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MEETING TO NEGOTIATE AN AGREEMENT ON THE CONSERVATION OF GORILLAS AND THEIR HABITATS UNDER THE CONVENTION ON MIGRATORY SPECIES
Paris, France, 22-24 October 2007

# STATUS REPORTS OF GORILLA TAXA

## CROSS RIVER GORILLA (*Gorilla gorilla diehli)*

# *Gorilla gorilla diehli*

# *Status report*

**Document based essentially on**
**the gorilla report prepared by IRSNB for CMS in 2005,**
**the World Atlas of Great Apes and their Conservation (published in 2005),**
**and numerous other publications**

**IRSNB**
**october 2007**

# 1. TAXONOMY AND NOMENCLATURE

### 1.1. Taxonomical remark

The taxonomy currently followed by CMS (Wilson & Reeder, 1993) recognises a single species of gorilla, *Gorilla gorilla,* with three subspecies. This comprised one western subspecies, *Gorilla gorilla gorilla* and two eastern subspecies, *Gorilla gorilla graueri* (eastern lowland gorilla) and *Gorilla gorilla beringei* (mountain gorilla).

Recently however, western and eastern populations have been widely recognised as separate full species, *Gorilla gorilla* and *Gorilla beringei* respectively. The eastern and western populations are separated by approximately 1,000 km (Garner & Ryder, 1996). Western and eastern populations can be distinguished based on external features (Groves, 2002) and clear geographic and morphological distinctions can also be seen (Garner & Ryder, 1996). Additionaly in the western group, the isolated Nigeria-Cameroon gorillas are now recognised as a subspecies, Cross River Gorilla *G. g. diehli*, of the Western Lowland Gorilla, *G. g. gorilla*, though there is much divergence even within this subgroup. The eastern group includes both the Eastern lowland *G.beringei graueri* and the two mountain populations of *G.b.beringei*. Following the newer taxonomic classification, among the mountain gorillas, the Bwindi mountain gorilla may form a third subspecies, *Gorilla beringei bwindi* (Sarmiento *et al*., 1996) although the taxonomic status of the populations is as yet unclear (McNeilage *et al*., 2001). Sarmiento *et al*. (1996) list a number of morphological and ecological differences between the gorillas of Bwindi-Impenetrable Forest and the Virunga volcanoes, and insist that Bwindi gorillas do not belong to *G. g. beringei* and so should not be called mountain gorillas. Stanford (2001) contests this and suggests that the evidence showing the Bwindi and Virunga gorillas to be taxonomically distinct is not well supported. Garner and Ryder (1996) found that the populations of mountain gorilla in the Virungas Volcanoes region and the Bwindi forest were indistinguishable using a particular mitochondrial DNA region.

The following document is a summarized conservation status report for the Cross River Gorilla, *Gorilla gorilla diehli*, the recently recognised subspecies of western lowland gorilla living in the Northern Cameroon-Nigerian border area (Sarmiento & Oates, 2000).

### 1.2 Nomenclature

The American physician and missionary Thomas Staughton Savage first described the Western Gorilla (he called it *Troglodytes gorilla*) in 1847 from specimens obtained in Liberia. The name was derived from the Greek word Gorillai (a "tribe of hairy women") described by Hanno the Navigator, a Carthaginian navigator and possible visitor (circa 480 BC) to the area that later became Sierra Leone.

#### 1.2.1 Scientific name

*Gorilla gorilla diehli* (Matschie, 1904)

In 1904, Paul Matschie, a mammalian taxonomist working at the Humboldt University Zoological Museum in Berlin described a new species of gorilla inhabiting the watershed of the Cross River in what was then German Cameroon. Matschie named the species *Gorilla diehli* in honour of Mr. Diehl, an employee of the German Northwestern Cameroon Company, who had collected the gorilla skulls on which Matschie based his new species. According to Matschie the 1) short skull, 2) short molar row, 3) palate shape, 4) and skull base shape distinguished *Gorilla diehli* as a new species separate from *Gorilla gorilla*. Matschie also noted in his description that one of the female skulls collected by Diehl from the same area was not *G. diehli*, but *G. gorilla*, and claimed both species existed together in the Cross River catchment's area. The potential occurrence of two morphologically distinct gorillas from the same locality supported Matschie's claims that the two were distinct species. Two gorilla populations could not possibly inhabit the same isolated area and remain morphologically distinct.

Subsequent classifications by Rothschild in 1904 and Elliot in 1912 agreed that the Cross River gorillas were not a new species and demoted the population to the subspecies *Gorilla gorilla diehli.* Neither author

examined the specimens described by Matschie, or tested Matschie's claim that two morphologically distinct gorillas inhabited the Cross River watershed.

