

Status Survey and Conservation Action Plan
Revised Edition

African Primates

Compiled by John F. Oates



IUCN/SSC Primate Specialist Group

IUCN
The World Conservation Union

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Tel: + 41 22 999 00 01; Fax: + 41 222 999 00 10; E-mail: mail@hq.iucn.ch

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SPECIES SURVIVAL COMMISSION



Sultanate of Oman



Chicago Zoological Society



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Executive Summary

This is a fully revised edition of the Action Plan for Primate Conservation, first published by the IUCN/SSC Primate Specialist Group in 1986. The plan deals with the primates of continental Africa, excluding Madagascar.

Sixty-four species (15 prosimians, 46 monkeys and 3 apes) are recognized in the plan, which takes account of new taxonomic research.

A revised system is used to rate species for conservation action. Species are rated on a scale of 1-5 for the degree of threat they face, and either 1 or 2 points are added based on their taxonomic distinctiveness. The threat ratings are compatible with, but not identical to, new IUCN categories. Under this rating system, the drill (*Mandrillus leucophaeus*) is the highest-ranked species for action.

This plan gives more attention to threatened subspecies. Forty-three subspecies and distinct local populations are identified as deserving of special conservation attention and are prioritized for action. Of 12 subspecies with the highest rating, six are red colobus monkeys.

As in the previous plan, important sites for conservation action are identified based on the recognition of distinct regional communities. Eleven such communities

are listed. Most of these are tropical forest communities with high levels of species richness and endemism.

The original plan listed 42 projects across 11 regional communities. These projects included both basic surveys and reserve management schemes. The new plan reviews what action has been taken on these projects in the last 10 years: some action has been taken on 38 projects, but in 10 cases this action has been interrupted by civil war or other political instability, a growing impediment to effective conservation in Africa.

Based on this project review, specific recommendations for further action are made. Twenty-four projects are identified as of very high priority, but in six of these cases political factors mitigate against immediate research or conservation efforts.

In addition to further action in previously identified areas, three new areas with endemic primates are recognized as requiring attention. These are southern Somalia, Benin and the Niger Delta.

Given the large number of highly localized and threatened populations of red colobus monkeys, it is recommended that a Red Colobus Conservation Action Plan be prepared and implemented.



S. Bearder

The Rondo dwarf galago was first found in 1952 but has only recently been recognized as probably a distinct species. It is known only from the Lindi and Newala Districts of SE Tanzania.

Introduction

This is a revised edition of the Action Plan for African Primate Conservation: 1986-90 published by the IUCN/SSC Primate Specialist Group (PSG) in 1986. That was the first in a long and continuing series of IUCN/SSC Action Plans. Now, some 10 years after the first plan was written, it seems worthwhile to review the recommendations in the original plan, in the light both of conservation actions taken since that plan was published and of new findings on Africa's primates and their environments. Like the original plan, this new edition covers the African mainland and the islands on the continental shelf; it does not encompass Madagascar, for which a separate plan has been prepared (Mittermeier *et al.* 1993).

The Primate Specialist Group is one of several groups of experts providing technical advice to the Species Survival Commission of the World Conservation Union (IUCN). The PSG has set itself as a main goal the maintenance of the current diversity of the order Primates, with a dual emphasis on: (1) ensuring the survival of endangered and vulnerable species wherever they occur; and (2) providing effective protection for large numbers of primates in areas of high primate diversity and/or abundance.

Human activities make it inevitable that many of the world's primate populations and their habitats will disappear. The Primate Specialist Group feels that, with respect to action directed specifically at primate populations and their habitats, these losses can best be mitigated by: (1) setting aside protected areas for endangered and vulnerable species; (2) creating large national parks and reserves in areas of high primate diversity and/or abundance; (3) maintaining or increasing the effectiveness of parks and reserves that already exist; and (4) creating and increasing public awareness of the need for primate conservation and the importance of primates both as a part of the natural heritage of the countries in which they occur, and as important components in systems whose proper functioning is vital for human well-being.

The principles underlying these goals are that effective habitat conservation is essential if wild populations are to survive in the long term, and that conservation programs will not work effectively if people living in the areas where primates occur do not support conservation efforts.

As a scientific advisory group, we feel that the most appropriate actions the Primate Specialist Group can take to help in achieving its goals are to establish the current patterns of diversity and distribution of the African primate fauna, to study and describe the threats faced by primate populations, to assist in the development of management

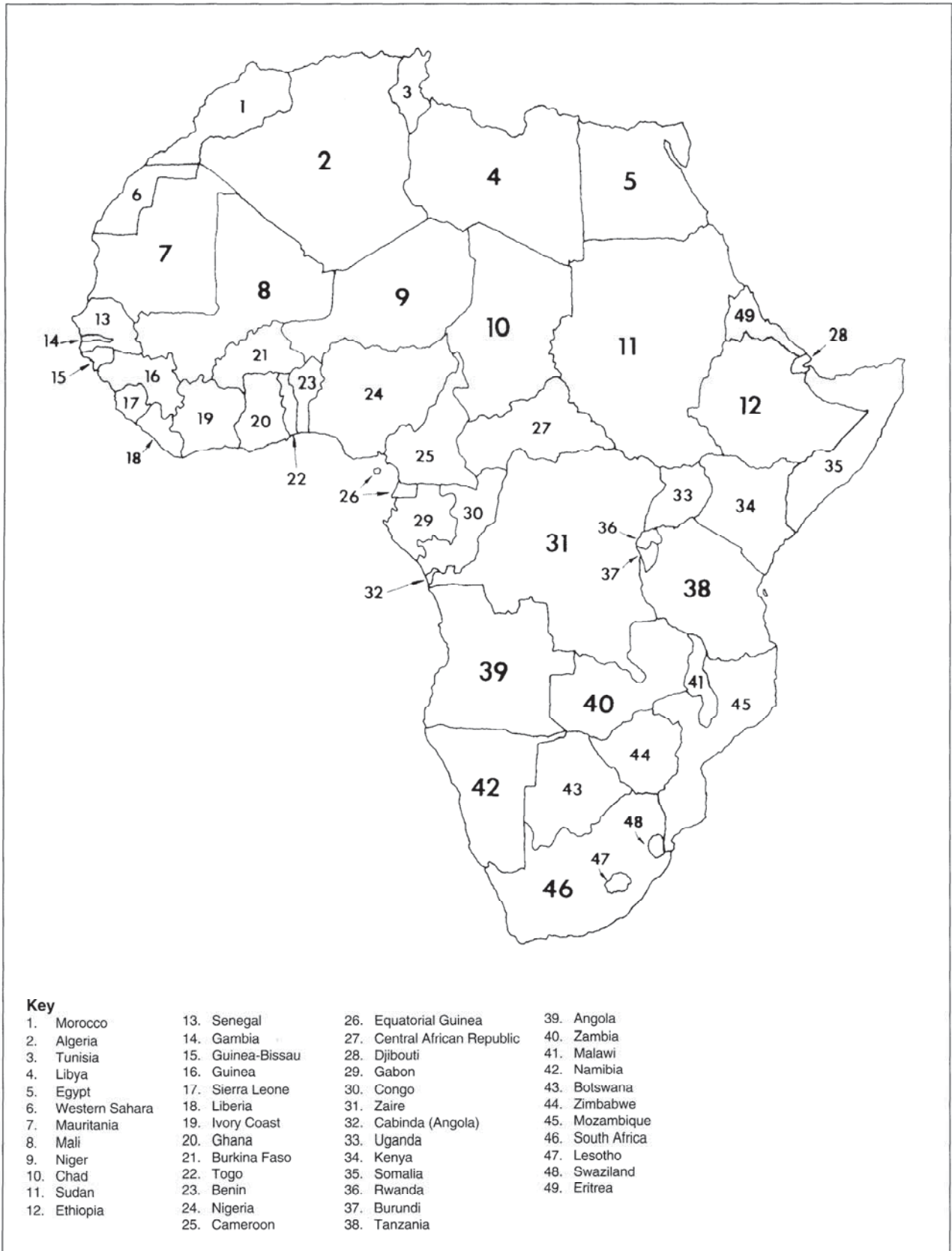
recommendations for threatened populations, and to establish priorities among specific projects aimed at conserving Africa's primates. These projects include basic surveys where the distribution and status of primate populations are judged to be poorly known, and the establishment and management of protected areas. While our ideal is the creation of many large, strictly-protected reserves in representative biogeographic regions, we recognize that in some cases it is going to be impossible in practice to create and maintain such reserves. In these cases we must determine what forms of multiple-use management do the least damage to primate populations and encourage the implementation of such management.

Although this plan concentrates on establishing priorities for surveys and reserve management programs, we do not wish to minimize the great importance of increasing public awareness in Africa of the need for, and value, of conservation. We also see a continuing need for effective training programs for scientists and managers from African countries. Long-term field research projects have been found to be a very effective means of achieving many of these goals.

This plan follows the general format of the original plan, but incorporates some new material. Like the 1986 plan, this revision begins with a list of African primate species and an assessment of the relative degree of threat faced by each. The list of species has been modified in light of new research findings, and the threat-rating system has been changed. This new plan also pays more attention to subspecies and other distinct local populations. The new plan, like the first, reviews the distribution of distinct African primate communities, paying special attention to communities with high levels of species richness and/or endemism.

Rather than just repeating the list of projects recommended in the original plan, this new edition provides a summary review of progress on each of these projects. It then gives a set of new recommendations for future action based both on project goals set out in the original plan that are still unfulfilled, and on the need for new projects in areas or on populations not included in the first plan.

The plan is transnational in its scope. It considers what action is needed to maintain the diversity of primates on a continent-wide basis. It does not specifically address national concerns. Within some countries, one or a few primate species that are common elsewhere may be rare or threatened. In a transnational plan of this sort these cases are not given special attention, but they may be of great importance in national conservation planning.



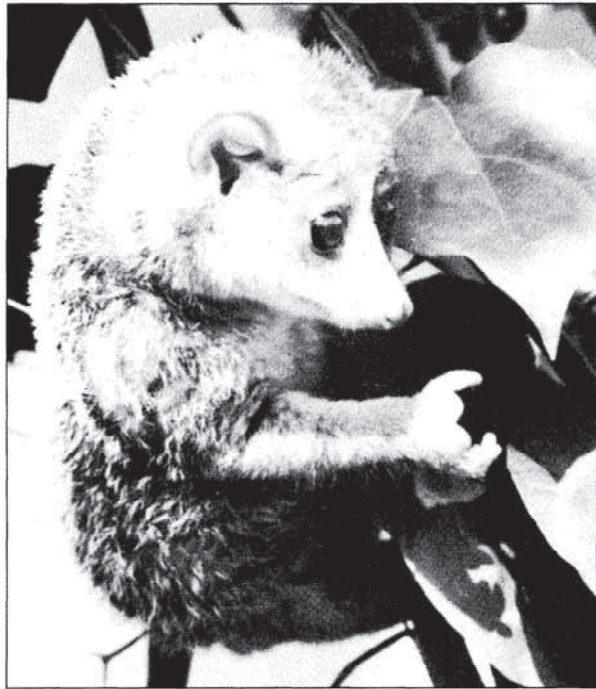
Map 1. The nations of Africa. Primate species lists for the 25 countries which have ten or more primate species are given in Appendix 1.

Classification

Several changes have been made in the species-level classification followed in the original action plan, although the classification (Table 1) retains its conservative approach and a moderate bias towards splitting rather than lumping. Sixty-four species are listed, compared with 63 in the earlier plan. The changes and their rationale are as follows:

Pottos

The angwantibo (*Arctocebus*) is divided into two species, *A. calabarensis* north of the Sanaga River and *A. aureus* to the south, following Maier (1980) and Groves (1989). As this plan went to press, a new potto-like taxon, *Pseudopotto martini*, was named by Schwartz (1996) on the basis of two skeletal specimens in a Zurich museum. The specimens originated in western equatorial Africa.



