees and gorillas in western equatorial Africa.

three years, this region has experienced at least three outbreaks of Ebola, the most recent of which is currently threatening great ape populations within the Odzala-Koukoua National Park. Urgent attention needs to be focused on the epidemiology of this and future outbreaks and their likely impact on great ape populations, complemented by targeted research into potential control measures. Substantial ape populations likely still remain in the peripheral Ngombe, Ntokou and Pikounda forests. These forests are currently dominated by logging concessions, however, and thus Ebola-orientated activities need to be accompanied by effective law enforcement and strategic zoning plans in order to protect remaining populations from poaching.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Establish a rapid response structure</b> and systematic epidemiological surveillance system for Ebola, both before, after and during epidemics.</li> </ul>	WCS-FVP, ECOFAC, Univ. Barcelona, CIRMF, RKI, NIH, UAB, LNSP, MSPP, MEFE, WCS, Univ. Rennes	1 year	\$150,000 <sup>5</sup>
<ul style="list-style-type: none"> <li>• <b>Implement biomonitoring of ape populations</b> in zones both affected and unaffected by Ebola, in order to evaluate impact.</li> </ul>	ECOFAC, WCS, Univ. Barcelona, Univ. Rennes, MEFE	5 years	\$500,000 <sup>6</sup>
<ul style="list-style-type: none"> <li>• <b>Increase capacity in biological sampling techniques</b> and biomonitoring through targeted training programs.</li> </ul>	WCS-FVP, ECOFAC, WCS, MEFE	2 years	\$50,000
<ul style="list-style-type: none"> <li>• <b>Establish early-warning system</b> and community awareness campaign for Ebola in local community.</li> </ul>	ECOFAC, WCS-FVP, MSPP, MEFE	5 years	\$200,000
<ul style="list-style-type: none"> <li>• <b>Implement effective protection</b> for remaining ape populations through anti-poaching patrols.</li> </ul>	ECOFAC, MEFE, WCS, IFO, CIB	3 years	\$5,000,000 <sup>7</sup>

Note: See page 33 for the full names of organizations listed as acronyms.

<sup>5</sup> Start-up funding of \$45,000 already provided to Odzala National Park by USFWS Great Ape Conservation Fund

<sup>6</sup> Activity partly funded in Odzala National Park until 2006 by ECOFAC/EC “Espèces Phares” (\$32,000) and WCS/CBFP (\$20,000)

<sup>7</sup> Activity partly funded until 2006 in Odzala National Park and Ngombe by CBFP and CAWHFI

Exceptional Priority Areas, *continued*

## Lac Tele/Likouala complex, Republic of Congo

### Major threats to great apes: Subsistence and commercial hunting



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A western lowland gorilla wading through a swamp. Recent surveys conducted in the Lac Tele Community Reserve found that swamp forest supports particularly high densities of gorillas.



**N**EARLY ONE-QUARTER OF THE LAND AREA of the Congo Basin is composed of flooded swamp forest, a habitat type rarely targeted for conservation. The Lac Tele Community Reserve extends over approximately 4,500 km<sup>2</sup> of the Likouala swamps in northern Congo. It consists primarily of swamp forest with inclusions of riparian forest and mixed-species lowland forest on *terra firma* islands and savanna patches. The Lac Tele Community Reserve is one of only two central African protected areas that seek to conserve swamp forest habitat (and the only area within the range of the apes under consideration). Swamp forest

has been found to be ecologically very important for great apes, and supports large populations of western gorillas in particular. Furthermore, swamp forests that are intact, ecologically functioning, and supporting a variety of endemic and wetland dependent species are unlikely to be logged. The relative inaccessibility of swamp forests limits resource extraction and may also constitute a barrier to the spread of disease, including Ebola. The Lac Tele Community Reserve and its surroundings therefore provide an unusual safe haven for both plant and animal species that are threatened elsewhere.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Support government agents and local communities</b> in promoting and implementing great ape protection efforts in and around the Lac Tele Community Reserve.</li> </ul>	WCS, MEFE, CFC	3 years	\$450,000 <sup>8</sup>
<ul style="list-style-type: none"> <li>• <b>Conduct baseline ape surveys</b> in the Likouala and Baille swamps to the southeast and west of Lac Tele Community Reserve to assess great ape populations.</li> </ul>	WCS, MEFE, CFC	1 year	\$50,000 <sup>9</sup>
<ul style="list-style-type: none"> <li>• <b>Standardize protocols for training and implementation</b> of biomonitoring program for great ape populations.</li> </ul>	WCS, MEFE	5 years	\$100,000 <sup>10</sup>
<ul style="list-style-type: none"> <li>• <b>Establish systematic surveillance systems</b> for the emergence of zoonotic diseases in great ape populations.</li> </ul>	WCS, MEFE, WCS-FVP, CIRMF, RKI, MSPP, LNSP	1 year	\$25,000

<sup>8</sup> Activity partly funded in the Lac Tele Community Reserve until 2006 by CBFP

<sup>9</sup> Activity partly funded in the Baille swamps by USFWS Great Ape Conservation Fund

<sup>10</sup> Activity partly funded in the Lac Tele Community Reserve until 2006 by CBFP

Exceptional Priority Areas, *continued*

**Sangha Trinational complex, Republic of Congo, Cameroon and Central African Republic**

**Major threats to great apes:**

- Commercial hunting
- Commercial logging
- Artisanal mining



© David Wilkie, WCS

Processed timber ready for export out of northern Congo and into European markets.

.....→ **T**HE SANGHA TRINATIONAL COMPLEX IS over 25,000 km<sup>2</sup> of contiguous lowland tropical rain-forest that is of critical biological significance. Biodiversity is partially protected in three national parks: the Lobéké National Park in Cameroon, Dzanga-Ndoki National Park in Central African Republic and the Nouabalé-Ndoki National Park in the Republic of Congo, that together support one of the most pristine blocks of protected forest in Central Africa. It is home to one of the largest remaining populations of gorillas and chimpanzees on the continent, and also harbors significant populations of other endangered large mammal species including forest elephants and

bongo *Tragelaphus euryceros*. The remaining landscape is dominated by forestry concessions, which have seen the rapid expansion of commercial timber exploitation across the region over the last two decades. In the Republic of Congo, sustainable wildlife management programs are currently being carried out in 1.8 million ha of production forest — and potential ape habitat — surrounding the Nouabalé-Ndoki National Park. The Sangha Trinational is not only a regionally and globally important area for wildlife, it holds great potential for assessing and enhancing the effectiveness of transboundary and collaborative approaches to conservation.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Develop an epidemiological surveillance system</b> and rapid response structure for the emergence of zoonotic diseases, specifically Ebola.</li> </ul>	CIRMF, MSPP, NIH, RKI, UAB, WCS, WCS-FVP, WWF, MINSANTE, LNSP, MINFOF, MINEPN, CPC	1 year	\$150,000 <sup>11</sup>
<ul style="list-style-type: none"> <li>• <b>Improve judicial and law enforcement structures</b> in protected areas and timber concessions, including capacity building, monitoring systems, and promotion of wildlife protection laws in logging concessions.</li> </ul>	MINEEFCP, MEFE, MINFOF, MINEPN, WCS, WWF, Timber companies (e.g., CIB, Delcolvenare, STBK, Grumcam, SEBAC, etc.)	3 years	\$4,350,000 <sup>12</sup>
<ul style="list-style-type: none"> <li>• <b>Standardize protocols for training and implementation</b> of biomonitoring programs for great ape populations.</li> </ul>	WCS, WWF, MEFE, MINFOF, MINEPN, MINEEFCP	5 years	\$375,000 <sup>13</sup>
<ul style="list-style-type: none"> <li>• <b>Develop and promote national and transboundary structures</b> for great ape ecotourism in the Nouabalé-Ndoki, Dzanga and Lobéké National Parks.</li> </ul>	GTZ, WCS, WWF, MINTOUR, MEFE, MINFOF, MINEPN, MINEEFCP, private tour operators	3 years	\$250,000 <sup>14</sup>

<sup>11</sup> Start-up funding of \$45,000 already provided to the TNS by USFWS Great Ape Conservation Fund, and \$10,000 available for veterinary salaries from WWF

<sup>12</sup> Activity partly funded until 2006 by CBFP and CAWHFI

<sup>13</sup> Activity partly funded until 2006 by WWF, WCS, CBFP and USFWS Elephant Conservation Fund (for biomonitoring programs for elephant and ape population)

<sup>14</sup> \$10,000 WWF funds available for Central African Republic/Cameroon Sector

Exceptional Priority Areas, *continued*

## Loango/Moukalaba-Doudou/ Gamba complex, Gabon

### Major threats to great apes:

- Commercial hunting
- Oil exploitation
- Subsistence hunting



© Nick Nichols, NGS

Ba'aka hunter-gatherers practicing traditional subsistence techniques have existed in parts of western equatorial Africa for centuries.