If Matschie's claim was true, *G. g. diehli* could not possibly be a subspecies. Harold Coolidge's revision of the genus Gorilla in 1929 placed what was then recognized as *G. g. diehli* into the subspecies *G. g. gorilla*. He based his decision largely on anecdotal accounts of gorilla distribution, believing Cross River gorilla populations were continuous with those of other western lowland gorillas. Coolidge, like his earlier counterparts, failed however, to address Matschie's claims.

Although Colin Groves in 1970 revised gorilla taxonomy and added a subspecies (*Gorilla gorilla graueri*) to the eastern gorilla populations, Matschie's claims remained unchallenged and Coolidge's taxonomy remained by and large the framework of the currently accepted classification. By now, the Cross River gorillas were known to occur in eastern Nigeria as well as south-western Cameroon, and they had at least been recognized by Groves as a distinctive far-western population.

Working on primate distribution and behaviour in West Africa for the past 30 years, John Oates had long ago recognized the Cross River watershed, the Cameroon highlands and Bioko island as an area of primate endemism. The Sanaga river to the south of this area seems to act as a barrier to primate migrations from the extensive forests of western equatorial Africa, which cover most of southern Cameroon, Gabon, Equatorial Guinea, northern Congo and south-western Central African Republic and are inhabited by *G. g. gorilla*.

### 1.2.2 Synonyms

*Gorilla zenkeri?*

### 1.2.3 Common names

**English** – Cross River Gorilla
**French** – Gorille de Cross river, Gorille de Diehl
**German** – Cross-River-Gorilla
**Spanish** - Gorila del Cross River

### 1.2.4 Description

Very large, the largest living primates. Barrel-chested ape with relatively even hair, a bare black face and chest and small ears. The bare shaped brows are joined and the nostril margins are raised. Females are much smaller than males. Gorillas move around by knuckle-walking. Adult males range in height from 165-175 cm (5 ft 5 in-5 ft 9 in), and in weight from 140-200 kg (310-440 lb). Adult females are often half the size of a silverback, averaging about 140 cm (4 ft 7 in) tall and 100 kg (220 lb). Occasionally, a silverback of over 183 cm (6 feet) and 225 kg (500 lb) have been recorded in the wild.

Cross River Gorillas do not seem to be very easy to identify from others western gorillas except that they differ significantly in their skull measurements and in particular in mean cheek tooth surface and the usual absence, or relatively poor development, of the sagittal crest in many male.

This differences have been associated with shifts to more open habitats, and these characters could also be associated with lower fruit abundance in habitats at high elevations, or/and with long dry seasons. It is however unclear how the distinctive morphology of Cross River gorillas relates to food specialisation in the habitats they presently occupy or if it is due to the habitats in which they originally differentiated and/or to which they are best suited. In this regard the extensive and unique montane forest ecosystem of the Obudu Plateau and other areas of Bamenda Highlands (Keay, 1979) which once existed may be a better representation of the habitat in which the taxon evolved.

## 2. BIOLOGY OF THE SUBSPECIES

## 2.1 General Biology

Gorillas are mainly terrestrial. The gorilla's large size and folivorous habits mean that the animals must spend long hours feeding everyday to maintain their body weight. Of all the great apes, the gorilla shows the most stable grouping patterns. The same adult individuals ravel together for months and usually years at a time. It is because gorillas are mainly foliage eating that they can afford to live in this relatively permanent groups. Foliage, unlike fruit generally and especially the ripe fruits that the ape gut require, comes in large patches than can in turn support large groups of animals. In west Africa, where fruit form a far higher proportion of the gorilla's diet than in the East, gorilla groups tend much more often to split into temporary subgroups that they do in east Africa, as animals range far apart searching for the relatively scarce ripe fruit. Gorilla groups can include up to 30-40 animals, but more usually number 5-10.

### 2.1.1 Habitat

The Gorilla is a forest species. They inhabit tropical rain forests, forest edges and clearings, riverine forests, swamps, and abandoned cultivated fields.

Cross River gorillas inhabit in low-lying and submontane tropical and subtropical broadleaf forests at elevations from 200 to 2000 m (Sarmiento & Oates, 2000, Sarmiento 2003, Oates *et al*., 2007). Its closest relative the Western lowland gorillas that live in mixed swamp forests experience one rainy and one dry season per year. Average rainfall is 1500 mm with the greatest amount of rain falling between August and November and diminishing during December through March (Clark 2004).