P. Jewell

The angwantibo (*Arctocebus calabarensis*) is a short-tailed, careful climber, related to the potto and the Asian lorises. It is one of the rarest of African prosimians.

Galagos

Because of uncertainties about galago systematics at the time of publication of the original plan, all the galagos were placed in the genus *Galago*. There is now a much broader consensus, which is followed here, that the greater galagos should be placed in their own genus, *Otolemur*; that the dwarf galagos also belong in their own genus, *Galagoides*; and that the western (but not eastern) needle-clawed galagos should be placed in *Euoticus* (see Groves 1989 and Bearder *et al.* 1995).

Some additional galago species are recognized based on studies by Olson (1979), the review by Groves (1989), and the continuing research by Bearder *et al.* (1995) on vocalizations. In addition to acknowledging the distinctiveness of *Galagoides thomasi* from *G. demidoff* (the correct name for *G. demidovii*), as in the original plan, *G. gallarum* and *G. moholi* are regarded as distinct from *G. senegalensis*, following Olson (1979), Groves (1989) and Nash *et al.* (1989). Two species of *Euoticus* are recognized: *E. elegantulus* south of the Sanaga River and *E. pallidus* to the north and on Bioko (Groves 1989). *Galago inustus* is given its correct name of *G. matschiei* (Groves 1989; Nash *et al.* 1989).

The vocalization studies of Bearder *et al.* (1995) suggest that there are three, or even four, different kinds of Allen's galago. Pending a thorough taxonomic review, we retain a single-species classification here, but we recognize that there is probably more than one valid species in this group. Bearder *et al.* have also argued that vocal evidence suggests the presence of several previously unrecognized galago species in Tanzania and Malawi; they have drawn attention to three forms of dwarf galago in Tanzania (the Matundu, Rondo and Amani dwarf galagos) that appear to merit species status based on their calls, and to two small galagos from Tanzania (Newala) and Malawi (Kalwe) that have similarities to *G. zanzibaricus*, but also have vocal differences. Because of the state of flux in galago taxonomy, these "new" galagos are not formally recognized here, but such diversity clearly needs to be acknowledged in future planning.

Table 1
Classification of African Primates

Family Lorisidae

Subfamily Lorisinae

Arctocebus calabarensis
Arctocebus aureus
Perodicticus potto

Angwantibo
 Golden potto
 Potto

Subfamily Galaginae

Otolemur crassicaudatus
Otolemur garnettii
Galago alleni
Galago matschiei
Galago senegalensis
Galago gallarum
Galago moholi
Galago zanzibaricus
Galagoides demidoff
Galagoides thomasi
Euoticus elegantulus
Euoticus pallidus

Large-eared greater galago
 Garnett's, or small-eared, greater galago
 Allen's galago
 Eastern needle-clawed galago
 Senegal galago
 Somali galago
 Mohol galago
 Zanzibar galago
 Demidoff's dwarf galago
 Thomas's dwarf galago
 Elegant needle-clawed galago
 Pallid needle-clawed galago

Family Cercopithecidae

Subfamily Cercopithecinae

Macaca sylvanus
Cercocebus atys
Cercocebus torquatus
Cercocebus galeritus
Lophocebus albigena
Lophocebus aterrimus
Mandrillus sphinx
Mandrillus leucophaeus
Papio papio
Papio anubis
Papio cynocephalus
Papio hamadryas
Papio ursinus
Theropithecus gelada
Cercopithecus diana
Cercopithecus dryas
Cercopithecus neglectus
Cercopithecus hamlyni
Cercopithecus lhoesti
Cercopithecus preussi
Cercopithecus solatus
Cercopithecus albogularis
Cercopithecus mitis
Cercopithecus nictitans
Cercopithecus petaurista
Cercopithecus sclateri
Cercopithecus erythrogaster
Cercopithecus erythrotis
Cercopithecus cephus

Barbary macaque
 Sooty mangabey
 Red-capped mangabey
 Crested mangabey
 Grey-cheeked mangabey
 Black mangabey
 Mandrill
 Drill
 Guinea baboon
 Olive baboon
 Yellow baboon
 Hamadryas baboon
 Chacma baboon
 Gelada
 Diana monkey
 Dryas monkey
 De Brazza's monkey
 Owl-faced monkey
 l'Hoest's monkey
 Preuss's monkey
 Sun-tailed monkey
 Sykes's monkey
 Blue monkey
 Putty-nosed monkey
 Spot-nosed monkey
 Sclater's monkey
 White-throated monkey
 Red-eared monkey
 Moustached monkey

Continued on next page.

Subfamily Cercopithecinae (Continued)

Cercopithecus ascanius
Cercopithecus campbelli
Cercopithecus mona
Cercopithecus pogonias
Cercopithecus wolfi
Cercopithecus aethiops
Miopithecus talapoin
Miopithecus sp.
Allenopithecus nigroviridis
Erythrocebus patas

Red-tailed monkey
Campbell's monkey
Mona monkey
Crowned monkey
Wolf's monkey
Green monkey
Southern talapoin
Northern talapoin
Allen's swamp monkey
Patas monkey

Subfamily Colobinae

Procolobus verus
Procolobus badius
Colobus polykomos
Colobus vellerosus
Colobus guereza
Colobus satanas
Colobus angolensis

Olive colobus
Red colobus
Western black-and-white colobus
White-thighed black-and-white colobus
Guereza
Black colobus
Angolan black-and-white colobus

Family Pongidae

Pan troglodytes
Pan paniscus
Gorilla gorilla

Chimpanzee
Pygmy chimpanzee
Gorilla

Baboons and Mangabeys

We have retained a 5-species classification of the baboons (*Papio*). Although Jolly (1993) has argued forcefully that the baboons are best regarded as a single species, a five-species arrangement is still widely used and has some support in recent research (Hayes *et al.* 1990).

The mangabeys are divided into two genera, *Cercocebus* (including *galeritus*, *atys* and *torquatus*) and *Lophocebus* (including *albigena* and *aterrimus*), following Groves (1978, 1989). Molecular data apparently support this generic split (T. Disotell, personal comm.). Groves regards *galeritus* on the Tana River as a species distinct from Central African *agilis*; we have not followed this arrangement here, and await further research and a clarification of the status of the Udzungwa population in Tanzania. Groves also unites *albigena* and *aterrimus* in one species (*L. albigena*), but also says that to recognize one species or three (*albigena*, *aterrimus* and *opdenboschi*) "is a somewhat arbitrary division". Pending further study, we retain the more familiar two-species classification used by Napier (1981).



A young mountain gorilla (*Gorilla gorilla beringe*).

Amy Vaccder/Bill Weber

Guenons

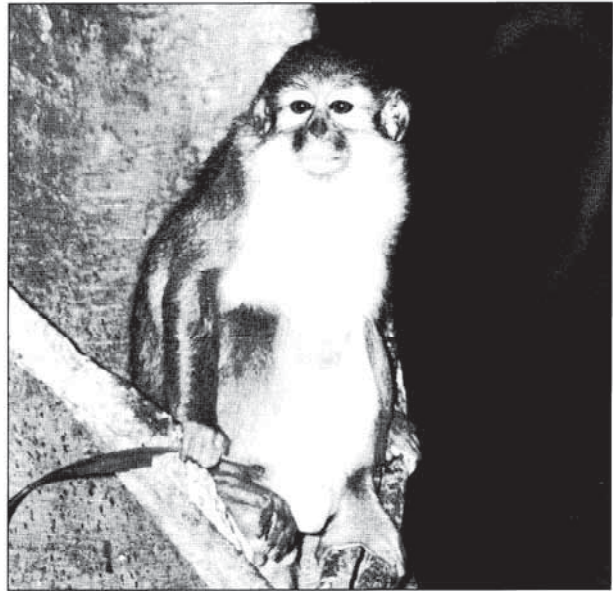
The study of Colyn *et al.* (1991) has concluded that the central Zairean guenons *Cercopithecus salongo* and *C. dryas* are the same species. The name *dryas* has priority. This new plan therefore replaces "*C. ?salongo*" with *Cercopithecus dryas*. "*Cercopithecus ?sp.*" from Gabon has now been formally named *Cercopithecus solatus* (Harrison 1988). *Cercopithecus sclateri* was provisionally accepted as a distinct species in the first plan; it is now fully accepted, in light of new information (Oates *et al.*, 1992). *Cercopithecus wolffi* (including the subspecies *wolffi*, *pyrogaster*, *elegans*) is now treated as a full species, distinct from *C. pogonias*. This follows the conclusions of several studies reported in the benchmark volume on the guenons, edited by Gautier-Hion *et al.* (1988), and by the phylogenetic analysis of Gooder (1991). Gooder notes three derived cranial and dental characters separating *wolffi* from *pogonias*. Struhsaker (personal communication) does not agree that *wolffi* should be split from *pogonias*, citing their identical vocalizations; on the other hand, Gautier (1988) considers their high-pitched binary alarm calls to be probably convergent.

We have not followed Lernoald (1988) in separating *Cercopithecus aethiops* into four species, *aethiops*, *pygerythrus*, *sabaeus* and *tantalus*; this division was favored by Dandelot (1971) but is yet to be widely accepted. Groves (1989) argues that *C. aethiops* is so divergent from other



Russell A. Mittermeier

Cercopithecus aethiops is a wide-ranging species, typical of riverine forests throughout the savanna zone of Africa. It has invaded parts of the rain forest zone where the vegetation has been opened up by farming.



Noel Rowe

A northern talapoin monkey (*Miopithecus* sp.). The smallest Old World monkey, the talapoin's preferred habitat is low, dense growth, including tangled lianas, near rivers or in inundated forest.

Cercopithecus that it should be referred to its own genus *Chlorocebus*, but again this view has, as yet, little support. We retain *Allenopithecus*, *Miopithecus* and *Erythrocebus* as genera, rather than relegating them to subgeneric status as Lernoald did. There appears to have been no progress since the publication of the original plan in resolving the question of whether the northern and southern forms of talapoin are the same or different species.

Colobines

The taxonomy of red colobus monkeys remains very poorly resolved. In the original plan we provisionally recognized five species: *Procolobus badius*, *P. pennantii*, *P. rufomitratu*s, *P. gordonorum* and *P. kirkii*. Although there are strong grounds for regarding this arrangement as reflecting a real biological pattern, it is not a widely-accepted arrangement and can cause confusion. Until a thorough reanalysis of red colobus relationships is undertaken, ideally using new genetic information, it seems best to revert to the traditional view that there is one red colobus species (*Procolobus badius*) with many subspecies. The subspecies are discussed below.

Apes

Insufficient data are yet available to support the recent suggestion by Morin *et al.* (1994) that West African chimpanzees should be elevated to full species rank. Ruvolo *et al.* (1994) have found a greater difference in one mitochondrial gene between eastern and western gorilla subspecies than exists between common and pygmy chimpanzees for the same gene; this raises the possibility that two species of gorilla might eventually be recognized (Morell 1994).

Priority Ratings of Species for Conservation Action

Background

Since the first Action Plan was published in 1986, a number of developments have made clear the need to change not just the threat ratings of species, as a result of new information about their status, but also the rating system itself. In the original plan, species were given a priority rating for conservation action based on three parameters:

1. The estimated **Degree of Threat** to their populations, on a scale of 1 (lowest threat) to 6;
2. The **Taxonomic Uniqueness** of the species, on a scale of 1 (several close relatives) to 3; and
3. The **Association** of the species with other threatened primates, with a rating of 1 (little overlap with other threatened primates) or 2 (major overlap with one or more threatened forms).

Using this system, the lowest-rated African primate species had 3 points, and the highest (six species) had 9 points.

