Gorilla Biology

A Multidisciplinary Perspective

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1 *An introductory perspective: Gorillas – How important, how many, how long?*

RUSSELL H. TUTTLE

Gorillas rank highly among elephants, pandas, whales, polar bears, lions, orangutans, and other large mammals as awe-inspiring representatives of *natura naturans* (nature as creative) and *natura naturata* (nature as created). Like unique, imaginative, stimulating literature (Booth, 1988), one cannot encounter them without being changed in ways that are not easily explained. Indeed, attempts to do so can dilute the wonderful effect of having been in their presence. Earth will be a poorer planet if we lose its remaining, already impoverished, continental megafaunae and multifarious smaller beings and their natural habitats. The urgent pedagogical task of ecologists, educators, conservationists, policymakers, and politicos is to generate appreciation for gorillas and a sense of local and national pride in having gorillas among indigenous peoples upon whom the stewardship of natural diversity is ultimately dependant (Tuttle, 1998).

Gorilla taxonomy is important for meaningful communication and reference, but questions over how many species or subspecies *Gorilla* comprises should be secondary to full descriptions of the morphological, genetic, social, demographic, and ecological diversity of gorilla populations and sample specimens in museums and private collections. The best chance for their survival lies in preserving genetic variety, behavioral plasticity, and a broad geographic distribution in sustainable habitats, some of which should probably be allowed to expand in Africa. This volume is but a small step in the right direction – documenting the diversity of gorillas – but unfortunately this may be the only way that we can progress given the politico-economic status of most countries that are still blessed with gorilla populations.

There is no consensus regarding the number of species and subspecies of *Gorilla* among the authors who analyzed the large data set of cranial features collected by Groves (1967, 1970, 1986; Groves and Humphrey, 1973; Groves and Stott, 1979) and subsets and augmented subsets of it. Inouye provides the only analysis of postcranial features, viz., in the forelimb skeleton, to complement the analyses of cranial skeletal traits. Consequently, the morphological

Table 1.1. *Summary of hypotheses on the species and subspecies of* Gorilla *in Chapters 1–6*

Author	Hypothesis	Method
Groves	**Two species** (*Gorilla beringei* and *G. gorilla*) and probably **four subspecies** (*Gorilla beringei beringei, G. b. graueri, G. gorilla gorilla, G. g. diehli*)	Canonical discriminant function analyses of male skulls
Stumpf *et al*.	**Two species** (*Gorilla beringei* and *G. gorilla*) and noncommittal re subspecies, but do not counter Groves' system	Canonical variates analyses, Mahalanobis D^2; and canonical variates analyses on size-adjusted measurements of male and female skulls
Albrecht *et al*.	**One species** (*Gorilla gorilla*) and **four subspecies** (*G. gorilla gorilla, G. g. diehli, G. g. beringei, G. g. graueri*)	Principal components analysis of male and female skulls
Leigh *et al*.	**One species** (*Gorilla gorilla*) and **three subspecies** (*G. gorilla gorilla, G. g. beringei, G. g. graueri*), with high diversity among *G. gorilla gorilla*	Wright's F_{ST} and discrete trait analyses on male and female crania
Taylor	**One species** (*Gorilla gorilla*) and **three subspecies** (*G. gorilla gorilla, G. g. beringei, G. g. graueri*)	Principal components and ordinary least-squares regression analyses on log-transformed data from ontogenetic series of male and female skulls
Inouye	**One species** (*Gorilla gorilla*) and noncommittal re subspecies	Ontogenetic, allometric analyses of female and male forelimbs

profiles of subgeneric taxa of *Gorilla* are incomplete, lacking epidermal features and variations in muscles, ligaments, viscera, bodily proportions and much of the postrcranial skeleton. In addition to fleshing out this database, it would be useful to have genetic profiles of reliably provenanced museum specimens, based on hair and collagen samples, to compare with samples from living populations.

Groves and Stumpf *et al*. accept two species of *Gorilla*, while Albrecht *et al*., Leigh *et al*., Taylor and Inouye subscribe to a monospecific scheme (Table 1.1). Like Butynski (2001), Groves and Stumpf *et al*. acknowledge molecular genetic evidence that support specific status for *Gorilla gorilla* and *Gorilla beringei* (Ruvolo *et al.*, 1994; Garner and Ryder, 1996; Uchida, 1996; Ryder *et al*., 1999).

Among the authors who comment on subspecific taxa of *Gorilla* (Table 1.1), all accept at least three subspecies, and Groves and Albrecht *et al*. endorse a fourth subspecies (*Gorilla gorilla diehli*).

None of the authors presented a scheme of common names for subgeneric taxa of *Gorilla*. I propose that we adopt the following scheme based on Groves (2001:300–303), and urge editors and authors to employ it henceforth:

western gorilla	*Gorilla gorilla gorilla*
Cross River gorilla	*Gorilla gorilla diehli*
mountain gorilla	*Gorilla gorilla beringei* and *Gorilla beringei beringei*
grauer gorilla	*Gorilla gorilla graueri* and *Gorilla beringei graueri*

The decimation of gorillas due to the bushmeat trade, trophy and subsistence hunting, and deforestation is reducing genetic variation in the genus, and there is little evidence of naturalistic genetic recombination among gorillas in widely dispersed habitats. The less they are variable, the more they might be vulnerable to pandemic diseases, particularly from human repositories as contacts with humans, including indigenous peoples, researchers, conservators and tourists, increase. Sadly, one must wonder how much longer they will survive as natural beings in the twenty-first century.

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