.....→ **T**HIS LARGE AREA COVERS 12,230 km<sup>2</sup> of the south west of Gabon and includes two national parks; Loango (1,550 km<sup>2</sup>) and Moukalaba-Doudou (4,496 km<sup>2</sup>). The variety of landscapes — forests, savannas, mangroves, lagoons and beaches — create the astounding natural beauty of the area and make it a prime area for ecotourism with several initiatives underway already. Elephants, hippopotamus *Hippopotamus amphibius*, buffalo *Syncerus caffer* and gorillas can be seen on the beaches, and crocodiles in the lagoons. Gorillas and chimpanzees occur throughout the site and Mt. Doudou

has the highest recorded density of gorillas in Gabon. Research on apes, including habituation of groups is underway at several areas. The direct environmental impacts of oil extraction have been minimized but diminishing oil production and subsequent unemployment present a threat of increased poaching. Eco-tourism has been identified as a tool for sustainable development, and the potential for gorilla viewing is under investigation. It is of vital importance to maintain and reinforce the protection of the large ape populations that remain at this site.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Reinforce anti-poaching measures throughout the site</b> especially on logging concessions in the buffer zones.</li> </ul>	DFC, WCS, WWF, CNPN	2 years	\$1,200,000 <sup>15</sup>
<ul style="list-style-type: none"> <li>• <b>Introduce measures to minimize risks of disease transmission</b> and establish health-monitoring systems for apes, rules for all people using the site, education for villagers and tourists, and analysis of ape fecal samples.</li> </ul>	WCS-FVP, WWF, CNPN, DFC, MPI-EVA	3 years	\$450,000 <sup>16</sup>
<ul style="list-style-type: none"> <li>• <b>Develop and promote responsible great ape tourism</b> within the broader ecotourism strategy for this site.</li> </ul>	CNPN, SCD, MPI-EVA, SCS, PSVAP, WWF, WCS	5 years	\$200,000 <sup>17</sup>
<ul style="list-style-type: none"> <li>• <b>Strengthen research capacity to respond to threats to apes</b>, integrate research into site management, provide support in training, data collection and analysis, and applied protocols.</li> </ul>	SI, University of Kyoto, MPI-EVA, WCS, WWF, CNPN, CMP	5 years	\$250,000 <sup>18</sup>
<ul style="list-style-type: none"> <li>• <b>Maintain ape biomonitoring program</b>, including training in monitoring methods for research personnel.</li> </ul>	WCS, WWF, DFC, University of Kyoto, MPI-EVA, CNPN, CMP	1 year	\$100,000 <sup>19</sup>

<sup>15</sup> Partial funding through CAWFHI and WWF core funding with \$200,000 available for 2006

<sup>16</sup> Partial funding through CARPE (\$50,000 for 2006) and SCD for education campaigns

<sup>17</sup> Partial funding through CARPE with \$15,000 for 2006

<sup>18</sup> Partial funding through CARPE, WWF core funding and CMP with \$10,000 available for 2006

<sup>19</sup> Partial funding through CARPE (\$50,000)

Exceptional Priority Areas, *continued*

**Dja Conservation complex, Cameroon**

**Major threats to great apes:**

Commercial hunting

Commercial logging

Habitat fragmentation <sup>20</sup>



© Kent Redford, WCS

A logging road stretches alongside a small camp constructed for logging employees. Commercial logging is a major indirect threat to great ape populations because it provides access to remote intact forests, and the means for taking bushmeat to distant markets.

→ **T**HE DJA CONSERVATION COMPLEX CONSISTS of the Dja Biosphere Reserve (5,260 km<sup>2</sup>) and the surrounding mosaic of logging concessions, community forests, agro-forestry zones, and even a mining concession. The area, both protected and unprotected, is home to significant populations of chimpanzees, gorillas, forest elephants *Loxodonta africana cyclotis* and leopards *Panthera pardus*, and high densities of indicator species such as mangabeys, colobus and yellow-backed duikers. Hunting pressure is high, both for

subsistence and commercial trade in this area. A range of participatory approaches to conservation have been set up in and around the Dja Biosphere Reserve, focusing on community forestry, civil society capacity building and on the sustainable use of natural resources, including commercial forestry. In 2003, a management plan for the Dja Biosphere Reserve was agreed upon which focuses on the involvement of local stakeholders and which aims to build upon and synergize past and present conservation activities.

Action Needed <sup>21</sup>	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>Establish and maintain basic management infrastructure in the Dja Conservation complex.</li> </ul>	FFI, MINFOF, ECOFAC	5 years	\$625,000
<ul style="list-style-type: none"> <li>Recruitment, training and functioning of 50 extra ecoguards for law enforcement activities.</li> </ul>	MINFOF, ECOFAC	5 years	\$725,000
<ul style="list-style-type: none"> <li>Reactivate and maintain permanent great ape research areas throughout the area.</li> </ul>	MINFOF, ECOFAC, PGS/IRAD, Nature+	5 years	\$240,000
<ul style="list-style-type: none"> <li>Establish great ape monitoring and survey program across complex.</li> </ul>	MINFOF, ECOFAC, PGS/IRAD, Nature+, Logging and mining co. (R. Pallisco, Fip. cam, Geovic), Bristol Zoo/CIAD	5 years	\$200,000
<ul style="list-style-type: none"> <li>Establish a disease surveillance program and rapid response structure specifically for great apes (with focus on Ebola and Anthrax).</li> </ul>	MINFOF, PRESIDIA, Johns Hopkins Institute, PGS, Nature+	5 years	\$275,000
<ul style="list-style-type: none"> <li>Establish community-based biodiversity enterprises to support ape habituation and community-based ecotourism.</li> </ul>	MINFOF, PMDA, Bristol Zoo/CIAD/FFI, PGS/IRAD, Nature+	5 years	\$250,000

<sup>20</sup> Habitat fragmentation is the creation of barriers to the movement of apes and to gene flow, which divides populations into smaller units increasing the vulnerability to extinction usually linked to construction of roads and railways.

<sup>21</sup> Partial funding (30%) already secured from European Union and WWF-Nature+

Exceptional Priority Areas, *continued*

## Boumba-Bek/Nki complex, Cameroon

### Major threats to great apes:

Commercial hunting

Commercial logging

Illegal trafficking of military weapons



© David Greer, WWF

Illegal arms confiscated from poachers by ecoguard patrols. Commercial hunting is the greatest threat to great apes throughout their range in western equatorial Africa.

•.....▶ **W**ITH OVER 8,000 KM<sup>2</sup> IN TOTAL, the proposed national parks of Boumba-Bek and Nki constitute the largest contiguous block of protected forest in Cameroon. The area is characterised by intact lowland rainforest harboring significant populations of large mammals, including forest elephants, gorillas and chimpanzees. Its relative isolation from traditional population settlements has thus far ensured a certain degree of protection for its wildlife populations. However, the zone is currently surrounded by commercial forestry concessions. The presence of mineral exploitation and a national road to its northern periphery pose a consid-

erable threat to ape populations and other wildlife as a result of commercial hunting and human encroachment. In spite of the delay in its official legal status, the zone has already profited from a considerable participatory management presence and infrastructure through the support of a prior GEF project grant. Current schemes are now seeking to solidify the management presence of the newly classified national parks, and to develop community-based activities in the buffer zone of the two protected areas. The area forms part of the vast TRIDOM landscape, which will assist in catalysing cross-border protection efforts in particular.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>Finalize legal status of both National Parks.</li> </ul>	MINFOF, WWF	1 year	\$10,000 <sup>22</sup>
<ul style="list-style-type: none"> <li>Establish and implement effective law enforcement program, including recruitment and training of 100 ecoguards and annual transboundary patrols with Odzala National Park.</li> </ul>	MINFOF, WWF, ECOFAC, MEFE	5 years	\$1,700,000 <sup>23</sup>
<ul style="list-style-type: none"> <li>Maintain annual ape biomonitoring program.</li> </ul>	MINFOF, WWF	5 years	\$450,000 <sup>24</sup>
<ul style="list-style-type: none"> <li>Establish a disease-monitoring program specifically for great apes given geographical proximity of recent Ebola outbreaks.</li> </ul>	MINFOF, WWF	5 years	\$375,000
<ul style="list-style-type: none"> <li>Establish collaborative framework with all stakeholders in support of great ape conservation, while developing management plan.</li> </ul>	MINFOF, WWF	5 years	\$100,000 <sup>25</sup>

<sup>22</sup> Activity partially funded by CAWHFI (\$1,500)

<sup>23</sup> Activity partially funded by CAWHFI (\$25,000)

<sup>24</sup> Activity partially funded by CBFP and WWF (\$30,000)

<sup>25</sup> Activity partially funded by WWF (\$30,000)

Exceptional Priority Areas, *continued*
**Lopé/Waka complex, Gabon**
**Major threats to great apes:**

Commercial hunting

Commercial logging

Disease



© Fiona Maisels, WCS

A Gabonese researcher practises using a compass in the Lopé savannas. Training national researchers in field techniques is essential in developing capacity for monitoring ape populations.