Sarmiento & Oates (2000) describe the habitat occupied by Cross River Gorilla in the lower elevation as moist semideciduous forest. The forest has probably been disturbed by people for many generations and should therefore best be considered an old secondary forest. Much of the forest, however, has not been recently disturbed, and large trees are relatively abundant in the areas furthest to human settlement. *Lophira alata*, *Cylicodiscus gabunensis*, *Piptadeniastrum africanum*, *Berlinia bracteosa*, *Brachystegia nigerica*, and *Terminalia spp*. are among the more common species of large trees. In younger forest, species as *Pycnanthus angolensis* and *Musanga cecropoides* are common. The latter tree is found in secondary and disturbed forest throughout tropical Africa and bears fruit commonly consumed by African Apes and monkeys. At higher elevation, above approximately 700 m the composition and height of the forest canopy change; at these intermediate altitudes large mahoganies and *Santiria trimera* are frequently seen. Above 1000 m there are distinctly montane elements in the flora, including *Cephaelis mannii* and *Podocarpus milanjianus*, and at the highest elevations (ca 1500m) there is montane forest with smaller trees and abundant epiphytes.

Much of the forest at higher altitude (1500 to 1800m), where the taxon possibly evolved or for which he is possibly best suited, has been converted to grassland by a long period of human occupation (cultivation, burning, cattle grazing) and so are not anymore available.

It is not obvious that the Cross River gorillas have strong habitat preference within their present range. In Nigeria they currently live almost entirely in the most rugged terrain in the Afi and Mbe mountains and at the heawaters of the Asache and Mache rivers below the Obudu Plateau of Nigeria; in these areas the forest is often broken by sheer rock faces or rocky outcrops. In the Takamanda reserves in Cameroon their nests are found in high concentrations only in hilly areas (400-700m) close to the localities where they were first collected by Diehl. This distribution may be the consequence of long term hunting pressure.

### 2.1.2 Adaptation

Gorillas are closely related to humans and are considered highly intelligent. Cross River gorillas are rare an shy as a result of hunting.