Since the first plan was published, the Primate Specialist Group has produced two further plans, one for Asian Primates (Eudey 1987) which used the same system as the African plan, and one for Lemurs (Mittermeier *et al.* 1992). The lemur plan used a five rather than six-point scale for Degree of Threat, basing a taxon's score on its estimated total population size (e.g., 1 = total population probably greater than 100,000, 5 = total population probably less than 100), and it used a 4-point scale for taxonomic uniqueness (from 1 = a member of a large species group, to 4 = only member of a monotypic family). The lemur plan did not use a score for association with other threatened taxa, but instead gave any taxon an extra point if it is not known to occur in any protected area. On this system, individual lemur species scored between 2 and 7 points.

In 1991, Mace & Lande proposed a new set of threatened species criteria, based on probabilities of extinction calculated from estimates of population size, geographic

range, degree of fragmentation, and rate of decline. This proposal provoked considerable debate and led to IUCN-sponsored workshops at which attempts were made to refine the proposed Red List threat categories and the criteria for their use (see Mace *et al.* 1993). The final version of this proposal was approved by the IUCN Council in 1994 (IUCN 1994).

This new categorization system has not been adopted in all its details by the Primate Specialist Group because (a) it relies heavily on numerical information about population sizes, distributions and/or rates of change that are generally not available, and (b) its strict application would result in the downgrading of some taxa to lower threat categories than are widely felt to be reasonable. On the other hand, the new system does have some merits; for instance, it focuses attention on the difficulty of categorizing extinction threats, and it draws attention to the range of factors that should be considered in allocating taxa to threat categories.

Rating System in This Plan

This plan gives African primate species a priority rating for conservation action based on:

1. The estimated **Degree of Threat** to the survival of their wild populations.
2. Their **Taxonomic Distinctiveness**.

We have eliminated a weighting based on **Association with Other Threatened Primates** in this revision. This was an ambiguous quantity, which tended to underrate the importance of taking action to protect some highly threatened species simply because they did not happen to coexist with other threatened primates.

In a draft of this plan we followed the lemur action plan and added one point to a score if a species is not known to be present in an effective protected area. Almost all African primate species occur in at least one area in which wildlife is legally protected, but in many of these areas

actual protection on the ground is weak, and completely effective protection is rare. Because members of the PSG disagreed as to what level of failure in a protection system would justify adding an extra point to a priority rating, this evaluation has not been included in the final version of this plan.

Degree of Threat

We use five categories of threat that are comparable to the new IUCN categories, but which employ less precise numerical information and larger population thresholds. The categories are: *Critically Endangered*, *Endangered*, *Vulnerable*, *At Risk* and *Low Risk*; and the criteria by which species have been assigned to these categories are as follows:

1. Low Risk

The species faces a low risk of extinction at the present time. It has a wide geographical distribution, broad ecological tolerances, and the total population is probably >100,000.

2. At Risk

Not significantly threatened at present, but the species has a limited distribution and/or ecological tolerances and is, therefore, at risk of becoming vulnerable in the next 30-40 years.

3. Vulnerable

Vulnerable to extinction within approximately the next 100 years for one or more of the following reasons: the species has a very restricted geographical distribution (<100,000 km²); surviving populations are small (total number of individuals remaining probably <100,000) and/or highly fragmented; most populations are seriously threatened by habitat destruction and/or hunting; most populations are declining and the species has a low rate of reproduction.

4. Endangered

In danger of extinction within 30-40 years because the surviving population is very small (probably <10,000 individuals remain) and is declining rapidly as a result of habitat alteration and/or hunting; or, the surviving population probably numbers <25,000 individuals and is very highly fragmented and declining rapidly.

5. Critically Endangered

In danger of extinction in the very near future as a result of extremely small population size (probably <1,000 individuals remain) and rapid decline through habitat destruction (including fragmentation) and/or hunting. No African primate species yet falls into this category.

Table 2 compares the criteria for the allocation of species to these categories with a simplified version of the criteria given for the comparable new IUCN categories. The population sizes used in our categories have been chosen to maintain some consistency among the original African primate plan, the Asian primate and lemur plans which followed it, and discussions held between members of the Primate Specialist Group and the Captive (now Conservation) Breeding Specialist Group in 1991 that led to the CBSG's Conservation Assessment and Management Plan for Primates (Stevenson *et al.* 1992). Our ratings are above all indices, indicating the relative degree of extinction threat faced by one species compared to others. Population size has not been given special weight in assigning species to different categories, because information on total population size is unavailable for the vast majority of African primate species.



John F. Oates

Monkey meat is an important source of animal protein for many people in the African rain forest, but excessive hunting may carry some species to extinction. Here a hunter holds a female white-throated guenon he has just shot in Nigeria's Okomu Forest Reserve.

Table 2
A Comparison of the Latest IUCN Threatened Species Categories with those used in this Plan

The IUCN categories are presented in simplified form; full details are given in an IUCN document (1994).

IUCN Categories	This Plan
<p>Critically Endangered Taxa facing an extremely high risk of extinction in the wild in the immediate future (equivalent to a probability of extinction of 50% within 10 years or 3 generations) as judged by any of the following:</p> <ul style="list-style-type: none"> A. A decline of at least 80% in the last 10 years or 3 generations. B. Extent of occurrence <100 km² or area of occupancy <10 km² together with severe fragmentation or decline in area. C. Population <250 mature individuals and declining rapidly. D. Population <50 mature individuals. 	<p>Critically Endangered Taxa in danger of extinction in the very near future because surviving populations are extremely small (probably <1,000 individuals remain) and rapidly declining because of habitat destruction and/or hunting.</p>
<p>Endangered Taxa facing a very high risk of extinction in the wild in the near future (equivalent to a probability of extinction of 20% within 20 years or 5 generations) as judged by any of the following:</p> <ul style="list-style-type: none"> A. A decline of at least 50% in the last 10 years or 3 generations. B. Extent of occurrence <5,000 km² or area of occupancy <500 km² together with severe fragmentation and/or decline in area. C. Population <2,500 mature individuals and declining rapidly. D. Population <250 mature individuals. 	<p>Endangered Taxa in danger of extinction in the near future because surviving populations are very small (probably <10,000 individuals remain) and declining rapidly through habitat alteration and/or hunting; or, population probably numbers <25,000 individuals, highly fragmented, and declining rapidly.</p>
<p>Vulnerable Taxa facing a high risk of extinction in the wild in the medium-term future (equivalent to a 10% probability of extinction within 100 years) as judged by any of the following:</p> <ul style="list-style-type: none"> A. A decline of at least 20% during the last 10 years or 3 generations. B. Extent of occurrence <20,000 km² or area of occupancy <2,000 km² together with severe fragmentation and/or decline in area. C. Population <10,000 mature individuals and declining. D. Population <1,000 mature individuals. 	<p>Vulnerable Taxa vulnerable to extinction in the medium term because: the total number of surviving individuals is relatively small (probably <100,000 individuals remain) and/or populations are highly fragmented; or, their geographical distribution is very restricted (<100,000 km²); or, they are seriously threatened by habitat loss and hunting; or, most populations are declining and rate of reproduction is low.</p>
<p>Lower Risk Taxa that do not qualify as Critically Endangered, Endangered, or Vulnerable. They may be <i>Conservation Dependent</i>, meaning that they are the focus of a continuing conservation program that directly affects them, and that the cessation of this program would result in the taxon qualifying for one of the threatened categories. Other subcategories are <i>Near Threatened</i> and <i>Least Concern</i>.</p>	<p>At Risk Taxa at risk because of limited distributions and/or ecological tolerances, and which are currently or potentially threatened by habitat alteration and/or hunting.</p>

Table 3
Conservation Priority Ratings for African Primate Species*

Species	Degree of Threat	Taxonomic Distinctiveness	Total
Lorisidae			
<i>Arctocebus calabarensis</i>	2	2	4
<i>Arctocebus aureus</i>	2	2	4
<i>Perodicticus potto</i>	1	2	3
<i>Otolemur crassicaudatus</i>	1	2	3
<i>Otolemur garnettii</i>	1	2	3
<i>Galago alleni</i>	2	1	3
<i>Galago matschiei</i>	2	1	3
<i>Galago senegalensis</i>	1	1	2
<i>Galago gallarum</i>	2	1	3
<i>Galago moholi</i>	1	1	2
<i>Galago zanzibaricus</i>	2	1	3
<i>Galagoides demidoff</i>	1	1	2
<i>Galagoides thomasi</i>	1	1	2
<i>Euoticus elegantulus</i>	2	2	4
<i>Euoticus pallidus</i>	2	2	4
Cercopithecidae			
<i>Macaca sylvanus</i>	3	1	4
<i>Cercocebus atys</i>	2	1	3
<i>Cercocebus torquatus</i>	2	1	3
<i>Cercocebus galeritus</i>	2	1	3
<i>Lophocebus albigena</i>	1	2	3
<i>Lophocebus aterrimus</i>	2	2	4
<i>Mandrillus sphinx</i>	2	2	4
<i>Mandrillus leucophaeus</i>	4	2	6
<i>Papio papio</i>	2	1	3
<i>Papio anubis</i>	1	1	2
<i>Papio cynocephalus</i>	1	1	2
<i>Papio hamadryas</i>	2	1	3
<i>Papio ursinus</i>	1	1	2
<i>Theropithecus gelada</i>	2	2	4
<i>Cercopithecus diana</i>	3	2	5
<i>Cercopithecus dryas</i>	2	2	4
<i>Cercopithecus neglectus</i>	1	2	3
<i>Cercopithecus hamlyni</i>	2	2	4
<i>Cercopithecus lhoesti</i>	2	1	3
<i>Cercopithecus preussi</i>	3	1	4
<i>Cercopithecus solatus</i>	3	1	4
<i>Cercopithecus albogularis</i>	1	1	2
<i>Cercopithecus mitis</i>	1	1	2
<i>Cercopithecus nictitans</i>	1	1	2
<i>Cercopithecus petaurista</i>	1	1	2
<i>Cercopithecus sclateri</i>	4	1	5
<i>Cercopithecus erythrogaster</i>	3	1	4
<i>Cercopithecus erythrotis</i>	2	1	3
<i>Cercopithecus cephus</i>	1	1	2
<i>Cercopithecus ascanius</i>	1	1	2
<i>Cercopithecus campbelli</i>	1	1	2
<i>Cercopithecus mona</i>	1	1	2
<i>Cercopithecus pogonias</i>	1	1	2

Continued on next page.

Species	Degree of Threat	Taxonomic Distinctiveness	Total
Cercopithecidae (Continued)			
<i>Cercopithecus wolffi</i>	1	1	2
<i>Cercopithecus aethiops</i>	1	2	3
<i>Miopithecus talapoin</i>	1	2	3
<i>Miopithecus</i> sp.	2	2	4
<i>Allenopithecus nigroviridis</i>	2	2	4
<i>Erythrocebus patas</i>	1	2	3
<i>Procolobus verus</i>	2	2	4
<i>Procolobus badius</i>	2	2	4
<i>Colobus polykomos</i>	2	1	3
<i>Colobus vellerosus</i>	3	1	4
<i>Colobus guereza</i>	1	1	2
<i>Colobus satanas</i>	3**	1	4
<i>Colobus angolensis</i>	1	1	2
Pongidae			
<i>Pan troglodytes</i>	3	2	5
<i>Pan paniscus</i>	3	2	5
<i>Gorilla gorilla</i>	3	2	5
* See text for details of rating system. Common names are given in Table 1.			
** The black colobus is abundant in the Lopé Reserve, Gabon, but elsewhere it is a rare animal with a fragmented distribution.			

Taxonomic Distinctiveness

The measure of **Taxonomic Distinctiveness** is reduced in this plan from a 3-point to a 2-point scale. With the elimination of one point from the **Degree of Threat** scale (compared with the original plan), an unreasonably high total priority score can result if a 3-point taxonomic scale is retained. For instance, since this plan regards the patas monkey as a member of a monotypic genus, giving 3 taxonomic points to this relatively very abundant primate (regarded as a crop pest in many places) would result in an unduly high priority rating for conservation action.