.....→ **T**HIS SITE COVERS ALMOST **12,000 km<sup>2</sup>** including the Lopé and Waka National Parks and a proposed corridor between them where selective logging will occur. The habitat is mostly lowland tropical forest, with Marantaceae Forest around the savanna/gallery forest mosaic in the northern part of Lopé National Park. The site includes mountainous areas and the diverse flora bears witness to a dynamic history of climate-induced shifts in vegetation. The dramatic and varied landscapes combined with relative ease of access to the northern parts of Lopé National

Park make it a prime site for the development of eco-tourism as, in addition to large mammals and a diverse avifauna, there are abundant archeological sites dating back 400,000 years. A long history of multi-disciplinary research and strong links to national research institutions makes this an excellent site for innovation in applied research, training and capacity building. Populations of great apes appear to have declined in the past two decades but the site holds great potential if it can be effectively protected from commercial hunting.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Extend existing programs of health education and ape health monitoring</b> to minimize risks of disease transmission between humans and apes.</li> </ul>	WCS-FVP, CIRMF, ZSL, DFC, ECOFAC, CNPN	5 years	\$250,000 <sup>26</sup>
<ul style="list-style-type: none"> <li>• <b>Support research &amp; training programs and improve capacity for adaptive management</b>, through focused research protocols and systems to evaluate the effectiveness of management for the protection of apes.</li> </ul>	WCS, CIRMF, ZSL, USTM, ENEF, CNPN, ECOFAC	5 years	\$250,000 <sup>27</sup>
<ul style="list-style-type: none"> <li>• <b>Standardize and refine protocols for training and implementation of monitoring programs</b> for great ape populations.</li> </ul>	WCS, CIRMF, DFC, ECOFAC, CNPN, ZSL	5 years	\$150,000
<ul style="list-style-type: none"> <li>• <b>Improve judicial and law enforcement capacity</b> in protected areas and logging concessions, including mobile anti-poaching brigade, specialized training for local authorities, gendarmes and magistrates.</li> </ul>	CNPN, DFC, WCS, ECOFAC, USFWS	3 years	\$ 160,000 <sup>28</sup>
<ul style="list-style-type: none"> <li>• <b>Develop and promote responsible great ape tourism</b>, of already habituated gorilla groups and within the broader ecotourism strategy for this site.</li> </ul>	ZSL, CNPN, ECOFAC and private operators	5 years	\$ 500,000 <sup>29</sup>

<sup>26</sup> Partial funding from CARPE (\$50,000), potential funding from EU (ECOFAC Phase IV)

<sup>27</sup> Existing work funded by TOTAL-Gabon & CARPE (\$50,000), potential funding from EU (ECOFAC Phase IV)

<sup>28</sup> Partial funding from USFWS & CARPE (\$60,000), potential funding from EU (ECOFAC Phase IV)

<sup>29</sup> Partial funding of \$300,000 from EU (PSVAR, Espèces Phares), FFEM and ZSL

## Important Priority Areas

Workshop participants agreed to classify the following five sites as Important Priority Areas.

### Ivindo complex, Gabon

#### Major threats to great apes:

Commercial hunting

Commercial logging



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Training Gabonese researchers in survey techniques. The vast areas of potential ape habitat in western equatorial Africa, combined with the difficulty of observing apes in the wild, means that surveys typically use indices of ape presence—such as nest counts—to estimate their numbers.

THIS NATIONAL PARK CREATED IN 2002, covers an area of just over 3,000 km<sup>2</sup> along the Ivindo river in north-east Gabon, and the additional area of this priority site for ape conservation consists of commercial logging concessions surrounding the Park. The waterfalls on the Ivindo river, south-west of the town of Makokou are among the most spectacular in Africa and, with the opportunities of viewing gorillas and elephants at Langoué Bai in the heart of the Park, this site holds potential for adventurous ecotourism.

With a long tradition of research in tropical ecology, the recently renovated IRET field station close to Makokou, in the extreme north of the Park, is an ideal base for continued documentation and monitoring of the fauna and flora of lowland tropical rainforests. Populations of great apes may have declined in the past decade and surveys are urgently needed, but the site holds enormous potential for great ape conservation if it can be effectively protected from commercial hunting.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>Extend existing programs of health education and ape health monitoring to minimize risks of disease transmission between humans and apes.</li> </ul>	WCS-FVP, CIRMF, DFC, CNPN	5 years	\$250,000 <sup>30</sup>
<ul style="list-style-type: none"> <li>Develop and promote responsible great ape ecotourism at Langoué Bai from viewing platforms, and other appropriate areas within the broad ecotourism strategy for Gabon's National Park network.</li> </ul>	CNPN, WCS, FIGET, private sector	3 years	\$500,000 <sup>31</sup>
<ul style="list-style-type: none"> <li>Develop on-site research capacity on great ape ecology, behavior and health, through support to the IRET research station.</li> </ul>	IRET/CENAREST, CIFOR, WCS-FVP, CIRMF, PSVAP	5 years	\$250,000 <sup>32</sup>
<ul style="list-style-type: none"> <li>Sustain partnerships with logging companies in the buffer zone to reinforce the protection of apes and increase capacity to monitor population trends.</li> </ul>	WCS, WWF, FRM, CNPN, Rougier	5 years	\$1,050,000 <sup>33</sup>
<ul style="list-style-type: none"> <li>Maintain ape biomonitoring program, including training in monitoring methods for research personnel.</li> </ul>	WCS, IRET/CIFOR, DFC, CNPN, PSVAP	5 years	\$175,000 <sup>34</sup>

<sup>30</sup> Partial funding of \$50,000 from WCS

<sup>31</sup> Partial funding of \$50,000 from WCS, CARPE

<sup>32</sup> Partial funding from CARPE, WCS, EU (PSVAP)

<sup>33</sup> Partial funding from CARPE and WWF

<sup>34</sup> Partial funding of \$75,000 from WCS, CARPE

Important Priority Areas, *continued*

**Rio Campo/Campo Ma'an complex, Cameroon, Equatorial Guinea**

**Major threats to great apes:**

Commercial hunting

Habitat destruction due to development projects



© Jeffrey Donk & Marleen Azink, Foto Natura

A female gorilla hand-claps in response to observers. The function of this behavior is not fully understood, but may be a method of communicating to others in the group.



**T**HIS TRANSBOUNDARY COMPLEX, including the Rio Campo Reserve (335 km<sup>2</sup>) in Equatorial Guinea and the adjacent Campo Ma'an National Park (2,640 km<sup>2</sup>) in Cameroon, is situated in the Atlantic Coastal Forest zone and contains a remarkable biodiversity, including a significant population of gorillas, chimpanzees and mandrills, and a rich floral diversity including several endemic species. The Campo area was also the site of extensive ecological research on gorillas in the late 1970s/early 1980s. In spite of a comprehensive protected area system in Equatorial Guinea, there is currently little management capacity or resources allocated to protected areas and their buf-

fer zones. The Campo Ma'an National Park has been the focus of international attention due to its selection as a compensation site for the Chad-Cameroon Pipeline construction. At present, the Park is surrounded by agro-forestry zones and logging concessions. Of principal concern is the project for a hydroelectric dam on its periphery. In spite of the existence of a minimal management presence inside the national park, protection efforts and collaborative reduced-impact projects with developers are urgently needed. Establishing a transboundary initiative between the two countries may provide a promising conduit for channeling support for conservation activities.

Action Needed <sup>35</sup>	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Implement law enforcement and disease surveillance program</b>, including recruitment and training of 50 ecoguards.</li> </ul>	FEDEC, WWF, MINFOF, Projet Hydroélectrique de Memvélé, PNDP, Opérateurs Economiques, INDEFOR	5 years	\$750,000
<ul style="list-style-type: none"> <li>• <b>Establish and maintain basic management infrastructure</b> in Rio Campo.</li> </ul>	INDEFOR	3 years	\$450,000
<ul style="list-style-type: none"> <li>• <b>Establish framework for collaboration between the governments</b> of Equatorial Guinea and Cameroon with emphasis on transboundary conservation action initiative.</li> </ul>	INDEFOR, MINFOF	1 year	\$10,000
<ul style="list-style-type: none"> <li>• <b>Establish and maintain a biomonitoring program for great apes.</b></li> </ul>	FEDEC, WWF, MINFOF, INDEFOR	5 years	\$250,000
<ul style="list-style-type: none"> <li>• <b>Explore ecotourism potential</b> — conduct a feasibility study with great ape viewing options.</li> </ul>	FEDEC, WWF, MINFOF, INDEFOR	1 year	\$70,000
<ul style="list-style-type: none"> <li>• <b>Develop and sustain platform for collaboration between stakeholders about logging issues.</b></li> </ul>	FEDEC, WWF, MINFOF, INDEFOR, Projet Hydroélectrique de Memvélé, PNDP, Opérateurs Economiques	5 years	\$50,000

<sup>35</sup> Activities partially funded (30%) by FEDEC, Offield Family Foundation, PNDP, WWF and UICN for Cameroon sector only.

Important Priority Areas, *continued***Belinga-Djoua, Gabon****Major threats to great apes:**

Mineral exploitation

Ebola

Commercial hunting



© Nick Nichols, NGS

Gold mining in Gabon. Commercial and artisanal mining (i.e., non-industrialized and small-scale) for gold, iron and other minerals create direct and indirect threats to great apes due to habitat destruction and an increase in commercial hunting through the development of access routes, and local human population growth.