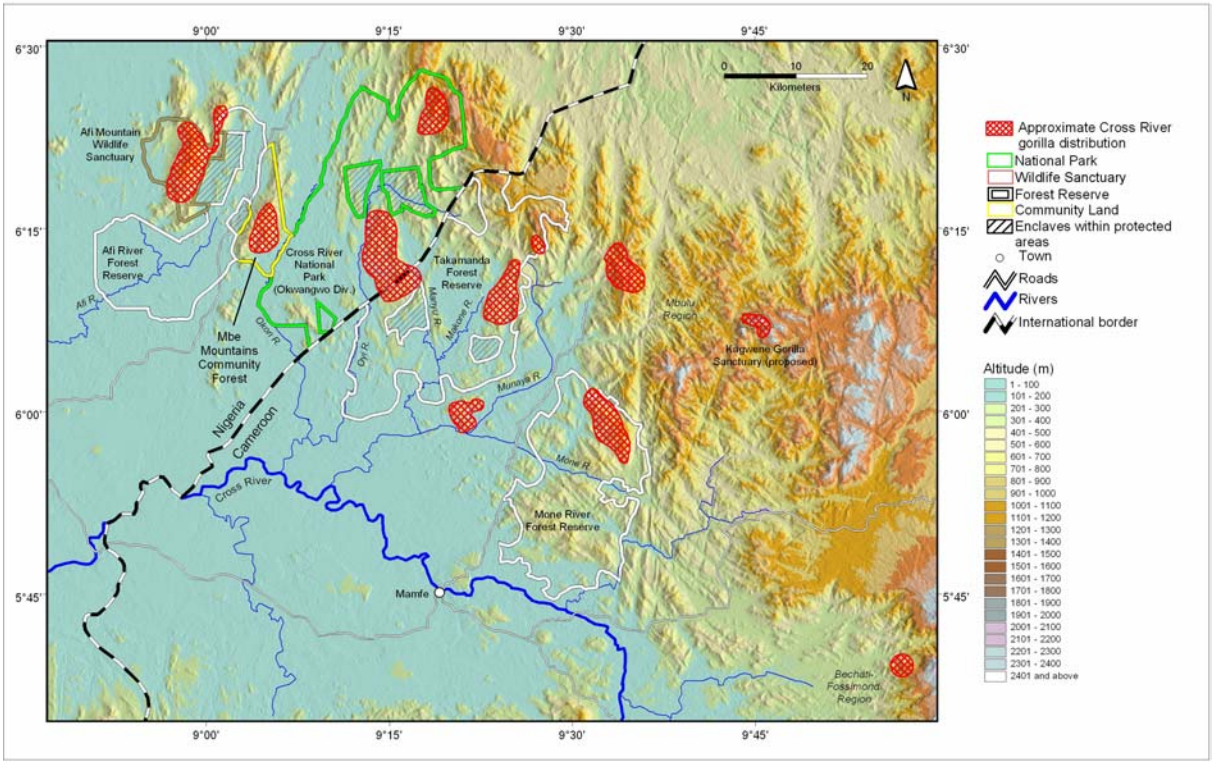
### 2.1.3 Social behaviour

Only a handful of direct sightings of Cross River gorillas have been made, almost all the information on their ecology and behaviour derives from observations of sleeping nests, feeding trails, and reports by local hunters. Nest clusters suggest that group size is typically small (fewer than 6 weaned individuals) although much larger groups occur. At Afi mountain nesting patterns suggest that a group as large as 20 individuals will sometimes divide into smaller foraging parties.

As far as group structure is concerned, gorillas do form harem. It was once thought that gorilla groups contained only one adult male, but around one third of groups in both East and West Africa have been found to host two full-grown males. Adult female in anyone silverbacks (dominant adult male) harem are mostly unrelated, and the social ties that exist between them are weak. In contrast to many other primates, it is the bond between each individual female and the silverback, rather than bonds between the females that hold the group together. Upon reaching maturity, both the males and females leave the natal group. The females usually join another group or a lone young adult male, whereas the males remain solitary until they can attract females and establish their own groups (Masicot, 2003). After emigration, some males may spend a large proportion of their time in their natal group's home range (Harcourt *et al.,* 1981). At least with Mountain gorilla, it is unusual for adult males to migrate into other groups (Yamagiwa, 1987). Of the 15 changes in the size and composition of the two main study groups between 1972 and 1974 listed by Harcourt *et al*. (1981), 11 were due to migrations.

## 2.2 Distribution (current and historical)

**Figure 1. The distribution of the Cross River Gorilla, *Gorilla gorilla diehli* (original map by Richard A. Bergl)**




Cross River gorillas are restricted to a limited area (<10000 km²) of southwest Cameroon and neighbouring parts of Nigeria, between 5°55'-6°25'N and 8°50'-10°00' E. The Cross River gorillas are said to have ranged into the relic montane forests of the Obudu plateau (1500-1700m elevation) until the recent past (Harcourt *et al*., 1989). There are now eleven known discrete localities where Cross River Gorilla exist. Recent genetic studies suggest that gorillas at 10 of these localities (extending east from Afi Mountain in Nigeria to Kagwene Mountain in Cameroon) constitute one population, divided into three subpopulations which still

occasionally exchange individuals. Potential gorilla habitat still connects all of these localities, although sometimes tenuously (Bergl & Vigilant, 2007; Oates *et al*., 2007).

The Cross river gorillas are the most northern and western of all gorilla populations and are separated from the nearest *Gorilla gorilla gorilla* population to the south by approximately 250 km. They are distributed in and around a set of escarpments whose peaks rise above the low-lying coastal forests and reach a maximum elevation of 1600-2000m. Interspersed between the Cross River area and the nearest outpost of western equatorial African forest occupied by other Gorillas are the grasslands and fragmented forests of the Cameroon highlands, and the relatively densely settled lowlands of western Cameroon, which effectively isolate the Cross River gorillas from the other west African gorilla populations.

### 2.3. Evaluation and evolution of populations

Accurate population estimates for gorillas are often difficult to establish, because their hugely vast range has not yet been thoroughly surveyed. Population counts and estimates of gorillas are commonly carried out on the basis of nest or sleeping site counts (e.g. Inogwabini et al., 2000). Adults and immature weaned animals build new nests to sleep in each night. The nests are counted and any dung adjacent to each nest examined gives a reliable indication of group size as well as age of animal, particularly when the counts are repeated over several nights.

Cross River Gorilla is probably a restricted range taxon since a very long time. From the early 1930s to the late 1960s there were scattered reports on the distribution and abundance of Cross River gorillas. The 1966-1970 Nigerian civil war and lack of information meant that by the late 1970s, a general view had developed that the Cross River gorillas had been extirpated at least from Nigeria if not from Cameroon.