The criteria used to give a species a score of 1 or 2 for taxonomic distinctiveness are:

1. A species belonging to a genus, subgenus or species-group with 3 or more members, and/or its status as a full species is sometimes questioned.
2. A species with no more than 1 close relative (a member of the same species-group, subgenus or genus).

Results of Rating

The results of applying this rating system are presented in Table 3. The highest-ranked species for conservation action is the drill (*Mandrillus leucophaeus*), with a total score of 6. Five species have a score of 5; these are the Diana monkey (*Cercopithecus diana*), Sclater's guenon (*Cercopithecus sclateri*), the chimpanzee (*Pan troglodytes*), bonobo (*Pan paniscus*), and the gorilla (*Gorilla gorilla*).

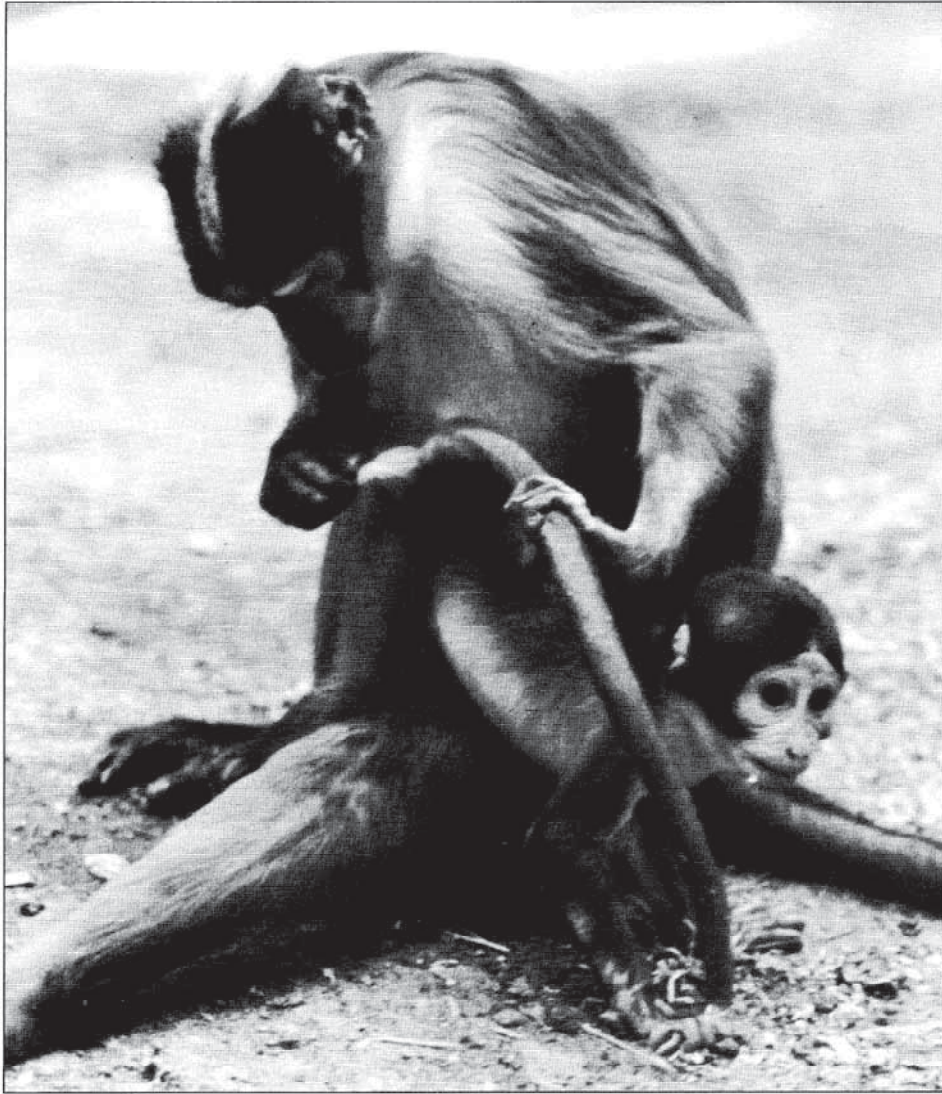
Threatened Subspecies

In the original plan, subspecies were given rather little attention. In part this was due to the uncertain taxonomic status of very many subspecies—a large number of the primate subspecies that have been named are of doubtful validity. However, certain kinds of intraspecific variability are both clear and discrete, producing distinctive local populations. Even though such populations may not have

Table 4
Subspecies and Populations of Particular Conservation Concern

Subspecies	Population	Degree of Threat	Total
<i>Cercocebus atys lunulatus</i>	2	3	5
<i>Cercocebus galeritus galeritus</i>	3	3	6
<i>Cercocebus galeritus chrysogaster</i>	1?	2?	3?
<i>Cercocebus galeritus "sanjei"</i> *	2	2	4
<i>Lophocebus aterrimus opdenboschi</i>	1?	2?	3?
<i>Mandrillus leucophaeus leucophaeus</i>	2	3	5
<i>Mandrillus leucophaeus poensis</i>	3	3	6
<i>Cercopithecus diana diana</i>	1?	2	3?
<i>Cercopithecus diana roloway</i>	2-3	3	5-6
<i>Cercopithecus hamlyni kahuziensis</i>	2	2	4
<i>Cercopithecus preussi insularis</i>	3	2	5
<i>Cercopithecus albogularis albotorquatus</i>	2	1	3
<i>Cercopithecus albogularis zammaranoi</i>	2	2	4
<i>Cercopithecus mitis kandti</i>	3	3	6
<i>Cercopithecus nictitans stampflii</i>	1-2	2	3-4
<i>Cercopithecus erythrogaster</i> (Benin)	3	3	6
<i>Cercopithecus erythrotis erythrotis</i>	2	2	4
<i>Cercopithecus ascanius atrinatus</i>	1?	1?	2?
<i>Cercopithecus pogonias pogonias</i>	2	2	4
<i>Cercopithecus aethiops djamdjamensis</i>	2	2	4
<i>Procolobus badius temminckii</i>	1	2	3
<i>Procolobus badius badius</i>	1	2	3
<i>Procolobus badius waldroni</i>	3	3	6
<i>Procolobus badius "epieni"</i> *	3	3	6
<i>Procolobus badius preussi</i>	3	3	6
<i>Procolobus badius pennantii</i>	3	3	6
<i>Procolobus badius bouvieri</i>	3?	3?	6?
<i>Procolobus badius parmentierorum</i>	1?	2?	3?
<i>Procolobus badius foai</i>	1?	1?	2?
<i>Procolobus badius semlikiensis</i>	2	2	4
<i>Procolobus badius tephrosceles</i>	2	2	4
<i>Procolobus badius rufomitratu</i>	3	3	6
<i>Procolobus badius gordonorum</i>	2	2	4
<i>Procolobus badius kirkii</i>	3	2	5
<i>Colobus angolensis prigoginei</i>	1?	1?	2
<i>Colobus angolensis ruwenzorii</i>	2	2	4
<i>Colobus guereza caudatus</i>	2	1	3
<i>Colobus guereza gallarum</i>	1	2	3
<i>Colobus guereza guereza</i>	1	2	3
<i>Gorilla gorilla</i> (Nigeria/West Cameroon)	3	3	6
<i>Gorilla gorilla graueri</i>	2	2	4
<i>Gorilla gorilla beringei</i>	3	2	5
<i>Pan troglodytes verus</i>	1	3	4

* *C. galeritus "sanjei"* and *P. badius "epieni"* have not yet been formally named.



S. Gippoliti

The white-crowned mangabey (*Cercocebus atys lunulatus*) is known only from western Ghana to the Sassandra-Nzo River system of the Ivory Coast and appears to be endangered.

been given formal species status, they must surely be recognized in conservation planning, especially when a distinct local form is under threat but the species to which it belongs is relatively secure.

In the first action plan, 15 subspecies were listed as deserving special attention on the basis of being clearly distinct from other forms, having a very limited geographical distribution and/or a small population size, and being threatened or potentially threatened. It is now clear that more than 15 subspecies should be recognized with these characteristics, and it seems worthwhile to attempt a rating of the degree to which they are threatened.

The following rating system used for subspecies and other distinct local populations is different from that used

for species (only threatened forms are considered; taxonomic uniqueness is not considered; and separate ratings are given for *population size and distribution*, and for *degree of threat*, since these are somewhat easier to estimate for localized populations): *Population size and distribution* are rated on a scale of 1-3: A score of 3 is given if approximately 1,000 or fewer individuals probably remain, or populations are limited to a total area of less than 500 km²; a score of 2 if 25,000 or fewer individuals remain, or the total area inhabited is less than 5,000 km²; and a score of 1 if less than 100,000 individuals remain, or the area inhabited is less than 10,000 km². *Degree of threat* from hunting and/or habitat loss is also rated on a 1-3 scale: 3, severe; 2, moderate; 1, low.

African Primate Communities

Like the original African primate action plan, this plan formulates conservation project priorities in part by identifying different regional primate communities and then suggesting at least one project in each community. Special attention is given to the lowland rain-forest zone, which has the highest primate species richness as well as several distinct regional communities. Other areas with special forest types and/or distinct primates are also given attention, such as the montane and coastal forests of East Africa, the mountains of Ethiopia and North Africa, and the forests and woodlands of the Casamance.

Most of the primates in the African dry forest and savanna zone have wide geographical distributions, within which are many national parks and other reserves providing reasonably good protection to primate populations. With few exceptions, the African savanna primates do not appear to be especially threatened at present (in fact they are regarded as vermin in many countries).

Many of the African rain-forest primates, on the other hand, are ecological specialists occurring at low population densities, and they live in habitats that are increasingly threatened by human activities. This plan, like its predecessor, concentrates on rain-forest primates.

Although the African rain forest (made up of moist and wet lowland forest ecosystems) occupies a smaller area than the South American or Asian rain forests, and has a lower overall tree species richness than those areas, it supports a very diverse mammal community, including about 50 primate species. As in other parts of the tropics, the rain-forest zone is under intense pressure as a result of high rates of human population growth, and agricultural and economic development. The annual rate of human population growth in Africa for 1980-85 was estimated at 2.91%, greater than in South America (2.15%) or Asia (1.91%); disturbingly, the future growth rate is predicted to remain high (2.70% annually in 2000-2005, for instance) while rates decline further elsewhere (to 1.35% in South America and 1.39% in Asia, for the same period)

(World Resources Institute 1994). At the same time, environmental conditions, inefficient techniques and a lack of capital resources are causing rates of food production in Africa to lag behind those in other tropical areas. The resulting food shortages have led to an increase in subsistence farming in many forest areas. Rates of logging are also increasing, with many new companies operating (some from parts of the world not traditionally involved in tropical Africa) and logging spreading to ever more remote areas with devastating effects for primates not only from habitat disturbance but also from hunting and other factors (Wilkie *et al.* 1992).

In most parts of the African rain-forest zone primates are heavily hunted. Even where pressures on forest land are not yet great, primates are often hunted for food and some populations are probably being driven to extinction while their habitat is more-or-less intact. Thus, if the diversity of the African primate fauna is to be maintained, major conservation efforts must be made in the rain-forest zone. Since flourishing primate populations are usually good indicators of the general health of a rain-forest ecosystem, successful efforts to conserve these primates will usually involve conservation of the system as a whole. In relatively undisturbed African forests where there is low hunting pressure, it is not uncommon to find 6-10 sympatric monkey species, together with 1-2 apes and 2-6 prosimians. Such species assemblages are typical of the forests along the Guinea Coast of West Africa between Sierra Leone and Nigeria, of the Cameroon and Western Equatorial regions stretching from eastern Nigeria to the Oubangui River, and of the forests of the Congo Basin¹ and eastern Zaire.