**T**HIS SITE IN NORTH-EAST GABON IS IMPORTANT for ape conservation but threats will increase very significantly in the near future as iron reserves at Belinga are mined and a railway built to export the ore to Libreville. It is crucial to act now to minimize negative impacts of this major development project on apes in particular and the environment in general. The flora and fauna of the site are relatively well documented due to research conducted since the 1960s (CNRS, IRET, CIRMF). Gorillas and chimpanzees were relatively common in the 1980s, but, as the site has no legal status, poaching has become an increasing problem. The impact of Ebola on ape popula-

tions in this area is not well understood but human epidemics have occurred in nearby villages and are known to have originated from handling infected ape carcasses. Preliminary surveys have shown that apes remain, and documenting their distribution and density in this site will add to understanding of Ebola epidemics. As part of the vast TRIDOM trans-boundary protected area complex being developed by Gabon, Cameroon and Congo, this site requires urgent attention through surveys, protection and evaluation of legal status. The inevitable increase in human settlement must be carefully planned to avoid fragmentation of the habitat block.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Surveys of ape distribution and density throughout the site</b>, including training in monitoring methods for research personnel.</li> </ul>	WWF, DFC, IRET, WCS, CNPN	2 years	\$100,000 <sup>36</sup>
<ul style="list-style-type: none"> <li>• <b>Measures to prevent fragmentation of ape habitat block</b>, by prevention of new human settlements and deforestation along the Zadio-Belinga road.</li> </ul>	Assemblée Departementale de l'Ivindo, DFC, CNPN, WWF	1 year	\$50,000 <sup>37</sup>
<ul style="list-style-type: none"> <li>• <b>Raising awareness of the need for ape conservation</b> among local actors and organizations with anti-poaching missions.</li> </ul>	DFC, CNPN, WWF	1 year	\$75,000 <sup>38</sup>
<ul style="list-style-type: none"> <li>• <b>Creation of a great ape sanctuary within the TRIDOM landscape</b>, based on survey results.</li> </ul>	CNPN, DFC, WWF	1 year	\$40,000 <sup>39</sup>
<ul style="list-style-type: none"> <li>• <b>Applied epidemiological research on Ebola</b>, collection of fecal samples and autopsies of cadavers to assess impact of past Ebola epidemics and current health status of ape populations.</li> </ul>	CIRMF, WCS-FVP, GRAET	2 years	\$100,000

<sup>36</sup> Receives partial funding of \$20,000 through CARPE/WWF

<sup>37</sup> Receives partial funding of \$10,000 through CARPE/WWF

<sup>38</sup> Receives partial funding of \$10,000 through CARPE/WWF

<sup>39</sup> Receives partial funding of \$10,000 through CARPE/WWF

Important Priority Areas, *continued*

**Mengamé, Cameroon**

**Major threats to great apes:**

Commercial hunting

Subsistence hunting

Habitat destruction due to agriculture



© David Greer & Chloe Cippolletta, WWF

A silverback gorilla feeds on herbaceous vegetation, an important dietary component, particularly during times when ripe fruits are scarce.



**T**HE PROPOSED MENGAMÉ GORILLA SANCTUARY lies on the southern Cameroon-Gabon border and extends over an approximate area of 1,200 km<sup>2</sup>. To the north, the sanctuary is surrounded by multiple-use forests, including commercial forestry concessions, and partially protected forested reserves. Recent surveys suggest the presence of significant populations of great apes; gorillas in particular. However, pressures from local communities on the periphery of the Sanctuary, including habitat fragmentation, due to subsistence agriculture, and hunting, now threaten these

remaining populations. Furthermore, commercial logging enterprises to the north of the Sanctuary threaten to encroach further and increase human access and commercial hunting. These problems are further compounded by the lack of legal status and defined limits of the proposed protected area. An effective protection presence and community-based sensitization programs are therefore urgently needed. The proposed sanctuary forms an integral part of the TRIDOM landscape and therefore has considerable potential to profit from existing and future cross-border protection activities.

Action Needed <sup>40</sup>	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>Formalize legal status of gorilla sanctuary.</li> </ul>	MINFOF, WWF	1 year	\$10,000
<ul style="list-style-type: none"> <li>Establish and implement effective law enforcement and community sensitization program, including recruitment and training of 30 ecoguards and initiation of cross-border protection activities.</li> </ul>	MINFOF, WWF	5 years	\$580,000
<ul style="list-style-type: none"> <li>Develop and sustain great ape–human conflict mitigation strategy.</li> </ul>	MINFOF, WWF	5 year	\$250,000
<ul style="list-style-type: none"> <li>Implement disease-monitoring program (given geographical proximity to past Ebola outbreaks).</li> </ul>	MINFOF, WWF	5 years	\$375,000
<ul style="list-style-type: none"> <li>Maintain ape biomonitoring program and reinforce survey database.</li> </ul>	MINFOF, WWF	5 years	\$125,000
<ul style="list-style-type: none"> <li>Develop community mobilization strategy in support of great ape conservation.</li> </ul>	MINFOF, WWF	1 year	\$100,000

<sup>40</sup> Partial funding available from ITTO

Important Priority Areas, *continued***Conkouati/Mayumba complex,  
Republic of Congo, Gabon****Major threats to great apes**

Commercial hunting

Commercial logging

Artisanal mining



© Nick Nichols, NGS

The transport of game in logging vehicles is one of the important factors contributing to the rapid growth of the commercial bushmeat trade.

•.....→ **T**HE CONKOUATI/MAYUMBA COMPLEX includes the Conkouati-Douli National Park and a considerable transboundary buffer zone that extends across the Republic of Congo and Gabon towards the Mayumba National Park (predominately marine with a 60 km<sup>2</sup> protected terrestrial zone). It offers a unique ecological series that begins in the Atlantic Ocean marine coastal waters, passes eastward through forested lowlands and mountains, and descends to the inland savanna plain. The Conkouati-Douli National Park covers 5,045 km<sup>2</sup>, and has the highest habitat and species diversity of any protected area in the Congo. Together with the Mayumba National Park, these beaches probably have the largest nesting population of leatherback turtles in the world. The Conkouati-

Douli National Park terrestrial zone extends over 3,500 km<sup>2</sup> and contains significant populations of forest elephant, western lowland gorillas and chimpanzees. Unusually high densities of chimpanzees are found in Conkouati, as they are strongly protected by local tradition. The swampy and mountainous terrain of the transboundary forests peripheral to the Mayumba and Conkouati-Douli National Parks offers some natural protection from commercial logging activities. However, the lack of hunting controls and law enforcement in these buffer zones, coupled with considerable demand for bushmeat from urban markets in Congo, present a serious threat both inside and outside the two protected areas, and urgent cross-border protection efforts are needed.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Develop capacity and structures for an effective law enforcement and judiciary process</b> in the Conkouati-Douli National Park and surrounding buffer zones, including training of park guards and transboundary protection efforts and policies.</li> </ul>	WCS, MEFE, MEFEPE	3 years	\$900,000 <sup>41</sup>
<ul style="list-style-type: none"> <li>• <b>Construct a great ape research and training station</b> within the Conkouati-Douli National Park, to conduct effective and timely biomonitoring and provide effective deterrent to poaching.</li> </ul>	WCS, MEFE	1 year	\$75,000
<ul style="list-style-type: none"> <li>• <b>Conduct baseline surveys of ape populations</b> and other large mammals in Conkouati-Douli National Park, and Mayumba National Park buffer zone.</li> </ul>	WCS, MEFEPE, MEFE, HELP-Congo	1 year	\$50,000
<ul style="list-style-type: none"> <li>• <b>Establish systematic surveillance systems for the emergence of zoonotic diseases.</b></li> </ul>	WCS, MEFE, WCS-FVP, CIRMF, RKI, MSPP, LNSP, HELP-Congo	1 year	\$25,000
<ul style="list-style-type: none"> <li>• <b>Implement conservation education awareness and outreach programs</b> in local communities, with specific emphasis on great apes.</li> </ul>	WCS, MEFE	5 years	\$100,000

<sup>41</sup> Activity partly funded for CDNP until 2006 by CBF

## Priority Survey Areas

### Ebo/Ndokbou conservation complex, Cameroon

**Major threats to great apes:**

- Commercial hunting
- Commercial logging and road development



© Kent Redford, WCS

A logging road opens up previously inaccessible forest blocks and facilitates the transport of bushmeat from remote forested areas to urban markets.

**T**HE EBO/NDOKBOU FOREST IS ONE OF the largest intact forests remaining in Cameroon. Stretching over 2,500 km<sup>2</sup> and ranging in elevation from below 100 to well over 1000 m, it consists of a series of steep valleys with rocky outcrops. It has a unique primate fauna with ten diurnal primate species including a significant chimpanzee *Pan troglodytes vellerosus* population and perhaps the largest population of drills *Mandrillus leucophaeus* remaining anywhere. A population of gorillas of uncertain taxonomic affinity is also

Workshop participants agreed to classify the following two sites as Priority Survey Areas.

present, and urgent steps need to be taken to survey and protect what is likely to be a very small population. The Ebo forest has been proposed by the Government of Cameroon as a national park but gazettelement is not yet complete. The Ndokbou forest is currently a large-scale logging concession. Protecting this area's habitat will not only ensure the survival of many endangered primate, mammal and plant species, but also contribute to the protection of biodiversity in this important area of the Cameroon Coastal forests.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>Formalize protected area recognition and legal status for the Ebo forest, which is currently proposed as a national park by the Government of Cameroon.</li> </ul>	WWF Coastal Forests Program	2 years	\$30,000
<ul style="list-style-type: none"> <li>Conduct thorough surveys of ape populations in (1) the Ebo forest<sup>42</sup> and (2) the Ndokbou concession, followed by long-term monitoring.</li> </ul>	WWF Coastal Forests Program (1 and 2), Zoological Society of San Diego (1)	1) 3 years 2) 3 years	1) \$120,000 2) \$120,000
<ul style="list-style-type: none"> <li>Implement effective law enforcement and disease surveillance systems, including infrastructure, recruitment and training of 30 ecoguards.</li> </ul>	WWF Coastal Forests Program	5 years	\$830,000
<ul style="list-style-type: none"> <li>Carry out a public education and awareness program to build support for great ape conservation at local and national levels.</li> </ul>	WWF Coastal Forests Program	3 years	\$140,000

<sup>42</sup> Initial survey work in the Ebo forest has been funded by the Zoological Society of San Diego's Center for Conservation and Research in Endangered Species, the USFWS Great Ape Conservation Fund and the Margot Marsh Biodiversity Foundation

## Maiombe Forest Transboundary Initiative, Republic of Congo, Democratic Republic of Congo

### Major threats to great apes:

Commercial and subsistence hunting  
Illegal mining and logging  
Armed conflict



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A juvenile gorilla plays in a tree. Many infants are not so lucky and are confiscated as pets after their mothers die as accidental victims of the bushmeat trade.