But in 1983 surveys by Clement Ebin of the Cross River State Forestry Department obtained evidence of gorilla populations living in Nigeria's Mbe Mountains. Estimations were very low, with only around 100-200 believed to be remaining in the wild. Further surveys in Nigeria and Cameroon in the 1990s have established the then-known distribution of the Cross River gorillas with probably no more than 200 individuals in 4 isolated (sub)populations.

The latest research indicates that there may be up to (250-)290 Cross River gorillas surviving in the wild and, specifically within Cameroon, that they are more widespread than previously believed (Oates *et al*. 2007). Although the discovery of new localities is encouraging, some of these localities are quite isolated, and therefore pose conservation challenges.

The remaining 290 individuals of Cross River Gorillas are divided into eleven discrete localities most of them connected by large tracts of continuous forests. The whole taxon is considered as critically endangered.

**The Cross River gorilla (*Gorilla gorilla diehli*) (IUCN 2002, CR A2c; C2a(i))** is the most restricted range gorillas, being found only in 11 discrete localities on the Nigerian-Cameroon border. It is thought that fewer than 300 of these animals survive today. Its conservation status is obviously "critically endangered", using the most recent IUCN criteria (Harcourt, 1996).

### 2.4. Migrations

Some pattern of seasonal migration are observed. Hunters who frequent the forests below the Obudu Plateau report that gorillas use higher elevations in the wet season and retreat to valley bottoms in the dry season (Oates *et al*., 1990).

Transnational dispersion should at least have occurred in the past when distribution was more continuous and field survey suggest that the Cross river gorillas still regularly cross the border between Nigeria and Cameroon.

Genetic data suggest movements between several of the areas in which Cross River gorillas are found (Bergl & Vigilant, 2007).

Information from his closest relative the Western Lowland Gorilla indicate that group travels within a home range averaging 5.6 to 15.4 sq. km. Gorillas do not display territorial behaviour, and neighbouring groups often overlap ranges (Dixson, 1981, Bermejo, 2004, Doran et al., 2004). The group usually favours a certain area within the home range but seems to follow a seasonal pattern depending upon the availability of ripening fruits and, at some sites, localised large open clearings (swamps and "bais"). Gorillas normally travel 0.5-2.0 km per day (Dixson, 1981, Doran et al., 2004).

Surveys have been undertaken to assess the ranging behaviour of the Cross River gorillas, who are known to prefer highland areas and to avoid extensive areas of lowland forest. This may be because hunting is higher in lowland areas than in the highlands.

The remaining populations are now confined to small discrete higland areas that occur within a large area of more or less continuous forest. This large forest block is beginning to be fragmented in certain areas. Trans-boundary protected area and corridors between the isolated populations have been proposed as important conservation recommendations.

## 3. CONSERVATION STATUS, BY PARTY

**Nigeria (Critically endangered)**: Within the western group, the isolated Nigeria-Cameroon gorillas are now recognised as a subspecies, the Cross River gorilla (*Gorilla gorilla diehli*); it is the most restricted of the gorillas, being found only in 11 discrete localities on the Nigerian-Cameroon border. In Nigeria there are probably three distinct subpopulations and a fourth shared with Cameroon. There are estimated to be approximately 75-110 individuals remaining in Nigeria (Oates *et al*., 2007).

**Cameroon (Critically endangered)**: Results from surveys undertaken in 2000 and 2001 indicated that there may be up to 180 Cross River gorillas remaining on the Cameroon side of the border. Before that, the Cross River gorilla (*Gorilla gorilla diehli*) was only known to survive with 100 individuals in the Takamanda Forest Reserve, located in the South West Province of Cameroon. However, as research extended into the adjacent Mone Forest Reserve and the Mbulu Forest in 2000, the presence of gorillas was discovered in these contiguous forest areas and subsequent studies were undertaken to estimate their population density. Recently the number of Cross River Gorilla in Cameroon are estimated at 125-185 individuals (Oates *et al*., 2007)

Although surveys to clarify gorilla distribution are still ongoing and this figure may be subject to change, these results confirm that the Cross River gorilla population is indeed larger than previously believed. Although this is positive news, unfortunately it does not mean that the gorillas are any less at risk of possible extinction.

## 4. ACTUAL AND POTENTIAL THREAT

The major threats affecting or having affected Cross River Gorilla populations are (1) habitat loss or modification (e.g. through deforestation, wood extraction, infrastructure development, human settlement and agricultural crops (IUCN, 2002)) and forest encroachment (Muruthi *et al*., 2000), (2) direct killing (for the bushmeat trade), or hunting (for live animals trade) (3) the population is at risk due to its very small size and its highly fragmented distribution.