¹ Congo River and Basin are used here instead of Zaire River/Basin as geographical rather than political terms. A significant portion of the river borders the Republic of Congo, which has not renamed this major continental feature.



Map 2. The eleven distinct regional communities of African primates in this plan. Except for desert areas, much of the remainder of the continent carries savanna vegetation with a relatively uniform community of primates that is not currently under great threat. With the exception of the Casamance and Maghreb, regions are mapped here on the basis of vegetation distributions shown by White (1983).

At least six distinct primate communities can be recognized within this broad lowland rain-forest zone, each containing several endemic species. These communities (some of which have subregions with different subspecies) may have differentiated during dry phases of the Pleistocene, when the African rain forest is believed to have retracted and fragmented. The size and location of resultant refuges is a matter of debate (see e.g., Hamilton 1988; Colyn *et al.* 1991). Each community is here considered separately, starting in the west. A subsequent section deals with five further primate communities which occur outside the main zone. All eleven communities are shown on Map 2.

The Lowland Rainforest Zone

Upper Guinea

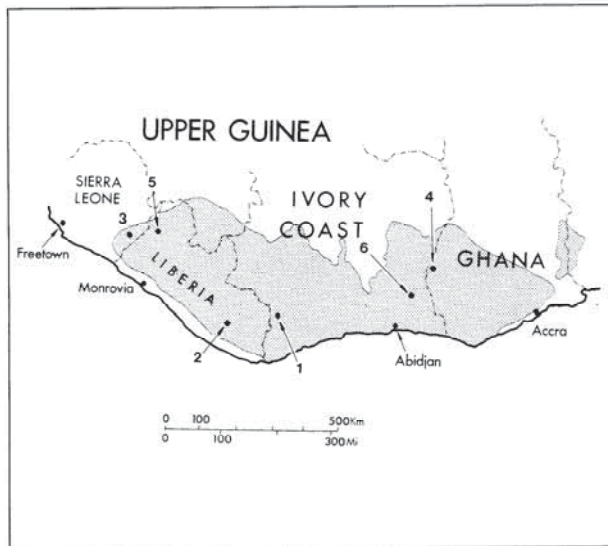
This westernmost community extends from Sierra Leone to the Dahomey Gap, an area of dry forest and woodland extending from east of the Volta River in Ghana to the western edge of Nigeria (see Map 3). The Upper Guinea forests support 5 primate species that occur only here or in drier forest further to the west: *Cercocebus atys*, *Cercopithecus diana*, *Cercopithecus petaurista*, *Cercopithecus campbelli* and *Colobus polykomos*. *Procolobus*

verus and *Colobus vellerosus* only occur in these forests and in those of the southern Nigeria region.

Colobus polykomos and *C. vellerosus* meet in the area between the Bandama and Sassandra Rivers in south-central Ivory Coast, where a hybrid population has been reported. The subspecies of most of the other monkeys change in southwestern Ivory Coast between the Cavally and Sassandra Rivers. The Upper Guinea region can therefore be considered as consisting of two major subregions in terms of its primates: West and East.

Upper Guinea West has the higher rainfall and exhibits the most faunal and floral diversity and endemism; it has been proposed that a major Pleistocene forest refuge was located in this subregion, which includes the extreme south of the Republic of Guinea as well as southern Sierra Leone, all of Liberia and the extreme southwest of Ivory Coast. Primates endemic to this western area (or to this area and the Fouta Djallon region) are *Colobus polykomos*, *Cercocebus atys atys*, *Cercopithecus diana diana*, *C. nictitans stampflii*, *C. petaurista buettikoferi*, *C. campbelli campbelli* and the *Procolobus badius badius*. Other endemic mammals are Jentink's duiker (*Cephalophus jentinki*), the banded duiker (*Cephalophus zebra*), and Kuhn's mongoose (*Liberiictis kuhni*). Hunting of primates for food by people has traditionally been intense in this region, particularly in Liberia, and many of the remaining forests are threatened by commercial logging.

The Upper Guinea East subregion is smaller and has a denser human population than Upper Guinea West. Many of the major towns of Ghana and the Ivory Coast are located in or close to this subregion. This area has several endemic primate subspecies: *Cercocebus atys lunulatus*,



Map 3. The Upper Guinea rain forest region (shaded) showing the location of projects listed in Chapter 4.



Scott McGraw

Adult female olive colobus (*Procolobus verus*) in the Tai Forest, Ivory Coast. Note the pronounced sexual swelling.

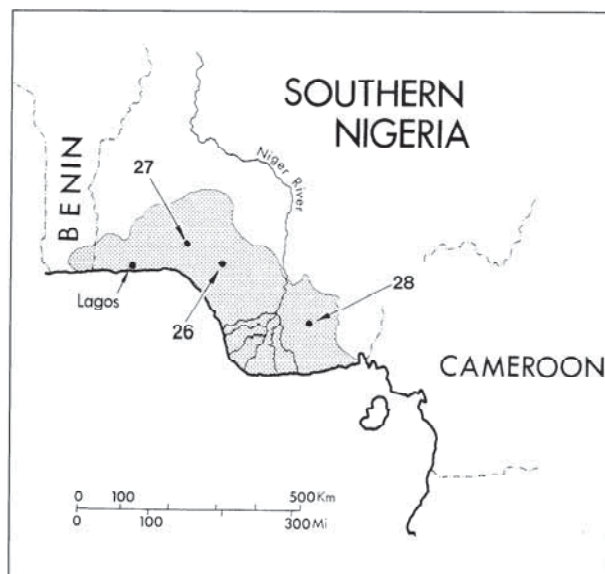
Cercopithecus diana rolaway, *Cercopithecus petaurista petaurista*, *Cercopithecus campbelli lowei* and *Procolobus badius waldroni*.

Further information on the Upper Guinea area and its primates can be found in Booth (1958), Davies (1987), Dosso *et al.* (1981), Dunn (1991), Galat & Galat-Luong (1985), Gartlan (1982), Kuhn (1965), Martin (1991), Oates *et al.* (1990), Robinson (1971, 1983) and Verschuren (1982).

Southern Nigeria

The region from southern Benin east to the Cross River (Map 4) is faunally complex. Here, some elements of the Upper Guinea region that have bridged the Dahomey Gap meet members of the Cameroon region to the east. There are also several local endemics not found to the east or west, including two primate species, *Cercopithecus erythrogaster* and *C. sclateri*. *C. erythrogaster* occurs in southwest Nigeria and southern Benin, an area in which

forests are under intense pressure from agriculture and logging, and where hunting pressure is also very severe. *Cercocebus torquatus* occurs in the same forests, which also still harbor precarious populations of chimpanzees and elephants. *C. sclateri* (once considered to be a subspecies of *C. erythrotis*) occurs only in southeastern Nigeria up to the Cross River, an area with a very high human population density where very little of the original forest cover remains. *Cercocebus torquatus* also occurs between the Niger and Cross Rivers, as do *Arctocebus calabarensis*, *Galago alleni*, *Euoticus pallidus* and *Procolobus verus*. The faunas of southeast and southwest Nigeria meet in the Niger Delta, where a distinct form of red colobus monkey was recently discovered. The form of *Cercopithecus nictitans* in southern Nigeria is probably a different subspecies from that found east of the Cross River. *Cercopithecus mona* occurs throughout this southern Nigerian region and also extends into Cameroon. For more information on south Nigerian primates see Oates (1982, 1985) and Oates *et al.* (1992).



Map 4. The southern Nigerian rain forest region (shaded) showing the location of projects listed in Chapter 4.



Destruction of lowland rain forest to make way for a pulpwood plantation, southern Nigeria.

John F. Oates

Cameroon

This region is centered on Mt. Cameroon and extends from eastern Nigeria to the Sanaga River (Map 5). It includes the 2,000 km² island of Bioko (formerly called Fernando Po). Bioko is part of Equatorial Guinea. The 30 km wide channel between the island and the Cameroon mainland is only 60 m deep, and the island must have been linked to the mainland during the last glaciation; this makes it of considerable biogeographic interest. The Cameroon region shares many species with the Western Equatorial region south of the Sanaga River, but has a high level of faunal and floral diversity and high levels of endemism (especially at high elevation, where many species are related to forms on East African mountains). Primate species endemic to the Cameroon region are *Mandrillus leucophaeus*, *Cercopithecus preussi*, and *Cercopithecus erythrotis*. Species found only in the Cameroon and S. Nigerian regions are *Arctocebus calabarensis*, *Euticus pallidus* and *Cercopithecus mona*. Most of the Bioko primates are regarded as endemic subspecies, including Pennant's red colobus (*Procolobus badius pennantii*) which is very different from the Cameroonian *P. b. preussi*. Bioko also has a *Colobus satanas* population; this species occurs in the W. Equatorial region, but is absent from western Cameroon. *Cercocebus torquatus* is found in the

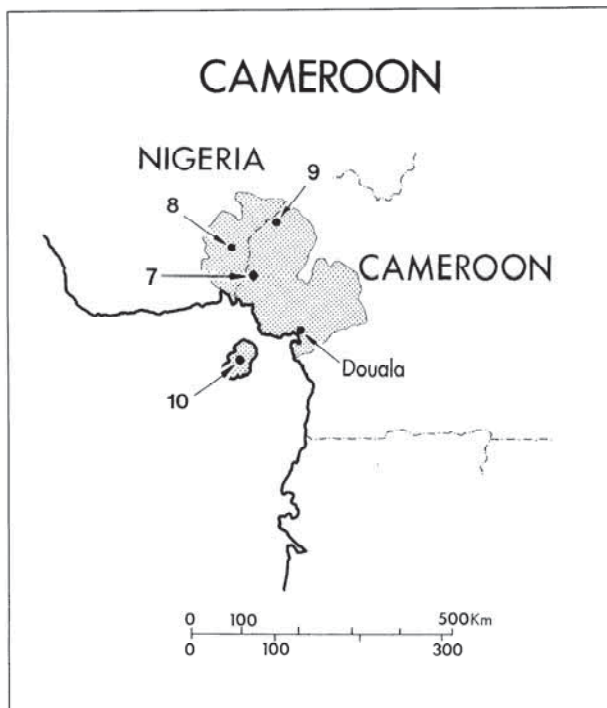
Cameroon and W. Equatorial regions and also in western Nigeria, and does not show obvious subspecific variation.

Since the first version of this plan was published there have been several investigations of Bioko's formerly poorly known primates. Among other things, these surveys have found that the forests in and around the Gran Caldera de Luba, in the very wet southwest of the island, are largely intact and support quite healthy primate populations.

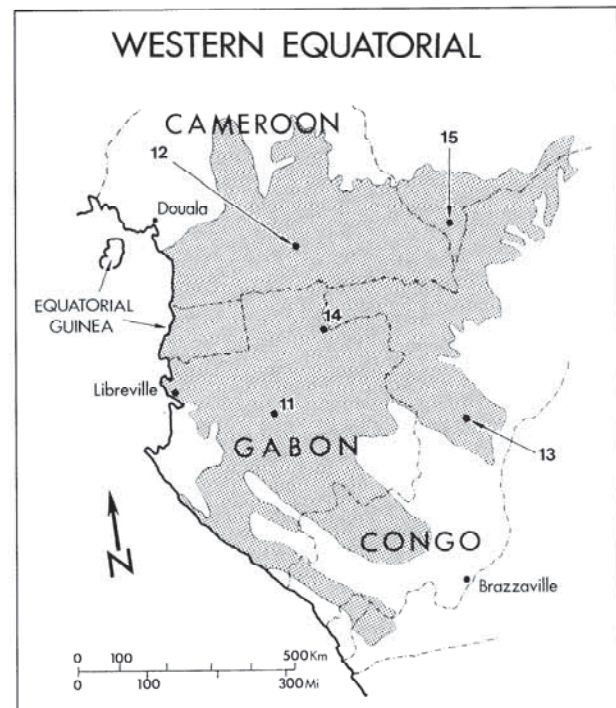
For further information on Cameroon and Bioko, see Butynski & Koster (1994), Eisentraut (1973), Fa (1992), Gadsby & Jenkins (1992) and Gartlan (1975).