•.....► **T**HE MAIOMBE FOREST FORMS THE SOUTH-WEST margin of the Congo Basin's tropical rainforest and the geographical limits of several forest-dwelling species, including central chimpanzees and western gorillas. A transfrontier initiative for the conservation of the Maiombe Forest focuses on its southern sector, between DRC, Angola, and Republic of Congo. This zone incorporates the Dimoneka and Luki Biosphere Reserves in Republic of Congo and DRC, respectively. In spite of little or no protection efforts in these reserves, coupled with high human populations, illegal exploitation activities and decades of, as yet

unresolved, political and economic instability, local reports suggest that significant ape populations, particularly chimpanzees, may remain. Community-based conservation measures have been seeking to build support for a 2,000 km<sup>2</sup> zone of the Maiombe Forest in Cabinda, Angola. Information on ape status in the Maiombe Forest is scarce, and much-needed survey efforts have been hampered by civil unrest. Ape surveys in this transfrontier region would also confirm the presence and status of western gorillas in DRC and build political support for transboundary conservation efforts in the three countries.

Action Needed	Potential Partners	Timeframe	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Conduct ape population surveys</b> in the Maoimbe Forest in Cabinda, DRC, and Congo Republic, to include ape counts, habitat status and collection of genetic material.</li> </ul>	IDF, MINUA, GPC, NORAD, UNDP, CABGOC, DFID, MINADER, MEFE, MFE, MAE, Gremio ABC, CIRMF	2 years	\$200,000
<ul style="list-style-type: none"> <li>• <b>Provide training for local community participants and research personnel</b> in ape census field methodology and community-based law enforcement.</li> </ul>	IDF, MINUA, GPC, NORAD, UNDP, CABGOC, DFID, MINADER, MEFE, MFE, MAE, Gremio ABC	8 months	\$100,000
<ul style="list-style-type: none"> <li>• <b>Conduct socio-economic surveys on bushmeat market trade,</b> hunting pressure and local attitudes to conservation in the Maiombe Forest.</li> </ul>	IDF, MINUA, GPC, NORAD, UNDP, CABGOC, DFID, MINADER, MEFE, MFE, MAE, Gremio ABC	1 year	\$50,000

## Research Priorities: Reducing the Knowledge Gaps

**I**N PREVIOUS SECTIONS OF THIS REPORT, we have listed actions specific to priority areas in western equatorial Africa. Debate during the Brazzaville workshop revealed the extent to which gaps in present knowledge handicap the formulation of optimal conservation strategies for apes in the western equatorial Africa region. In the face of uncertainty about the size of populations living within the priority areas, identification was made on the basis of a set of criteria that allowed confident selection of the largest remaining populations, but a crucial next step is to develop better census methods. Faced with the new threat of Ebola, it is not only important to have the ability to detect population declines but also to directly seek potential ways of controlling epidemic disease. Improving methods, creating open-access databases and exploring new avenues in conservation science will require “thinking out of the box” and bringing non-traditional partners into collaborative networks. In the sections below, priorities for research are outlined. There is urgency, as without these advances, our ability to protect gorillas and chimpanzees in western equatorial Africa will remain compromised.

### Census Methods and Information Accessibility

Although the forests of western equatorial Africa are claimed to be a stronghold for the long-term conservation of viable chimpanzee and gorilla populations, the actual status of these apes remains largely speculative. Most available survey estimates are outdated, inaccessible, and lack sufficient precision for monitoring population trends. Of 150 ape abundance estimates collated for the ape workshop, only 36% of surveys were conducted within the last five years and 56% of

estimates had been published<sup>43</sup>. Further, most reported estimates lack the sensitivity needed to detect changes in ape populations. Effective ape conservation in this region will require renewed sampling efforts, refinement in survey methodology, and improved data accessibility for real-time population monitoring.

A pragmatic approach must be taken to improve existing survey methodologies and investigate alternative methods to survey ape habitats. Currently available methods to survey ape populations in the dense forests of western equatorial Africa are labor intensive and yield low-quality results. Remote sensing technology, genetic mark-recapture methods, and acoustic sampling are promising approaches to improving ape population estimates, which need to be evaluated. Simultaneously, efforts must be allocated to methods, research and development for threat detection and mitigation.

A centralized database effort to collate information on ape distribution and abundance was initiated for this workshop, but requires further professional development to create a web-based user-interface and expand the database platform to include other ape taxa. By compiling information that can be used to create dynamic spatial models of environmental and human variables, which influence ape abundance, this database would be an invaluable resource for strategic conservation planning and immediate threat detection. Potential data sources include geo-referenced ape survey data, satellite imagery, and information collected by forestry prospectors during inventories for management plans. Crosscutting collaborations will need to be established among local governments, research institutions, conservation organizations, and local industrial interests to synthesize

information for this database. Contributions of data and expertise from this diverse group will help ensure the preservation of remaining ape populations in the changing context of ape conservation in western equatorial Africa.

Census Methods and Information Accessibility Priorities	Time Frame	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Refine current survey methods and evaluate innovative techniques</b> to improve estimates of ape abundance.</li> </ul>	1 year	\$120,000
<ul style="list-style-type: none"> <li>• <b>Develop a centralized database</b>, which is continuously updated with geo-referenced ape survey data and relevant covariates which influence ape population size and distribution.</li> </ul>	1 year	\$55,000 <sup>44</sup>

<sup>43</sup> Ape Populations, Environments, and Surveys (A.P.E.S) Database (2005). Developed at the Max Planck Institute for Evolutionary Anthropology.

<sup>44</sup> Estimate based on one-year support for database management, survey data entry, and development of web-based user-interface platform.

## Research and Monitoring

Much remains to be learned about the ecology and behavior of chimpanzees and gorillas of western equatorial Africa, which most likely comprise the largest remaining populations of wild apes in the world. In addition to documenting the distribution and status of ape populations, research efforts must also be increased to improve our general knowledge of the ecology and behavior of these apes. This information is necessary to formulate conservation strategies, which ensure long-term population viability for both species. Unique populations and potential conservation strongholds should be identified via large-scale genetic and ape density surveys. Long-term studies of ape demography and behavior are needed to understand how these apes specifically respond to changing social and ecological



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Monitoring chimpanzee populations in the Goualougo Triangle. Each individual can be identified through its distinct facial features.

environments. For example, determining the immediate and long-term responses of wild apes to logging disturbance remains unresolved. The largely undocumented cultural traditions of these wild apes are also increasingly endangered by human pressures and habitat fragmentation.

Establishment and promotion of large-scale

Research and Monitoring Priorities	Time Frame	Funding Needed
<ul style="list-style-type: none"> <li>• <b>Establish a regional monitoring program</b>, which coordinates surveys and monitoring, increases national capacity, and ensures consistency of monitoring methods across priority areas.</li> </ul>	2 years	\$190,000 <sup>45</sup>
<ul style="list-style-type: none"> <li>• <b>Provide capacity building opportunities</b> in ape research and monitoring methods and technical support for national researchers.</li> </ul>	2 years	\$150,000

survey and monitoring efforts could most effectively be achieved by establishing a coordinated regional monitoring program, with full endorsement of the regional and international scientific and conservation community. Some key objectives of this program include identifying important areas where survey data or monitoring programs are lacking, facilitating collaborative monitoring projects between areas and across borders, ensuring consistency in survey and monitoring methodologies, building national capacity in each range state to conduct monitoring activities, and facilitating communication of ape population status to governments, international partners, and the scientific community.

<sup>45</sup> Includes salary for regional ape coordinator, travel and communication budget for interaction with staff at priority areas, and development of training materials for ape monitoring

## Ebola and ape survival

The challenge of protecting chimpanzees and gorillas in western equatorial Africa has been dramatically complicated by the occurrence of repeated Ebola outbreaks since the early 1990s. In large regions of northern

Gabon and now northern Congo, up to 95% of ape populations have disappeared and the most likely hypothesis is that they were victims of this virus (Walsh *et al.* 2003, Leroy *et al.* 2004). The Ebola outbreaks first affected ape populations in the Minkébé National Park and surrounding forests and then moved east affecting other regions before reaching Odzala National Park, where an outbreak is currently active (June 2005). In the process, very large numbers of chimpanzees and gorillas are dying. Ongoing research at Lossi and Odzala where studied populations of apes have been affected by Ebola will provide important information on recovery, but at present, while it is impossible to estimate overall numbers of apes lost in the western equatorial Africa region, it is possible and critical to underline the extreme gravity of the situation. In addition, in many cases, humans are known to have contracted Ebola through handling carcasses or meat of infected apes leading to numerous deaths. Therefore if we find ways to protect apes from the Ebola virus this will also protect humans.



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Veterinary teams take samples from a gorilla carcass thought to be infected with the Ebola virus. Training of field staff in sampling techniques is important for effective surveillance and rapid responses to outbreaks.