These gorillas still face an uncertain future as threats to their habitat and from hunting continue to further fragment gorilla groups. Over 1998 to 2002, conservation efforts undertaken by the local people in collaboration with the Cross River Gorilla Research Project (Cameroon) and the Ministry of Forestry and Wildlife (MINFOF) project PROFA have markedly reduced gorilla hunting in these areas. However, other threats to the gorillas such as encroachment into their preferred habitat will certainly have an effect in further isolating already existing sub-populations (J. Groves, 2002).

The reported preference for highland areas and avoidance of extensive areas of lowland forest may be because hunting is higher in lowland areas than in the highlands. If lowland forest corridors cannot be secured and if gorillas are deterred from using lowland corridors to reach gorilla groups in other highland sites, inbreeding and loss of genetic variation may imperil isolated groups.

### 4.1 Degradation and decline of habitats

Throughout the gorilla's range, the forests on which it depends for survival are being cut down for timber and to make way for agriculture. Habitat loss is a major threat to gorillas as forests are rapidly being lost to commercial logging interests and subsistence agriculture.

In 2000, it was estimated that 135 170 Km² of forest remained in Nigeria, with an average annual decrease of forest cover of ca 4000 km² or 2.6 percent. There are logging concessions in almost all forest reserves in Nigeria, although not all are being actively logged. Much illegal logging also occurs. By 1987, around 24 percent of Nigeria's protected land area had already been converted into farmland, plantations, and bush-fallow. The expansion of agriculture, oil palm plantations, and road networks has led to the widespread degradation and fragmentation of great ape habitat.

### 4.2 Direct exploitation

Hunting has historically threatened the survival of Cross River gorillas. In 1989, it was suggested that in Nigeria twice as many were killed each year as were being born (Harcourt et al.,1989). At that time a single gorilla carcass could fetch as much as twice the monthly salary. About 15 communities hunted in the gorilla's range, and in 1986 just ne of these was reported to have killed eight gorillas. The hunting of gorillas is now much reduced. This is largely due to increased conservation in Nigeria, beginning with a Nigerian Conservation Foundation (NCF) project, followed by the Okwangwo program of the WWF and, most recently, a Nigerian Conservation Foundation-Wildlife Conservation Society (WCS) program. There is an occasional report of a gorilla being killed by hunters in the Okwangwo Division of Cross River NP, but there is no direct evidence of any gorillas having been killed at Afi or Mbe in the last fiver years (Oates et al., 2002).

- **the bushmeat trade**

If habitat loss or degradation has been regarded as the major threats for the Cross River Gorilla, much recent concern has been focused on the bushmeat trade. Forest is being converted to crop production and livestock grazing in many parts of Africa. Where new routes are opened up for timber or mineral extraction, exploitation of forest animals for food use (bushmeat) rises in order both to support the incoming labour force and to export bushmeat to urban markets. Although bushmeat has been, and still is culturally and nutritionally important in many regions, the impact of bushmeat hunting is now more widespread and serious on many species because it is increasing rapidly with increasing access into remote areas, and new markets are being developed to serve rising demand among urban populations, where it is considered a delicacy. Gorilla meat forms only a small proportion of the commercial bushmeat trade, but the impact on ape populations is disproportionately great because of their slow reproductive rate and the social consequences of silverback's being killed (infanticide may ensue when nursing mothers join a new male).

- **Other forms of direct exploitation**

In the past they have been killed for their heads, hands, and feet, which were sold to collectors. Infants were sold to zoos, researchers, and people who want them as pets. The abduction of infants generally involves the loss of at least one adult, as members of a group will fight to the death to protect their young.

### 4.3 Diseases

Another potential general threat to gorillas is exposure to human diseases (e.g Graczyk *et al*., 2001a; Graczyk *et al*., 2001b) particularly for habituated gorillas that come into contact with humans, in areas of gorilla tourism (UNEP-WCMC and WWF, 2001). Gorilla tourism exposes gorillas to humans and hence to any diseases that humans may be carrying, some of which the gorillas may never have been exposed to before. At present, this threat is not yet effective for the Cross River gorilla, but tourism is a possible alternative livelihood options for local people and can conduct to increase contacts with humans like it happens in Rwanda or Uganda. An evaluation of habituation of diehli for ecotourism has recently be completed (Andrew Dunn, comm. pers.).