Western Equatorial Africa

This region comprises the forest zone of Cameroon south of the Sanaga River, Gabon, mainland Equatorial Guinea, the Congo Republic, and the far south of the Central African Republic, together with the Angolan enclave of Cabinda and the Mayombe Forest of Zaire (north of the Congo River) (Map 6). This is an important area in global terms for primate conservation, containing at least 20 species of nonhuman primate. The area has a relatively low human population density and until recently supported large areas of little-disturbed forest. This region contains the largest remaining populations of *Gorilla gorilla* and,



Map 5. The Cameroon rain forest region (shaded) showing the location of projects listed in Chapter 4.



Map 6. The Western Equatorial rain forest region (shaded) showing the location of projects listed in Chapter 4.



Noel Rowe

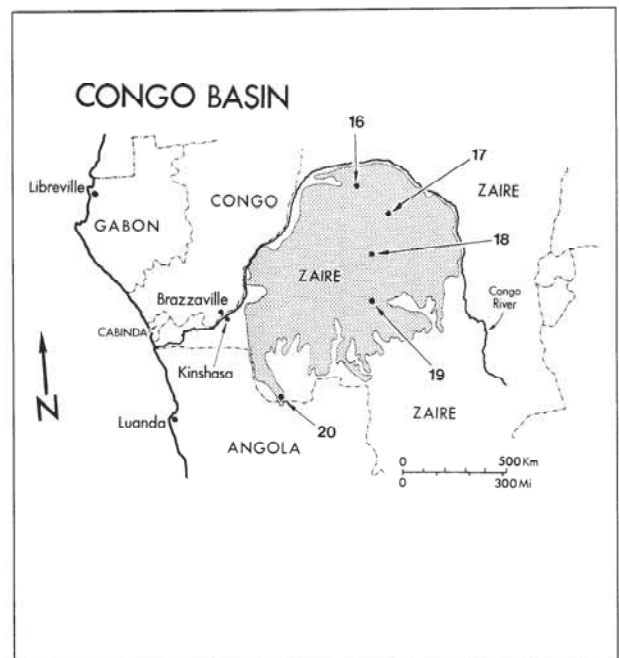
A male mandrill (*Mandrillus sphinx*). The mandrill is a forest-living relative of the savanna baboons. Like the closely-related drill of the Cameroon region to the north, the mandrill of western Equatorial Africa is heavily hunted for its meat throughout much of its range.

probably, *Pan troglodytes*. Endemic primate species are *Arctocebus aureus*, *Euoticus elegantulus*, *Mandrillus sphinx*, *Cercopithecus cephus*, *C. solatus* and *Miopithecus* sp. (northern form). Among endemic subspecies is the highly endangered bouvieri form of red colobus, and one or more forms of Allen's galago.

Further information on the primates of this region may be found in Blom *et al.* (1992), Carroll (1990), Charles-Dominique (1977), Fay & Agnagna (1992), Gartlan & Struhsaker (1972), Gautier & Gautier-Hion (1969), Gautier-Hion (1966), Lahm (1993), Mitani (1990), Sabater Pi & Jones (1967), Tutin & Fernandez (1984) and White (1992).

Congo Basin

This region covers the large forested area south of the main bend of the Congo River, including the forest network which extends south of the main forest block along the numerous tributaries of the Congo (Map 7). It has a low human population density. Most of the region is within Zaire, but it also includes the northern part of Angola. The



Map 7. The Congo Basin rain forest region (shaded) showing the location of projects listed in Chapter 4.



Scott McGraw

Inundated forest along the banks of the Lomako River, Zaire. This is prime habitat for Allen's swamp monkey (*Allenopithecus nigroviridis*) and De Brazza's monkey (*Cercopithecus neglectus*).

levels of specific endemism in the primate fauna are low, but several endemic subspecies occur here. In fact, several somewhat distinct primate faunas occur in the Congo Basin; for instance, the Kasai river separates one major fauna in the central basin, north of the river, from one to the south that extends into Angola.

The most notable primate endemics in the Central Basin are the bonobo or pygmy chimpanzee (*Pan paniscus*), and *Cercopithecus dryas*; this subregion is also home to *Cercopithecus wolffi*, the *tholloni* form of red colobus, and *Cercopithecus ascanius whitesidei*.

In the South Kasai subregion is found the southern form of talapoin monkey, as well as *Cercopithecus wolffi pyrogaster*, *C. ascanius ascanius* and *C. ascanius atrinasus*.

Two interesting forms of mangabey occur in the Congo Basin, *Lophocebus aterrimus* (sometimes considered a subspecies of *L. albigena*) and *C. galeritus chrysogaster* (sometimes considered a distinct species). The latter has a very restricted distribution in the Central Basin. The unique and poorly-known swamp monkey, *Allenopithecus nigroviridis*, lives along the Congo River and its tributaries, both north and south of the Kasai, and north into the Congo Republic.

Colyn (1991) has recently identified a third distinct faunal area on the eastern edge of this region, between the Lomami and Lualaba Rivers. The newly-described *Procolobus badius parmentierorum* is restricted to this area, along with *Cercopithecus mitis heymansi* and *C. wolffi elegans*.

For more information on this region, see Colyn (1988, 1991), Kano (1984), Kingdon (1990), Machado (1969), Schouteden (1944) and Susman & Mubalamata (1984).

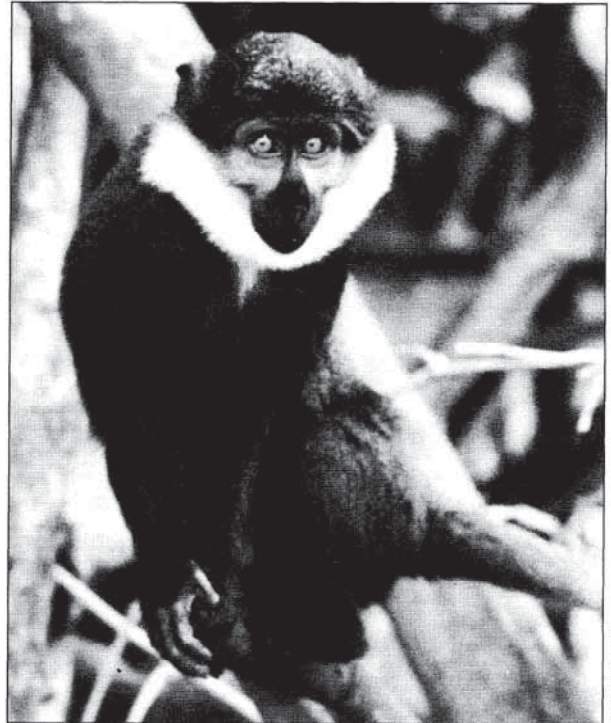
Eastern Zaire

The upper part of the Congo and its major tributary the Lualaba separate this region from the Congo Basin. It lies between the right bank of the Congo-Lualaba and the highlands of the western Rift Valley, extending from approximately the Elila River in the south to the Itimbiri River in the north (Map 8). The ranges of many elements of the fauna extend north and west of the Itimbiri around the northern edge of the Congo Basin (meeting the Western Equatorial Region in the vicinity of the Oubangui River), while others reach east across the western Rift Valley into

Uganda, Rwanda and Burundi. The region has moderate endemism and very high species richness—with 13 sympatric diurnal primates in some places (Hart *et al.* 1986). A Pleistocene forest refuge is often proposed to have been located in the area, referred to as the “Central Refuge” by Kingdon (1971) and “Ituri-Maniema” by Misonne (1963). Colyn, Gautier-Hion & Verheyen (1991), on the other hand, interpret available evidence as indicating that there were several small refuges on the margins of this area, particularly along the Congo/Lualaba in the west and along the Rift in the east; the presence of several small refuges could be one explanation for high levels of species richness.

Primate species endemic to Eastern Zaire and the Western Rift region (see below) are *Cercopithecus hamlyni* and *Cercopithecus lhoesti*. Subspecies endemic to Eastern Zaire are *Cercopithecus wolfi denti*, *Procolobus badius lulindicus*, *P. b. langi*, *Colobus angolensis cordieri* and *C. a. cottoni*. *Gorilla gorilla graueri* occurs here and on the western edge of the Rift. Some other notable endemic mammals in eastern Zaire are the okapi (*Okapia johnstoni*), the giant genet (*Genetta victoriae*), and the aquatic civet (*Osbornictis piscivora*). Eastern Zaire still contains large areas of little-disturbed forest, including extensive patches of monodominant Gilbertiodendron forest (Hart *et al.*, 1989).

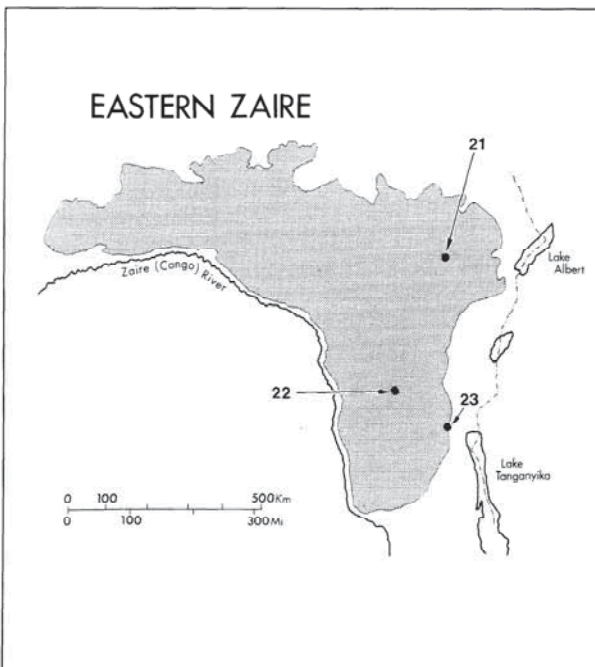
Until recently, the primates of this region had received rather little attention, but there has been recent work by



Scott McGraw

Captive l'Hoest's guenon (*Cercopithecus lhoesti*) in Kinshasa, Zaire.

Colyn (1991), Thomas (1991), Hart & Sikubwabu (1994) and Yamigawa *et al.* (1992, 1993).



Map 8. The Eastern Zaire rain forest region (shaded) showing the location of projects listed in Chapter 4.

Other Special Communities

In addition to the lowland forest regions with distinctive primate communities, several other regions of Africa have marked endemism in their primate fauna at the specific or subspecific level. These regions are, from west to east: Casamance and Fouta Djallon, the Maghreb, the Western Rift, the Ethiopian Highlands, and Coastal East Africa.

Casamance and Fouta Djallon

This small region covers southern Senegal, the Gambia, Guinea-Bissau and the western part of the Republic of Guinea (Map 9). It is the home of the least abundant form of savanna baboon (the Guinea baboon, *Papio papio*), the *temminckii* form of red colobus, and some significant populations of chimpanzees and of *Colobus polykomos*. In the past, primates have been relatively well-protected in this part of West Africa because they are not hunted for food, but the human population is large and growing rapidly, and causing extensive conversion of woodland habitats. There

were two large relatively well-protected areas in southern Senegal, the Basse Casamance National Park and the Niokolo-Koba National Park, but Basse Casamance has been closed since 1993 as a result of civil war. The Gambia has several small wildlife conservation areas. Further information is in Galat *et al.* (1992), McGrew *et al.* (1981), Moore (1985), Starin (1989) and Sugiyama & Soumah (1988).