Research Priorities, *continued*

**Ebola: What can be done?**

Research on the Ebola virus has been ongoing for many years but much remains unknown, e.g., the identity of the reservoir species and how the virus jumps from the reservoir to infect great apes. In the meantime, and before we have answers to those questions, two types of activity could be effective in investigations of if, and how, wild ape populations can be protected from infection. The first is to develop a vaccine to protect apes from the Ebola virus and test its efficacy on captive and wild populations. This will require a very novel alliance between laboratory and field-based scientists in a range of disciplines including, virology, epidemiology, ecology and conservation biology as well as logistical support from habitat country governments and conservation NGOs. Such an alliance was launched during a meeting in Washington, DC, in March 2005. It is hoped that this will speed up the kind of collaborative research needed to fight Ebola virus in the region. The second avenue is to test if natural barriers, such as rivers, slow down the spread of the disease, as appeared to be the case in some regions within the Minkébé National Park. Precise analysis of the spatial and temporal progression of recent Ebola virus outbreaks within known ape populations at Lossi and Lokoué Bai will provide precious information to allow testing of this hypothesis. If rivers are confirmed as partial or complete barriers to Ebola, intervention to prevent apes from crossing them (i.e., removal of natural bridges formed by fallen trees or touching canopies) could prove to be an effective way to slow down the progression of the virus and maintain some intact populations of great apes.

**Natural recovery?**

Because disease is a natural part of the ecosystem in which gorillas and chimpanzees evolved, some have argued that intervention in the Ebola crisis is not necessary. Apes have recovered before, they will recover again. Scarce resources should, instead, be concentrated on protecting Ebola survivors from other pressures such as commercial hunting.

What this view overlooks is the extraordinarily low reproductive rates of apes. Female chimpanzees give birth for the first time at about age fourteen and thereafter only once every five or six years. Population doubling time is about 33 years. Even with perfect protection from hunting, it would take roughly 150 years for heavily impacted areas like the Minkébé region of northern Gabon to “regrow” chimp populations to pre-Ebola levels. During most of this period population size and density would be low, creating ample potential for the suite of genetic, demographic, and social problems that afflict small populations. Thus, protecting one large population from Ebola has conservation value comparable to perfect hunting protection over about 150 years. Accounting for the cost of hunting protection over this long time interval puts the potential costs of Ebola control into proper perspective. Of course,

once protected from Ebola, ape populations would also need protection from hunting. Thus, the optimal strategy for ape conservation in the region involves a combination of Ebola control and hunting protection, not one or the other.

The quest to find an effective protection against the Ebola virus needs dynamic investment and requires a broad new coalition with local authorities, conservation organizations, field ecologists, laboratory scientists and human health specialists working together.

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**Female chimpanzees give birth for the first time at about age fourteen and thereafter only once every five or six years. . . . Even with perfect protection from hunting, it would take roughly 150 years for heavily impacted areas to “regrow” chimp populations to pre-Ebola levels.**

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<b>Ebola and Ape Survival Priorities</b>	<b>Time Frame</b>	<b>Funding Needed</b>
<ul style="list-style-type: none"> <li>• <b>Conduct research into Ebola transmission dynamics</b> and potential control measures, with a focus on river barriers.</li> </ul>	2 years	\$150,000
<ul style="list-style-type: none"> <li>• <b>Evaluate the feasibility of alternative vaccine delivery</b> methods for wild ape populations.</li> </ul>	1 year	\$150,000



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A gorilla infant suckling. Western lowland gorillas are thought to have a substantially longer development phase than their mountain gorilla cousins. Inter-birth intervals can reach up to six years and infant mortality rates can be over 40%.

## Regional Threats to Chimpanzees and Gorillas in West Equatorial Africa and Recommendations for Mitigation

**A**LTHOUGH THESE ACTIONS ADDRESS SPECIFIC areas and knowledge gaps, many of the threats need to be addressed at the regional level. The following outlines these regional threats and provides recommendations for mitigation. Participants at the Brazzaville workshop were asked to identify up to three major threats to apes at each of the priority areas. Certain of these threats emerged as being consistent throughout the region, thus needing to be addressed at the regional scale as well as the site level. Commercial hunting was identified as a major real or potential threat for every site. Ebola was identified as a potent actual threat for the Odzala-Lossi-Pikounda-Ngombe-Ntokou complex and a potential future threat to apes elsewhere. Logging emerged as one of the greatest threats, especially in concessions surrounding protected areas. Without strict control, the roads and transport opportunities created by industrial logging systematically lead to a massive increase in commercial bushmeat hunting. While threats from poaching and disease were common to all of the areas, other threats such as commercial and artisanal mineral exploitation, affected some areas and require specific responses. In evaluating threats to apes in western equatorial Africa it is useful to think on two time scales. In the short term, by far the most serious threats to apes are poaching and disease epidemics. In the longer term habitat loss and disturbance will increase as a threat to apes and is likely to become, in perhaps three to five decades, as serious a threat as hunting and disease.

The following discusses these threats and offers mitigation strategies. Table 3 provides a summary of this section.

**Table 3.** Three main threats to chimpanzees and gorillas in western equatorial Africa, and suggested immediate and longer-term responses needed.

Threat	Immediate Response Needs	Longer Term Mitigation Actions
<p><b>Poaching</b> Poaching of great apes in western equatorial Africa occurs despite the fact that they are protected under both national and international laws in all range states. Although hunters rarely target apes, the apes are killed when encountered and can be caught in wire snares.</p>	<ul style="list-style-type: none"> <li>• Implement strict enforcement of wildlife protection laws in protected areas through guard patrols;</li> <li>• Increase human capacity by recruitment and training to increase effective control on weak links in the chain of supply: transport routes and markets;</li> <li>• Improve application of legal sanctions by awareness campaigns for police, gendarmes, judges and prosecutors.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct education campaigns to change attitudes;</li> <li>• Reduce demand for ape meat through specific education about health risks;</li> <li>• Provide alternative protein sources in rural areas (husbandry, ranching, fish farming);</li> <li>• Create alternative employment for professional bushmeat hunters (park guards, ecotourism);</li> <li>• Review sanctions for infraction of wildlife laws to ensure effective dissuasion (fines, destruction of illegal firearms and confiscation of vehicles).</li> </ul>
<p><b>Disease</b> Great apes are vulnerable to many pathogens that affect humans and also to zoonotic disease epidemics such as Ebola.</p>	<ul style="list-style-type: none"> <li>• Develop broad-based great ape health monitoring and surveillance programs across key areas;</li> <li>• Develop rapid response systems to ape mortality;</li> <li>• Implement preventative health programs for protected area staff;</li> <li>• Target research on Ebola epidemiology and possible control strategies;</li> <li>• Identify and mitigate risky human behavior in proximity to ape habitat.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct education and outreach in local communities on disease risk;</li> <li>• Improve local livelihoods and health structures in key communities;</li> <li>• Train local professionals in health monitoring techniques;</li> <li>• Implement control strategies to protect apes from Ebola.</li> </ul>
<p><b>Logging</b> Logging facilitates bushmeat hunting by the construction of roads that connect isolated forests to urban centers, by creating new demand for bushmeat by workers and dependents, and by providing transport opportunities in company vehicles.</p>	<ul style="list-style-type: none"> <li>• Extend partnerships between protected areas and logging companies working in buffer zones;</li> <li>• Provide strict control of access routes to prevent commercial bushmeat hunting;</li> <li>• Provide alternative sources of protein to work force and dependents.</li> </ul>	<ul style="list-style-type: none"> <li>• Include obligation to enforce wildlife protection laws in regional certification schemes for sustainable logging;</li> <li>• Conduct further research on impact of logging on apes, especially chimpanzees, over medium-long time span.</li> </ul>

Regional Threats and Recommendations for Mitigation, *continued***Poaching of apes**

There are two alternative but complementary approaches to protecting apes from poaching. One is to restrict the supply of ape meat through more intensive law enforcement. The other is to reduce the demand by supplying alternative sources of protein, changing cultural attitudes about ape meat consumption, or providing employment in fields such as ape tourism that rely on healthy ape populations. Both of these approaches will play an important role in future ape conservation but it is crucial to recognize that they differ in the speed with which they can be effective. Intensified law enforcement activities can have an almost immediate impact, while changing cultural attitudes, developing tourism, or providing alternate protein sources on large enough scales will take years or even decades. This distinction is critical because the current rate of ape decline is so staggering. If the impacts of commercial

hunting are not dampened immediately there will be relatively few apes left to protect by the time demand-side strategies begin to take hold.

Anti-poaching has proven to be the single most effective means of protecting apes in western equatorial Africa. It is the foundation upon which all other ape conservation activities rest. It

needs increased and, just as important, sustained funding. Furthermore substantial investment is needed to increase human capacity by hiring new law enforcement staff as well training existing and new guards. However, anti-poaching patrols and checkpoints cannot succeed in isolation. The judicial system is a critical link in the law enforcement chain, and judges and prosecutors need to be pulled into the system through training in wildlife law and inclusion in regional wildlife protection efforts.

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**Anti-poaching has proven to be the single most effective means of protecting apes in western equatorial Africa. It is the foundation upon which all other ape conservation activities rest. It needs increased and, just as important, sustained funding.**

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**Box 3. Great ape conservation through environmental education**

Cross-cutting across multiple disciplines and threats, local, national and international communities, education is the fundamental method by which to engage people in conservation. Given the cultural and ecological significance and all-round charisma of species such as gorillas or chimpanzees, education can be an extremely powerful tool with which to effect change over the long term. Approaches to environmental education vary depending on the region and the target audience, but in all cases the use of values or methods with which the audience can identify is essential to bring about a positive change in attitudes to apes and their conservation.