Williamson (1999) reported that in Volcanoes National Park the most serious threat to the gorillas may be the acquisition of human parasites and disease and recently a number of gorillas in this Park have died of an unknown illness (UNEP-WCMC, 2003c). An outbreak of a respiratory disease, with the possibility of measles as the primary infection, in the Parc National des Volcans in Rwanda claimed six gorilla lives, and 27 other gorillas were successfully treated (Wallis and Lee, 1999). However, there are few data on the impacts of disease, particularly outside the Virungas (Plumptre *et al.*, 2003). In Rwanda, strict rules are in place to regulate tourist visiting times and the number of tourists per group (Plumptre *et al*, 2003). Other measures are in place and include limiting the approach of humans to 7 m, burying human excrement deeper than 30 cm and chasing gorillas from private lands surrounding the parks (Kalema-Zikusoka *et al*., 2002).

Beside severe impacts on human populations, several outbreaks of the Ebola virus since 2000 might have claimed thousands of great apes in Africa. The first, in 2000 and 2001, was centred in Uganda, the second outbreak occurred in 2001 and 2002 in Uganda and the Republic of Congo. Ebola hemorrhagic fever is a severe, often-fatal disease that affects humans and non-human primates, such as monkeys, gorillas and chimpanzees. Many scientists believe the disease is spread through the butchering and handling of primate bushmeat. The disease has been confirmed in six African nations: the Democratic Republic of Congo, the Republic of Congo, Gabon, Sudan, Ivory Coast, and Uganda. Up till now Cross River gorillas had not suffered from outbreaks of the Ebola virus but this can change…

### 4.4 Impact of Conflict

The impact of wars and political conflicts, particularly well documented for the Mountain Gorilla in Rwanda and adjacent RDC could have affected in a similar way the Cross River Gorilla during the 1960s-1970s Nigerian civil war but there is no evidence of this. In addition to the influx of refugees, the forests that are home to gorillas had served as hiding places and retreats for rebel forces leading to disturbance and hunting. This is a common phenomenon at times of war in forests close to international borders.

### 4.5 Other threats

Road development between Mamfe and Akwaya, possibly dividing Cross River gorilla populations in Mone Forest Reserve and the proposed Takamanda National Park is a potential threat.

Accidental entrapment in wire snares used to trap other wild animals is also a threat to gorillas. Plumptre *et al*. (1997) stated that the setting of snares for ungulates in the Volcanoes National Park, Rwanda is one of the greatest threats to *Gorilla gorilla beringei*. However, Williamson (1999) reported that at least 99% of the three research groups in the Volcans National Park, Rwanda were in good physical shape. These threats need to be assessed in Nigeria-Cameroon Border area.

The isolation and low numbers of Cross River gorilla populations have given rise to concerns about inbreeding but recent genetic data suggest that exchange between (sub)populations persist uptill very recently (Bergl & Vigilant, 2007).

International trade in live gorillas and gorilla parts, which used to be a threat, has declined since the gorilla was listed in Appendix I of CITES.

# 5. Regulatory provisions

## 5.1 International

International trade in live gorillas and gorilla products, formerly a significant threat to the species, has greatly declined since the gorilla was listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1977.

## 5.2 National

Nigeria ratified the African Convention on the Conservation of Nature and Natural Resources in 1968, the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973, and the Convention on Biological Diversity (CBD) in 1996.

In Nigeria the Endangered Species Act of 1985 is the legal instrument through which the international treaties are enforceable. All wildlife in National Parks is protected by law.

In Cameroon, law n° 94/01 (1994) sets out the country's forestry, wildlife and fishery regulations, and list gorillas as Category A species, which are fully protected against hunting, capture, or sale; in whole or in part. Protected areas such as national parks and wildlife reserves may be established under the auspices of the Direction de la Faune and des Aires Protégées (DFAP) of the Ministry of Forestry and Wildlife (MINFOF), which is also responsible for the protection of the country's biodiversity in general.

# 6. Conservation measures

## 6.1 National protection status

National laws for control of hunting and capture exist in all countries with gorilla populations, but lack of funds and inaccessibility make wide enforcement of this legislation rare.

Most of the Cross River gorillas occur within forest reserve, Wildlife sanctuary or national parks, they and their habitat have some degree of protection. However, some localities (Mbe in Nigeria and Mbulu, Tapke/Awuri and Bechati areas in Cameroon) are only poorly protected at the moment.

In Cameroon, the Takamanda Forest Reserve and Mone Forest Reserve are formally established protected areas. The Takamanda Forest Reserve is currently being upgraded to a National Park while Mone Forest Reserve could be given out as a logging concession unless it is also upgraded.

In Nigeria, the Cross River gorillas are recorded in the Afi Mountain Wildlife Sanctuary of the Afi River Forest reserve, in the Mbe Mountains community forest, and in the Okwangwo Division of the Cross River NP.