Maghreb

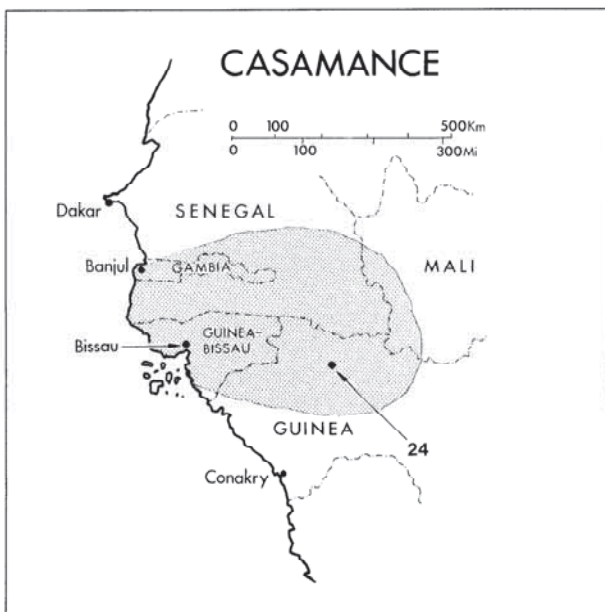
Apart from the small feral population on Gibraltar, *Macaca sylvanus* is today restricted to a few isolated areas of montane forest in Morocco and Algeria: fir forest in the Rif and Djebel Babor, and cedar and oak forests in the Moyen Atlas and Djurdjura (Map 10). These forests are under increasing human exploitation pressure (see Fa 1983 and Fa *et al.* 1984). There are no other primates in North Africa, and all other members of the genus *Macaca* live in Asia.

Western Rift

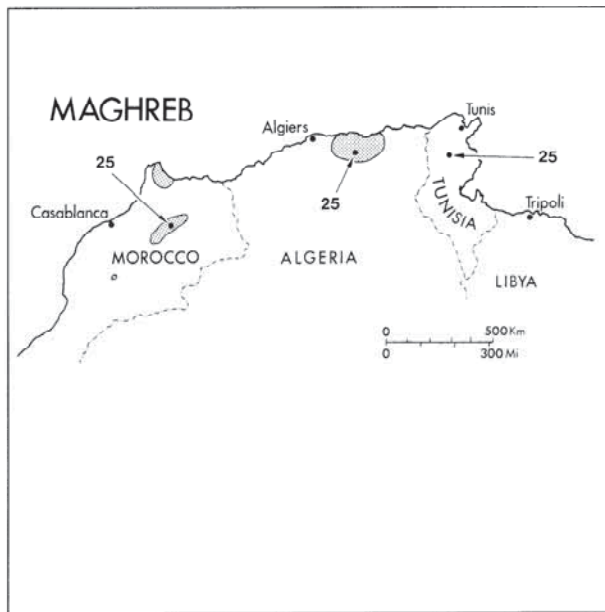
The forests at medium and high elevations along the Western (or Albertine) Rift Valley in eastern Africa (Map 11) contain several endemic and threatened primates, including the mountain gorilla (*Gorilla gorilla beringei*), the *tephrosceles* form of red colobus, some highly local-

ized forms of *Cercopithecus mitis* (*kandti*, *doggetti* and *schoutedeni*), *Colobus angolensis ruwenzorii* and *C. a. prigoginei* and *Galago matschiei*. *Cercopithecus lhoesti* and *C. hamlyni* occur in some areas, as well as in the E. Zaire region. Several forests contain important chimpanzee populations.

Among the Western Rift forests, the Kibale Forest in western Uganda, the Bwindi-Impenetrable Forest of southwestern Uganda and the Nyungwe-Kibira Forest of southwestern Rwanda and northwestern Burundi are sites of special significance for primate conservation (Struhsaker 1981; Weber 1987). They occupy altitudinal zones intermediate between the lowland forests of eastern Zaire and the montane forests of the Virunga Volcanoes. The Kibale Forest (560 km²) lies between 1,100 and 1,600 m, Bwindi-Impenetrable (330 km²) between 1,200 and 2,600 m, and the Nyungwe-Kibira Forest (1,140 km²) between 1,650 and 2,950 m. Each supports a somewhat different assemblage of primates. For instance, Kibale (see Struhsaker 1981) contains 11 species, including *Galago matschiei*, *Cercopithecus lhoesti*, chimpanzees and much of the largest remaining population of the *tephrosceles* form of red colobus, which is restricted to the medium-altitude forests along the eastern border of the lakes of the W. Rift Valley, from Kibale south to Sumbawanga in Tanzania. The Bwindi-Impenetrable Forest (see Butynski 1985) contains 10 species of primate, including *Cercopithecus lhoesti*, chimpanzees and gorillas; the exact relationship of these gorillas to other populations remains unclear.



Map 9. The Casamance woodland region (shaded). Project 24 was a survey of the Republic of Guinea.



Map 10. The Maghreb, showing the distribution of the Barbary macaque (shaded).



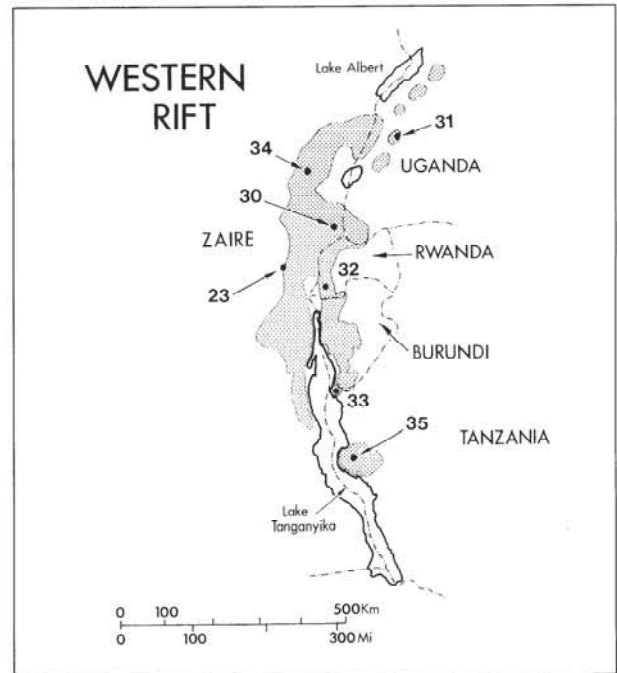
Russell A. Mittermeier

The blue monkey (*Cercopithecus mitis*) is an abundant species in many of the high altitude forests along the Western Rift Valley in East Africa.

Nyungwe is home to 12-14 primate species, including *Cercopithecus hamlyni*, *C. mitis kandti* and a large population of *Colobus angolensis ruwenzorii*, a black-and-white colobus which occurs only in the Lake Kivu area, on the Ruwenzori Mountains and in relic forests (e.g., Sango Bay) on the shore of Lake Victoria on the Uganda-Tanzania border. Another subspecies with a restricted range, *Cercopithecus mitis doggetti*, occurs in both Nyungwe and Bwindi-Impenetrable. Kibale, Nyungwe and Bwindi support a very rich diversity of plant and animal species, contain large areas of relatively undisturbed forest, and are located in areas where primates are not heavily hunted.

The Virunga Volcanoes are an important montane ecosystem on the eastern edge of the Congo Basin. They are most significant for primate conservation as the home of what may be the only population of the mountain gorilla (see Aveling & Harcourt 1984; Butynski *et al.* 1990; Harcourt & Curry-Lindahl 1979; Weber & Vedder 1983). The golden monkey, *Cercopithecus mitis kandti*, occurs only in the Virungas and in the bamboo zone of Nyungwe area.

The small Gombe National Park (32 km²), on the shores of Lake Tanganyika, has been the site of a continuous study of chimpanzee behavior since 1960 (Goodall 1986). In addition to chimpanzees, other forest primates at Gombe are the *tephrosceles* form of red colobus, *Cercop-*



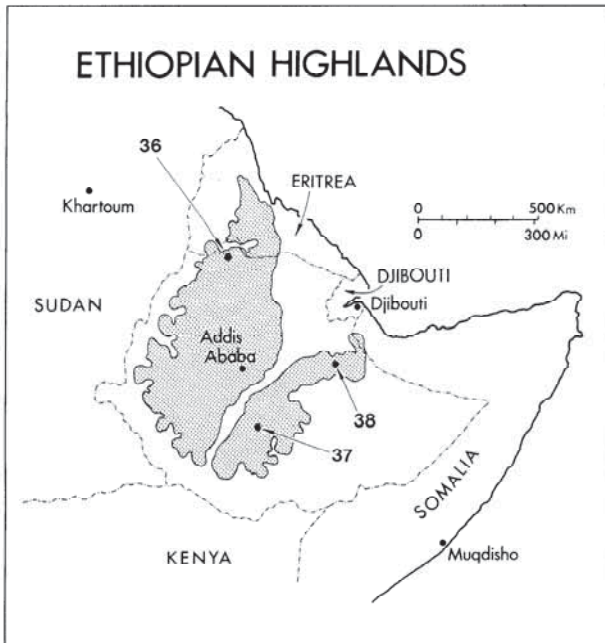
Map 11. The Western Rift forest region (shaded) showing the location of projects listed in Chapter 4.

ithecus ascanius schmidti, and *C. mitis doggetti*.

The Mahale Mountains (1,600 km²) on the eastern shore of Lake Tanganyika in Tanzania have been the site of chimpanzee research since 1965. The area contains a great diversity of ecosystems, from low-lying miombo woodland, through rain forest to alpine grassland and bamboo. In addition to a population of about 700 chimpanzees (the largest in Tanzania), Mahale supports a great diversity of other fauna and flora. Among the six monkey species in Mahale are *Cercopithecus mitis doggetti*, the *tephrosceles* form of red colobus and a form of *Colobus angolensis* that may be a new subspecies (see Nishida *et al.* 1981).

Ethiopian Highlands

The Ethiopian Highlands (Map 12) are a unique high altitude massif (much of it above 3,000 m), extensively dissected by steep-sided river gorges and bisected by the Great Rift Valley. A few primates feature among a range of endemic animals in highland Ethiopia: the gelada (*Theropithecus gelada*), an unusual forest-dwelling form of grivet monkey (*Cercopithecus aethiops djamdjamensis*), and two or more subspecies of *Colobus guereza*. *Cercopithecus neglectus* and the endemic *C. mitis houtourlini* occur in forests in the southwestern highlands. Recent research by Carpaneto & Gippoliti (1990) suggests that there may be more diversity among Ethiopian guerezas



Map 12. The Ethiopian Highlands (shaded) showing the location of projects listed in Chapter 4.

than is recognized by their common grouping into *C. g. guereza* in the southwest and *C. g. gallarum* in the northeast. They report that in the Haremma Forest in the Bale Mountains of southern Ethiopia, east of Lake Abaya, there is not only a population of *C. a. djamdjamensis*, but also a population of guerezas not readily classifiable with either the *guereza* or *gallarum* subspecies. Much of the original grassland and forest of the Ethiopian Highlands has been destroyed by cultivation and tree cutting. The recent political turmoil has probably affected protected areas.

For more information on Ethiopian primates, see Berhanu 1974; Dandelot & Prevost 1972; Dunbar 1977; Kingdon 1990; and Yalden *et al.* 1977.

