

GORILLA GORILLA DIEHLI

TAXONOMY AND NOMENCLATURE

1.1. Taxonomical remark



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The taxonomy currently followed by CMS (Wilson & Reeder, 2005) recognises two species of gorilla. There are two subspecies of western gorilla *Gorilla gorilla*: the western lowland gorilla *Gorilla gorilla gorilla* and the Cross River gorilla *Gorilla gorilla diehli*.

The eastern and western species are separated by approximately 1,000 km (Garner & Ryder, 1996). Western and eastern gorillas can be distinguished by external features (Groves, 2002), together with clear geographic and morphological distinctions (Garner & Ryder, 1996).

The following document summarises the conservation status of the Cross River Gorilla, *Gorilla gorilla diehli*, a 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 what is now Gabon. The name was derived from a Greek translation of the word Gorillai (a "tribe of hairy women"), described by Hanno the Navigator, a Carthaginian explorer who led a voyage (circa 480 BC) around the coast of West Africa, passing an active volcano (only Mt Cameroon fits the description) before encountering the 'Gorillai'. There is much academic debate over whether the 'hairy women' he saw is what we know as gorillas today.

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.

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

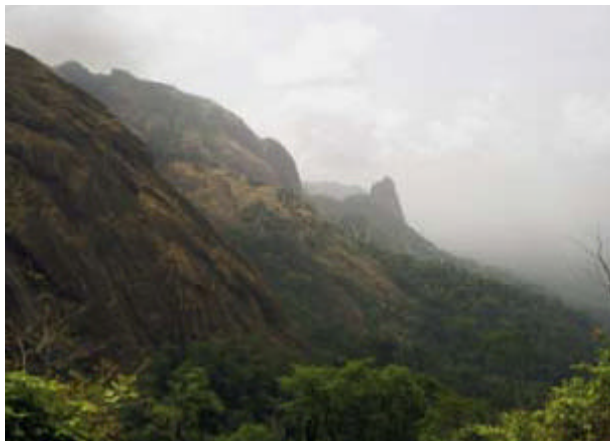
Spanish - Gorila del Cross River

1.2.4 Description

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 locomote 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, silverbacks (adult males) 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 could also be associated with lower fruit abundance in habitats at high elevations, or/and fruit scarcity periods during prolonged 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.





Jacqueline Sunderland-Groves & John F. Oates



1. BIOLOGY OF THE SUBSPECIES

2.1 General Biology

Gorillas are mainly terrestrial. Their large body 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 with the same adult individuals travelling together for months and usually years at a time. Because gorillas are mainly foliage eating they can afford to live in 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 more frequently, 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 dwelling species. Cross River gorillas inhabit 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).

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 from human settlements. *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 milanjanus*, and at the highest elevations (up to 2000m) 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 it is possibly best suited, has been converted to grassland by a long period of human occupation (cultivation, burning, cattle grazing) and so is no longer available.

It is not obvious that the Cross River gorillas have strong habitat preferences within their present range. They occur at altitudes between 100-2,000m but their present distribution seems to correlate more with human pressure and slope than with habitat types. In Nigeria they live primarily in the rugged terrain of the Afi and Mbe mountains and at the headwaters 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 Cameroon their nests are found in high concentrations only in a number of hilly areas (200-2,000m) in the Takamanda, Mone and Mbulu forests. Among these areas 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 and wary of humans 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. No attempts to habituate gorillas have been made given the animals are so few and still vulnerable to hunting.