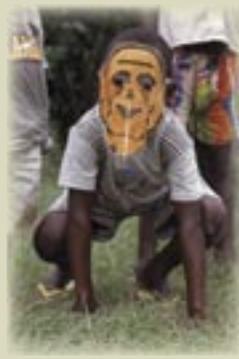
**Case-study 1:** In the Nouabalé-Ndoki National Park in the Republic of Congo, staff from a gorilla research project at Mbeli Bai have launched a conservation club, Club Ebobo ('ebobo' means gorilla in the Lingala language) in the local village, using the activities of the gorilla research project as a basis for teaching children about apes and their role in the forest, as well as widening support for conservation in and around the national park through the use of games, puppets and role plays. In attempting to teach children to appreciate wildlife for its own sake, the Club also organizes field trips to Mbeli Bai in order for children to experience gorillas and other animals in their natural habitat.

**Case-study 2:** A conservation NGO, INCEF (International Conservation and Education Fund), is proposing to use the power of media and theatre at a grass-roots level to impart scientific knowledge of the potential for disease transmission from bushmeat—with a focus on Ebola—and promote discussions for alternative protein sources. Films will be produced using real-life stories told in local languages in order to convey the message and attempt to dispel the many myths associated with diseases like Ebola.



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Ecoguards stop a truck on a major logging road in northern Congo. Mandatory checks at regular control posts have proved effective in reducing the quantity of bushmeat illegally transported on logging vehicles circulating in forestry concessions.



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A child takes part in a Club Ebobo role play and puppet game. The club teaches children about apes and their role in the forest.

Regional Threats and Recommendations for Mitigation, *continued*

Improvements in mitigation strategies must focus on the weak links in the bushmeat trade chain of supply. Catching poachers in the act in the dense tropical forest is difficult, but improving intelligence gathering and subsequent searches can be effective. Law enforcement along transport routes and in markets and cross-border law enforcement cooperation are also effective.

Improvements in legislation can contribute as well, by making offenses more costly and allowing law enforcement agencies to either destroy or keep guns and ammunition confiscated for law enforcement purposes, rather than returning them, as often happens, to the owner or them ending up in the hands of corrupt officials.

The supply-side approach will require a combination of time-tested strategies and innovative solutions. Much progress has already been made in providing employment linked to conservation (tourism, protected area staff), which has been changing attitudes in several important ape areas. In some regions protected areas are among the largest employers, but this is often not well documented and publicized.

Awareness raising and environmental education are important long-term strategies and are already ongoing in many regions (Box 3, left). These need to be intensified and brought to the national level. It should be stressed that it is not only a question of conservation of apes but also an issue for national public health. Recent collaboration between health and protected area managers and conservationists is a positive development that should be extended and include the media, education officials and practitioners.

## Disease

While disease is a natural component of wildlife ecology, evidence suggests that in western equatorial Africa, endemic disease is having a catastrophic effect on great apes. The Ebola virus has had a devastating impact and may be responsible for a 50–90% decline in ape populations in many parts of Gabon and Congo over recent years.

Furthermore, disease risks posed by humans may levy an additional burden on great ape populations, given the genetic relatedness between humans and apes and potential for disease transmission. Apes have already been shown to be vulnerable to human pathogens, mainly those associated with respiratory, intestinal and skin diseases (Wallis and Lee 1998; Graczyk *et al.* 2002; Nishida *et al.* 2003). Whilst human population densities in remote forested regions of western equatorial Africa are typically low, these rural communities often have minimal or no access to health infrastructures. Recent studies in Gabon show 100% of the studied human population, which shares habitats with apes, are not vaccinated against diseases such as



A female gorilla with a facial disease, possibly yaws. Given our genetic similarity to great apes, the potential for transmission of human diseases to gorillas and chimpanzees is high.



© Foto Natura Onk & Azink

Natural swampy clearings—called “bais” in the local language—are relatively common across much of Gabon and Congo and offer considerable viewing opportunities of western lowland gorillas. They are of great ecological significance, as the gorillas feed on the aquatic herbaceous vegetation there.

scabies, yaws and tuberculosis that can spread through ape populations with high mortality rates. In addition, conservation and research activities such as habituation, ecotourism, provisioning, reintroduction and release increase risk of infection with human diseases. However, very little information is currently available on the health status of wild apes in western equatorial Africa or the full range of pathogens that affect them. This paucity of data compounds the challenges in evaluating changes in the health of wildlife or the risk associated with anthroozoonotic or zoonotic diseases. Research on both healthy and diseased ape populations as well as the human populations living around them are therefore critical.

The approach to protecting apes from disease is a holistic one and must include great ape health monitoring and surveillance programs. Collecting baseline health data from wild ape populations is a critical tool for identifying changes associated with risky human behavior, and an early warning system for new or novel pathogens before a potential crisis arises. Given that

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**The Ebola virus has had a devastating impact and may be responsible for a 50–90% decline in ape populations in many parts of Gabon and Congo over recent years.**

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much of great ape habitat in western equatorial Africa is remote, extensive and logistically challenging, health monitoring will generally require non-invasive methods (i.e., fecal collection). Central to this is the development of new and innovative methodologies to opportunistically screen such samples, and collaborations between national and international laboratories should be encouraged to this end. Rapid and safe systems for diagnostics and response to ape mortality should be developed in tandem with monitoring programs, specifically in the event of potential disease epidemics, such as Ebola.

Preventative health programs, which include policies aimed at protecting apes (such as stringent tourist visiting rules) and human health programs for protected area employees are important in ensuring that people are healthy and pose minimal risk to apes. In the long term, a “one health” approach with efforts to improve livelihoods of communities through outreach, education, and access to medical care are the only solution to decreasing the risk of human-disease transmission to apes. Finally, capacity building and training of local professionals and government staff in order to build up logistical, technical and administrative support structures is key to the long-term success of monitoring ape populations and their pathogens.

## Logging

In the past decade, industrial logging has expanded inland and now affects almost all ape habitat in western equatorial Africa except national parks (with few exceptions) and some other protected areas (Collomb *et al.* 2000). The penetration of logging roads and vehicles into previously remote areas of forest coupled with the associated indirect effects of rapid human immigration and population growth has produced an explosion in commercial hunting, with bushmeat, including apes, marketed not to local villagers but to salaried workers in logging camps, regional towns, and major cities. Thus, the logging industry is a very important partner in any strategy for ape conservation in western equatorial Africa. At present, logging in remote forests of the region is selective and results in about 10% loss of canopy and basal area (White 1994). Significant efforts, driven by reforms in national forestry laws, are underway to introduce low-impact logging techniques and regional certification schemes to give added value to timber.

Of immediate concern are the logging concessions in proximity to existing protected areas. The priority areas for ape conservation identified by the participants at the Brazzaville workshop include, in many cases, both protected areas with large populations of apes and adjacent logging concessions. A critical strategy in this respect is working with logging companies and governments in these concessions, both on anti-poaching and habitat protection, in order to augment the size of protected populations and to buffer them from the impact of human activities. Poaching in logging concessions can be reduced by bushmeat transport interdiction, controlling and managing hunting, providing alternative sources of protein, and education of logging employees and their dependents (Tutin *et al.* 2001; Elkan *et al.* 2005). Habitat destruction and disturbance can be diminished by



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Commercial logging is expanding rapidly across much of west central Africa, threatening ape populations over enormous areas in central Africa.

proper and controlled low-impact forest management, including road planning and logging cycles (Elkan *et al.* 2005).

Independent certification has shown to be an effective market driven management tool to reduce logging impacts. However, further research on logging and its direct influence, especially on chimpanzees, is crucial to develop better guidelines for the logging industry to implement best practices in forest management.



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International markets for tropical hardwood can encourage sustainable forestry measures through the application of Forest Stewardship Council certification standards that guarantee that the timber comes from a well-managed forest.

## What Will it Cost to Implement Urgent Actions for Chimpanzees and Gorillas Across Western Equatorial Africa?

**T**HIS PLAN HAS PROVIDED LISTS of activities for each priority area for great apes in western equatorial Africa and estimated how much it will cost to implement them. We have also detailed the gaps in our knowledge, stressed the urgent need to fill these gaps, and estimated how much this might cost. These urgent actions add to a total of \$29,275,000 to protect great apes in western equatorial Africa.

Legally protected areas are the cornerstone of any conservation strategy, but most of those in the western

equatorial Africa region remain under-funded and therefore not always able to provide effective protection for apes and other species. Ensuring adequate funding levels and sustainable sources of finance for protected area management is one of the greatest challenges to conservation. Based on Blom's (2004) calculation of costs of recurrent expenditure for effective management of protected areas in each country, the existing protected areas within the priority sites for ape conservation would require about \$16 million per year.

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**A total of \$29,275,000 is needed to protect great apes in western equatorial Africa.**

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A young black-back gorilla feeds on herbs at Mbeli Bai. These clearings have greatly facilitated our capacity to observe gorilla groups, and as such, have improved our understanding of their social organization and behavior.



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A juvenile chimpanzee pant hoots. New forms of tool-using behavior in the central chimpanzee were recently documented in the Goulougo Triangle, which provides exciting evidence about the behavioral diversity of this species.