A transboundary protected area have been proposed and would unite the Okwangwo Division of Cross River National Park with Cameroon's Takamanda Wildlife Reserve.

**Table 1. Priority Populations for Cross River Gorillas (*G. g. diehli* )**

| Country Countries | Population Name | Pop. Size | Area Km2 | Habitat Type(s) | Habitat or Biogeographic Uniqueness | Land Use Status | Scientific Importance | Other Important Conservation Features | Major Threats | Rationale for Prioritization |
|---|---|---|---|---|---|---|---|---|---|---|
| Nigeria | Afi Mountain | Approx 25-30 | 100 | Lowland to montane forest | Westernmost of all *G. gorilla* populations | Wildlife Sanctuary | Long-term Monitoring | Part of global hotspot for species richness And endemism for a wide range of taxa; Many endangered and Vulnerable species; sympatric with *P. t.vellerosus* | Hunting, Conversion of forest for agriculture, isolation | Westernmost gorilla pop; protected area; sympatric with Chimpanzees; potential for habituation; support of state government |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nigeria | Mbe Mountain | Approx 25-30 | 85 | Lowland to submontane forest | | Proposed Community Wildlife Sanctuary | | | | |
| Nigeria/ Cameroon | Takmanda-Okwangwo | Approx 70-115 | 1,350 | Lowland to montane forest, montane grassland | Contains an Altitudinal gradient from 100m to above 1600m; largest continuous block of habitat | Mixed National Park, Forest Reserve, and Ungazetted land | Long-term Monitoring of Mbe and Boshi Extension Subpopulations in Nigeria | Part of global hotspot for species richness And endemism for a wide range of taxa; Many endangered and Vulnerable species; sympatric with *P. t. vellerosus* | Hunting, Conversion of forest for Agriculture, Fragmentation | Largest CR gorilla Population; large legally Protected area, largest Continuous block of habitat; sympatric with Chimpanzees; potential for population Expansion; support of state and federal Government |
| Cameroon | Mone-Mbulu-Kagwene | Approx 60-90 | 1350 | Lowland to montane forest, montane grassland | Contains an altitudinal gradient from 100m to 2000m Contains highest altitude *G.g.diehli* population | Forest reserve, Wildlife sanctuary and Ungazetted land | On-going Research | Part of global hotspot For species richness and endemism for a wide range of taxa; many endangered and vulnerable species; sympatric with *P. t. vellerosus* | Hunting, Conversion of forest for Agriculture, Fragmentation | Second largest pop; High altitude; some protection; low levels of human disturbance; ongoing Research and Potential for habituation; Sympatric with Chimpanzees; potential for pop expansion; Support of state and federal government |
| Cameroon | Bechati | 20-30 | 80-100 | Lowland to mid-elevation forest | | Ungazetted land | | Part of global hotspot For species richness and endemism for a wide range of taxa; many endangered and vulnerable species; sympatric with *P. t. vellerosus* | Hunting, Conversion of forest for Agriculture, isolation | Important survey area; Sympatric with Chimpanzees |

### 6.2 International protection status

The gorilla, *Gorilla gorilla sl*, is listed in CITES Appendix I since 1st July, 1975, and all Range States are Parties. The gorilla is listed in Class A of the African Convention on the Conservation of Nature and Natural Resources (1969).

The Cross River Gorilla, *Gorilla gorilla diehli*, is part of *Gorilla gorilla sensu lato* and as such listed in Appendix I of the Convention on Migratory Species (CMS).

### 6.3 Additional protection needs

Establishing a trans-boundary protected area for the Takamanda-Okwangwo complex, in particular by upgrading the protection status of the Takamanda Forest Reserve, developing land-use plans for the Takamanda-Mone-Mbulu area in Cameroon, including a network of protected areas and corridors and a plan for the conservation of Afi-Mbe-Okwangwo area in Nigeria, including both a review of the management status for the Mbe Mountains and the maintenance of forested connections between gorilla habitats.

Strengthening protection and law enforcement measures for all Cross River gorilla populations.

Maintaining and expanding basic research into the ecology, distribution and population biology of the Cross River Gorilla, building the capacity of relevant institutions in Nigeria and Cameroon (including Government departments, universities, NGOs).

Strengthening and expanding conservation education and awareness programmes at all levels, incorporating local community needs into the development of management strategies, including the study of alternative livelihoods options (tourism).

Implementation of recommendations from International Primatology Society, concerning Ebola epidemies.

## 7. Additional Remarks

## 8. References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