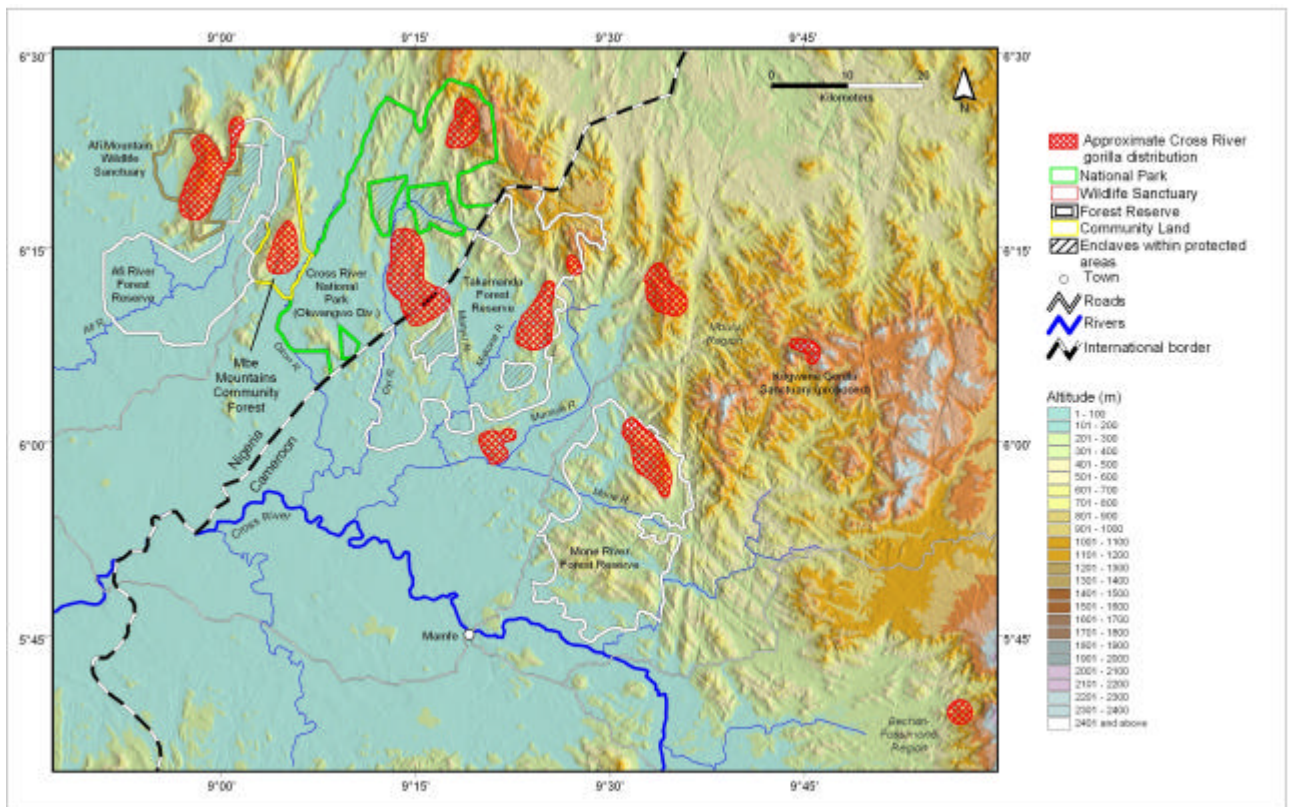
As far as group structure is concerned, gorillas do form harems. Adult females in a social group are mostly unrelated, and the social ties that exist between them are weak. Groups typically contain one adult male (a silverback). In contrast to many other primates, it is the bond between each individual 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 (Parnell, 2002).

2.2 Distribution (current and historical)

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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 (Bergl and Vigilant 2007). 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 western lowland 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 of their small population size and their vast range. Population counts and estimates of gorillas are commonly carried out on the basis of nest site counts (e.g. Kühl *et al.*, 2008). Adults and immature weaned

© Cross-River Gorilla habitat. African Conservation

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.

The Cross River gorilla has probably had a restricted range for some 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.

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 suggested that there were probably no more than 200 individuals in four isolated subpopulations. Following long-term surveys established in the late 1990's (Sunderland-Groves & Maisels, 2003) it is now thought that up to 300 of these animals survive. Within Cameroon they are more widespread than previously thought (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 Cross River gorilla (*Gorilla gorilla diehli*) is listed as Critically Endangered (**IUCN 2008, CR A4cd**) and is found in 11 localities on the Nigerian-Cameroon border, most of them connected by large tracts of continuous forests.

2.4. Migrations

Some patterns of seasonal movements 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). Most of observations at other location suggest that the gorillas tend to stick to a relatively stable range across the seasons (Sunderlands, comm pers.).

Transnational dispersion should at least have occurred in the past when distribution was more continuous and recent field surveys, in border locations, suggest that 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 the Cross River gorilla's closest relative the western lowland gorilla indicate that group home ranges average 5.6 to 15.4 sq. km. Gorillas do not display territorial behaviour, and neighbouring groups often overlap ranges (Bermejo, 2004, Doran *et al.*, 2004). A group usually favours a core area within the home range but seems to follow a seasonal pattern depending upon the availability of ripening fruits. Gorillas normally travel 0.5-2.0 km per day (Doran *et al.*, 2004). Of the two long-term ecological studies on Cross River gorillas at Afi Mountain in Nigeria and at Kagwene Mountain in Cameroon, mean day range at both sites was roughly 1km per day. Annual range at Afi was 31km² and at Kagwene approximately 19km² (with some areas infrequently used).

The remaining populations are now confined to highland areas within a larger area of more-or-less continuous forest. This large forest block is becoming fragmented in some areas. Transboundary protected areas and corridors between the isolated populations have been proposed as important conservation measures.

3. CONSERVATION STATUS, BY PARTY

Nigeria (Critically Endangered): the isolated Nigeria-Cameroon gorillas have recently been recognised as a subspecies, the Cross River gorilla (*Gorilla gorilla diehli*). In Nigeria there are approximately three localities 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 from the 100 individuals in the Takamanda Forest Reserve, located in the South West Province of Cameroon. However, as research extended into the adjacent Mone River 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 (Groves, 2002). Recently the number of Cross River gorilla in Cameroon has been 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.

4. ACTUAL AND POTENTIAL THREAT

The major threats affecting or having affected Cross River Gorilla populations are (1) habitat loss or modification, (2) direct killing (for the bushmeat 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).

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

Habitat loss is a major threat to gorillas as forests are rapidly being lost to local illegal logging 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 about 4,000 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.

In Nigeria and in Cameroon the expansion of agriculture, oil palm plantations, and road networks has led to the widespread degradation and fragmentation of great ape habitat .