## Conclusions

**WESTERN LOWLAND GORILLA AND CHIMPANZEE** populations in western equatorial Africa are in steep decline. We do not know exactly how many remain, but the alarming average annual rate of decline of 4.7% in Gabon between 1983–2000 (Walsh *et al.*, 2003) and the high mortality >80% recorded in two studied populations affected by Ebola underline a critical state for conservation and the need for urgent reinforcement of their protection. In this report we identify site and regional based activities that are required and, importantly, define how to reinforce the knowledge base upon which conservation strategy design and implementation depends.

The protection of the 12 priority ape populations identified during the Brazzaville meeting in May 2005, from which this report is the main outcome, would guarantee the survival of the majority of apes remaining in the region if successfully implemented. The consensus reached on a clear list of the most urgently needed activities for each site provides strong conservation strategies for the immediate future and we estimate that with about 30 million dollars over the next five years, this could be achieved. We hope that funding agencies will understand the urgency of the situation and seize the opportunity to support such a broad agreement.

The identification of 12 priority areas, which contain the largest remaining wild populations, indicates where efforts and investments must be focused on the ground in order to ensure the best possible case scenario for great ape conservation in the region. The list of areas is not “set in stone” nor are their geographical boundaries. Conditions can change rapidly and some

areas, such as the two identified on pages 22 and 23, need surveys to establish the present status of apes, while others were too small in size to be included but contain populations that may have long-term viability. Without effective monitoring of wild ape numbers and health status, optimal conservation will not be possible thus there is extreme urgency to advance applied research on these issues in addition to reinforced multi-disciplinary investigation of Ebola prevention in the face of this extremely potent new threat.

It is illegal to kill or capture apes in all of the habitat countries of *Pan troglodytes troglodytes* and *Gorilla gorilla gorilla*, thus law enforcement is the central thread of the conservation strategy. Effective law enforcement requires a huge investment but, given this, it would have an immediate positive effect for apes. In the face of the staggering ongoing decline, dampening the impact of commercial hunting on apes is the easiest action to implement—through arrest and prosecution of poachers and through control of access and transport opportunities in the key protected areas and logging concessions identified as ape strongholds. Clearly, enforcement must be accompanied by awareness and education campaigns and the creation of jobs and appropriate incentive systems for rural populations.

Once an ape population is reduced by hunting or disease, its capacity to recover is limited due to very slow reproduction and complex social behavior. The “natural protection” afforded in the past by the large remaining blocks of forest habitat isolated from human activities is eroding as logging spreads into the most remote parts of the western equatorial region of

Africa. The addition of Ebola to poaching and habitat loss has created a potent cocktail of threats to apes in this region. Strong political will for conservation and environmental protection exists in western equatorial Africa, as well as mechanisms for cooperation at a regional level. This provides hope that with increased international aid, implementation of the recommendations of the expert group who met in Brazzaville in May 2005 can be achieved quickly and this will make a very significant difference to the survival of chimpanzee and gorillas in these six countries.



Forest savanna mosaic in the coastal zone of Conkouati-Douli National Park, Republic of Congo. This region boasts high chimpanzee densities, because they are considered taboo for hunting by the local people.

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Children sing out during a conservation education session of Club Ebobo in northern Congo.

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## List of Acronyms

- CABGOC** Cabinda Gulf Oil Company, Angola
- CAR** Central African Republic
- CARPE** Central African Regional Program for the Environment, USA
- CAWHFI** Central Africa World Heritage Finance Initiative (UNESCO)
- CBFP** Congo Basin Forest Partnership (USAID)
- CENAREST** Centre National de Recherche Scientifique et Technique, Gabon
- CFC** Conservation de la Faune Congolaise
- CIAD** A local NGO, Cameroon
- CIB** Congolaise Industrielle de Bois, Congo
- CIFOR** Center for International Forestry Research
- CIRMF** Centre International de Recherche Medicale de Franceville, Gabon
- CMP** Cybertracker Monitoring Programme
- CNPN** Conseil National des Parcs Nationaux, Gabon
- CNRS** Centre National de la Recherche Scientifique, France
- CPC** Centre Pasteur du Cameroun
- CRES** Conservation and Research for Endangered Species, Zoological Society of San Diego, USA
- DFC** Direction de la Faune, Gabon
- DFID** Department of Finance and International Development, UK
- ECOFAC** Conservation et Utilisation rationnelle des ressources en Afrique Centrale
- ENEF** Ecole National des Eaux et Forêts, Gabon
- EU** European Union, Belgium
- FEDEC** Foundation for Environment and Development, Cameroon
- FFEM** Fonds Français pour l'Environnement Mondial, France
- FFI** Fauna & Flora International
- FIGET** Fondation International Gabon Ecotourisme
- FMU** Forestry Management Unit
- FRM** Forest Resource Management
- GEF** Global Environment Facility, USA
- GPC** Provincial Government of Cabinda, Angola
- GRAET** Great Ape Ebola Taskforce
- GTZ** Gesellschaft fur Technische Zusammenarbeit
- HELP** Habitat Ecologique et Liberté des Primates, Republic of Congo
- IDF** Forestry Development Institute, Angola
- IFO** Industrie Forestière de Ouessou, Congo
- INDEFOR** Instituto Nacional de Desarrollo Forestal, Equatorial Guinea
- IRAD** Institut de Recherche Agricole pour le Développement, Cameroon
- IRET** Institut de Recherche en Ecologie Tropicale, Gabon
- ITTO** International Tropical Timber Organization, Japan
- LNSP** Laboratoire Nationale de la Santé Publique, République du Congo
- MAE** Ministère des Affaires Etrangères, Republic of Congo
- MEFE** Ministère de l'Economie Forestière et de l'Environnement, République du Congo
- MEFEPE** Ministère de l'Economie Forestière, des Eaux, de la Pêche, et de l'Environnement, Gabon
- MEFEPE (P.21)**
- MFE** Ministry of Forestry and Environment, Democratic Republic of Congo
- MINADER** Ministry of Agriculture, Cameroon
- MINEEFCP** Ministère de L'Environnement, des Eaux, Forêts, Chasse et Pêche, République Centre Africaine
- MINEPN** Ministère de L'Environnement et de la Protection de la Nature
- MINFOF** Ministère des Forêts et de la Faune, République du Cameroun
- MINSANTE** Ministère de la Santé, République du Cameroun
- MINTOUR** Ministère du tourisme, République du Cameroun
- MINUA** Ministry of Urban Affairs and Environment, Angola
- MPI-EVA** Max Planck Institute for Evolutionary Anthropology, Germany
- MSPP** Ministère de la Santé Publique et de la Population, République du Congo

List of Acronyms, *continued*

- NIH National Institutes of Health, USA  
 NORAD Norwegian Development Agency  
 PGS Projet Grands Singes, Cameroon  
 PMDA Programme Mesures d'Accompagnement pour la Réserve du Dja, Cameroon  
 PNDP Programme National Participatif de Développement, Cameroon  
 PRESIDIA Prévention SIDA Cameroon  
 PSVAP Projet Sectorial de Valorisation des Aires Protégées (EU)  
 RKI Robert Kock Institute, Germany  
 SCD Société de Conservation et Développement, Gabon  
 SCS A local ecotourism NGO, Gabon  
 SEBAC Logging company, Société d'Exploitation des Bois d'Afrique Centrale, Cameroon  
 SGA Section on Great Apes  
 SI Smithsonian Institution  
 TNS Sangha Trinational, Republic of Congo/Cameroon/Central African Republic  
 TRIDOM Trinational de Dja/Odzala/Minkebe, Cameroon/Republic of Congo/Gabon  
 UAB University of Alabama  
 UNDP United Nations Development Program  
 UNEP United Nations Environment Program, Kenya  
 UNESCO United Nations Educational, Scientific and Cultural Organization, France  
 USFWS United States Fish and Wildlife Service  
 USTM Université de Sciences et Techniques de Masuku, Gabon  
 WCS Wildlife Conservation Society  
 WCS-FVP Wildlife Conservation Society Field Veterinary Program  
 WWF World Wildlife Fund  
 ZSL Zoological Society of London

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## Contributions

**ONE OF THE GOALS OF THIS ACTION PLAN** is to raise funds for the conservation of great apes in the western equatorial Africa region. Individual contacts of workshop participants are listed below if you would like to make a contribution directly to a project or site or individual. There are two existing funds for great ape conservation in this region. The Section for Great Apes of the IUCN/SSC Primate Specialist Group has created a specific fund for the conservation of great apes called the Great Ape Emergency Conservation Fund. If you would like to contribute, please contact Anthony Rylands (Deputy Chair of the Primate Specialist Group) at [a.rylands@conservation.org](mailto:a.rylands@conservation.org). You can still specify to which project or site you would like these funds to go. The USFWS Great Ape Conservation Fund also provides grants for great ape conservation and research. If you could like to contribute to this fund, please contact Richard Ruggiero at [Richard\\_Ruggiero@fws.gov](mailto:Richard_Ruggiero@fws.gov).



A group of western lowland gorillas, consisting of a silverback, two females and an infant, feeding on vegetation in a forest clearing.

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**There is high overlap between priority areas for great apes and priority areas for biodiversity in general, thus great apes are extremely important flagship species for conservation.**

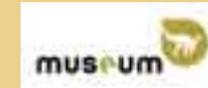
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A young male sitatunga shares a feeding patch with a group of western lowland gorillas.

Suggested reference: Tutin, C., *et. al.* 2005. *Regional Action Plan for the Conservation of Chimpanzees and Gorillas in Western Equatorial Africa*. Conservation International. Washington, DC.



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