©Cross-River Gorilla habitat. *African Conservation*

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 one 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, by a Wildlife Conservation Society (WCS) programme. 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 five years (Oates et al., 2002).

- **The bushmeat trade**

If habitat loss or degradation is the major threat to the Cross River gorilla population, 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**

Gorillas have been killed for consumption, but in Cameroon local tradition dictates that gorilla meat cannot be sold and therefore less emphasis was placed on gorilla hunting. Bones are used in traditional medicines in both Cameroon and Nigeria and skulls are typically retained as a trophy with much kudos attached to the hunter responsible. Hands or feet do not seem to be particularly valued. Infants have been sold (Nyango at the Limbe Wildlife Center is an example) but it seems to be more of an opportunistic event.

4.3 Diseases

Another potential general threat to gorillas is exposure to human diseases, particularly for habituated gorillas that come into contact with humans, in areas of gorilla tourism (Butynski, 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 an evaluation of habituation for ecotourism has recently been completed at Afi Mountain Wildlife Sanctuary (Andrew Dunn, comm. pers.). Strict rules will be needed to regulate tourist visits, including the number of tourists per group, limiting the approach of humans to 7 m, burying human excrement deeper than 30 cm (Homsy, 1999). Similarly, the WCS Global Health Program is also helping evaluate and suggest ways to minimize the risks of disease transmission between humans (including villagers and researchers) and livestock and the gorillas of the Kagwene Gorilla Sanctuary in Cameroon.

Beside severe impacts on human populations, several outbreaks of the Ebola virus since 2000 might have claimed thousands of great apes in Africa. Ebola hemorrhagic fever is a severe, often fatal disease that affects humans, 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. So far Cross River gorillas have not been affected by Ebola but this could change.

4.4 Impact of Conflict

The 1960s-1970s Nigerian civil war could have negatively affected the Cross River gorilla but there is no evidence of this.

4.5 Other threats

Road development between Mamfe and Akwaya will possibly split the Cross River gorilla populations in Mone Forest Reserve and the proposed Takamanda National Park.

Accidental entrapment in wire snares used to trap other wild animals can also threaten 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*. This threat needs to be assessed in Nigeria-Cameroon border region.

The potential isolation of some localities and low numbers of Cross River gorilla populations have given rise to concerns about inbreeding but recent genetic data suggest that exchange between subpopulations persists (Bergl & Vigilant, 2007) and that genetic diversity remains at an acceptable level (Bergl et al. 2008).

International trade in live gorillas and gorilla parts 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 on 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 Cross River gorillas occur within forest reserves, wildlife sanctuaries and 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) currently lack any formal protection status.

In Cameroon, the Takamanda Forest Reserve, Mone Forest Reserve and Kagwene Gorilla Sanctuary are all formally protected, although to differing degrees on the ground. Takamanda and Mone were created as Forest Reserves during the colonial period for future timber exploitation. The Takamanda Forest Reserve is currently being proposed to be a National Park. The status of the Mone Forest Reserve is being reviewed (it has been selected as a GrASP pilot study site to evaluate potential REDD mechanisms).

In Nigeria, Cross River gorillas are found 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 has been proposed which would unite the Okwangwo Division of Cross River National Park with Cameroon's (proposed) Takamanda National Park.

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 on 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 on Appendix I of the Convention on Migratory Species (CMS).



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One of the only pictures of Cross River Gorilla taken in the wild

6.3 Additional protection needs

Establishment of a transboundary protected area for the Takamanda-Okwangwo complex, 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 some formal conservation status for the Mbe Mountains (most likely a community wildlife sanctuary) 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.

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 <i>G. gorilla</i> 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 <i>P. t. vellerosus</i>	Hunting, Conversion of forest for agriculture, isolation, habituation	Westernmost gorilla pop; protected area; sympatric with Chimpanzees; potential for habituation; support of state government
Nigeria	Mbe Mountain	Approx 3035	85	Lowland to submontane forest		Proposed Community 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 <i>P. t. vellerosus</i>	Hunting, Conversion of forest for agriculture,	Support of local communities, acts as a corridor linking Afi to Okwangwo, sympatric with Chimpanzees,
Nigeria/ Cameroon	Takmanda-Okwangwo	Approx 70-115	1,325	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 <i>P. t. vellerosus</i>	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	1550	Lowland to montane forest, montane grassland	Contains an altitudinal gradient from 100m to 2000m Contains highest altitude <i>G.g.diehli</i> 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 <i>P. t. vellerosus</i>	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	Kagwene	Approx 17-19	19.4	Montane forest	High quality montane forest up to 2,000m	Wildlife Sanctuary	Daily monitoring presence since 2002	Exceptional bird diversity, botanical surveys planned for near future and likely to also highlight important species	Habitat loss and fragmentation as a result of farming and grassland burning	Long-term study site. Eastern genetic sub-division. High quality montane habitat and strong local support for conservation
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 <i>P. t. vellerosus</i>	Hunting, Conversion of forest for Agriculture, isolation	Important survey area; Sympatric with Chimpanzees

7. ADDITIONAL REMARKS

8. REFERENCES

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