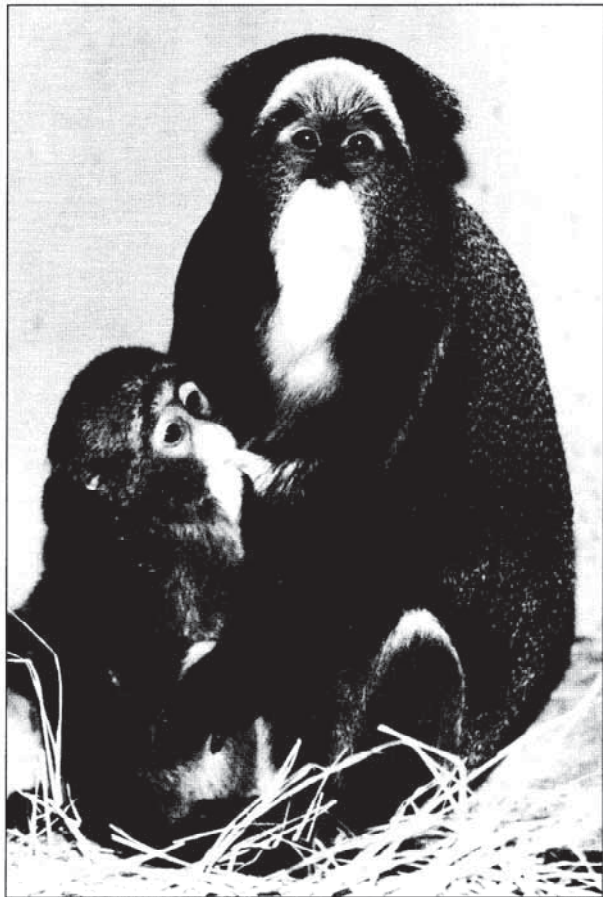
Coastal East Africa

The forests of Coastal East Africa (including the mountains of southeastern Tanzania) (Map 13) show high levels of faunal and floral endemism. This reflects their isolation from the main Guineo-Congolian forest block, an area with which they have had intermittent connections for millions of years. Faunal analysis suggests that these connections to the west have been both via the Tana River and Kenya Highlands in the north, and via the mountains of southern Tanzania in the south (Kingdon 1971). Isolated relics of a once more-widely spread primate fauna still exist in a narrow strip of forest along the coast of Kenya and Tanzania and on the island of Zanzibar, in the forests

along the lower Tana River, and in the Tanzanian mountains. All these areas are small and under pressure; for instance, along the Kenyan coast much of the forest has been very heavily disturbed by agriculture, logging, and the development of tourist resorts. Even the areas enclosed within forest reserves are disturbed, and threatened by encroachment and conversion to plantations.

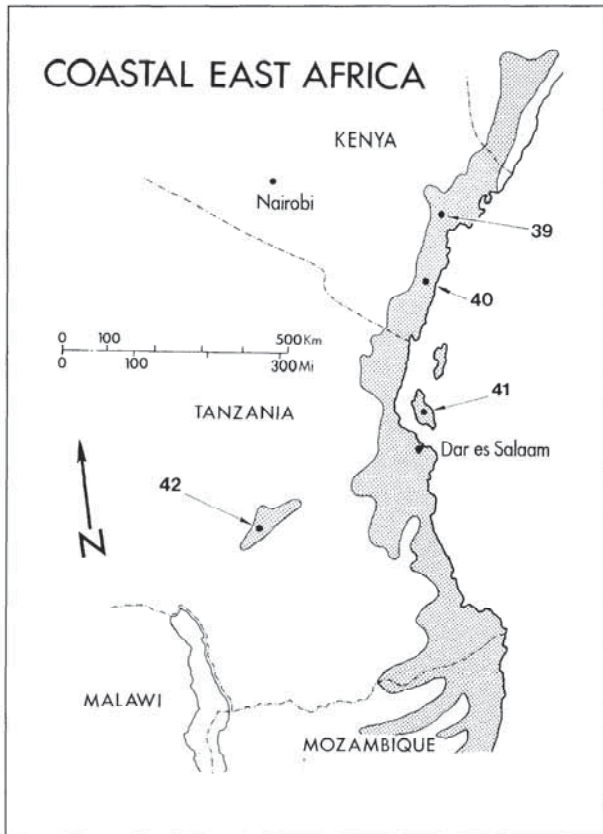
Found throughout this region are subspecies of *Cercopithecus albogularis*. Found in some, but not all, forests in the region are: *Colobus angolensis palliatus*, *Procolobus badius* (three subspecies), *Cercocebus galericus* (two subspecies), various forms of *Galago zanzibariensis*, and one or other of the greater galagos (*Otolemur crassicaudatus* and *O. garnettii*). Recent research by Bearder *et al.* (1995) suggests the presence of several endemic dwarf galagos in southern Tanzania and northern Malawi.

Three especially important areas for primate conservation within this region are the lower Tana River, Zanzibar



Russell A. Mittermeier

The De Brazza's monkey (*Cercopithecus neglectus*) is widespread in riverine forests from Cameroon in the west to Ethiopia and Kenya in the east. Kenyan populations are under threat from habitat fragmentation.



Map 13. The forests of Coastal East Africa and the Udzungwa Mountains (shaded) showing the location of projects listed in Chapter 4.

and the Udzungwa Mountains. On the floodplain of Kenya's lower Tana River are many isolated forest patches, most of which support one or more of the endemic subspecies *Cercocebus galeritus galeritus*, *Procolobus badius rufomitratu*s and *Cercopithecus albogularis albotorquatus*. Despite the establishment of a National Reserve in 1976, populations of both the mangabey and the red colobus have declined, the forest has been damaged

by agricultural encroachment, and the river's flood regime—crucial to the maintenance of the forests—is being altered by dams on the upper river and irrigation schemes on the lower river (see Marsh 1978, 1985; Butynski & Mwangi 1994).

Procolobus badius kirkii (often considered a full species) is found only on the island of Zanzibar (1,650 km²) off the northern coast of Tanzania. *Otolemur garnettii*, *Galago zanzibaricus* and *Cercopithecus albogularis* also occur on Zanzibar, which shares some other rare mammals with the coastal forests, such as Aders' red duiker *Cephalophus adersi*, which is also found in the Sokoke Forest of Kenya. Although the population of *P. b. kirkii* on Zanzibar is small (recent estimates suggest about 1,500 individuals), it appears to be stable. However, the forest habitat of *kirkii* is being disturbed and encroached, and occasionally individuals are shot (see Silkiluwasha 1981).

The Udzungwa Mountains form an isolated group in south-central Tanzania between the Uluguru Mountains to the north, and the southern highlands bordering Lake Malawi to the south. For a relatively small area, the Udzungwas support a very high diversity of plant and animal species, with many endemics. Here live the majority of remaining populations of *Procolobus badius gordonorum* (probably numbering less than 5,000 individuals) and an endemic form of crested mangabey (*Cercocebus galeritus "sanjei"*), as well as *Colobus angolensis palliatus* (see Homewood & Rodgers 1981; Rodgers & Homewood 1982).

Finally, the floodplain forest along the Jubba and Shabeelle Rivers in southern Somalia is notable for being the most northerly outlier of the East African coastal moist forest. Virtually all the forest that once occurred along the Shabeelle has been destroyed, while only about 400 ha remained along the Jubba in 1986 (Madgwick 1989; Varty 1988). The *zammaranoi* form of *Cercopithecus albogularis* is endemic to these riverine forests, where *Otolemur garnettii* and *Galago gallarum* also occur.

Review of Projects Recommended in Original Plan

Here we review what has and has not been accomplished in the projects listed in the original plan, together with recommendations for future action on each project. A standard format is used:

- **Recommended action** provides an abbreviated version of what was recommended in the first plan;
- **What has been done, Problems encountered and Recommendations for the future** summarize information and advice gleaned from published and unpublished reports, correspondence, personal experience and/or responses given by PSG members to a circulated draft of this review;
- **Organizations involved** (listed alphabetically) are those known to have provided some significant funding, on-ground management and/or research *at some point* (they are not necessarily involved at the present time).

It was originally planned that a list of key project implementors would be provided; this category has been dropped because it led to much disagreement about who should and should not be listed.

Acronyms and Abbreviations of Listed Organizations

ACCP—Alliance Congolaise pour la Conservation des Primates
BRD: Berggorilla and Regenwald Direkthilfe (Germany)
CECI—Centre Canadien d'Etudes et de Coopération Internationale
CI—Conservation International (USA)
CIRMF—Centre International de Recherches Medicales de Franceville (Gabon)
CRSN—Centre de Recherche en Sciences Naturelles (Zaire)
CSSL—Conservation Society of Sierra Leone
DAAD—German Academic Exchange Service

DFG—German Science Foundation
DPNS—Direction des Parcs nationaux du Sénégal
DPZ—German Primate Center
EAWS—East African Wildlife Society (Kenya)
EU—European Union (formerly the European Community or EC)
EU/ECOFAC—EU sponsored project for the study of biodiversity, conservation and development in Central African forests
EWCO—Ethiopian Wildlife Conservation Organisation
FDAL—Forestry Development Authority of Liberia, Division of National Parks and Wildlife
GEF—Global Environmental Facility (World Bank)
GTZ—The German technical cooperation agency
FFI—Fauna and Flora International (UK)
FINNIDA—Finnish International Development Agency
FZS—Frankfurt Zoological Society (Germany)
HC/CUNY—Hunter College of CUNY, New York (USA)
IGCP—International Gorilla Conservation Project
INECN—Institut National pour l'Environnement et la Conservation de la Nature (Burundi)
IPPL—International Primate Protection League (USA)
ITFC—Institute of Tropical Forest Conservation (Uganda)
IUCN—World Conservation Union
IZCN—Institut Zairois pour la Conservation de la Nature
JGI—Jane Goodall Institute (USA)
JIC—Japan International Cooperation Agency
KIFCON—Kenya Indigenous Forest Conservation Project
KIPR—Kenya Institute of Primate Research
KWS—Kenya Wildlife Service
MBG—Missouri Botanical Garden
NMK—National Museums of Kenya
NCF—Nigerian Conservation Foundation
NGS—National Geographic Society (USA)
NSF—National Science Foundation (USA)
NYZS—see WCS
ODA—Overseas Development Administration (UK)
ORSTOM—L'institut français de recherche scientifique pour le développement en coopération
PTES—People's Trust for Endangered Species (UK)

RSPB—Royal Society for the Protection of Birds (UK)
 TANAPA—Tanzania National Parks
 UM—University of Miami, Florida (USA)
 Unesco—United Nations Educational, Scientific and Cultural Organization
 UNP—Ugandan National Parks
 USAID—United States Agency for International Development
 USFWS—United States Fish and Wildlife Service
 USPC—United States Peace Corps
 WB—World Bank
 WCS—Wildlife Conservation Society (formerly WCI, A division of the New York Zoological Society)
 WWF—World Wildlife Fund (in the USA)/World Wide Fund for Nature (outside the USA)

Project Review

Upper Guinea

1. Conservation of Tai National Park

Country: Ivory Coast

Recommended action: Improve protection of this largest (3,400 km²) and most developed protected area in the



Termite nest in the buttress of a large canopy tree in the Tai Forest, Ivory Forest.



Old treefall area in the Tai Forest, Ivory Coast.

Upper Guinea region, including hiring a trained warden to organize patrols and enforce regulations.

What has been done: Research programs on chimps, colobus monkeys, guenons, and other mammals continue. Park boundaries are being demarcated, guards are being trained and an education program developed. Some development activities (tree nursery, fish breeding) have started.

Organizations involved: Direction Générale des Eaux et Forêts; GTZ; KfW; Tropenbos Foundation; Unesco; Wageningen Agricultural University; WWF.

Problems encountered: There is controversy over a 840 km² "protection zone" around the park, which is officially regarded as an extension of the park, but which others consider a buffer zone for controlled use. There has been cultivation in the protection zone, especially by immigrants (Riezebos *et al.* 1994). The human population around the park has increased sevenfold since 1975 and the numbers have recently been increased by refugees from Liberia. Park protection is still weak, and poaching and illegal logging within the forest are increasing.

Recommendations for the future: Tackle the buffer zone problem and work with people around park to increase their participation in conservation efforts. Strengthen forest protection efforts and monitor primate populations.

2. Development of Sapo National Park

Country: Liberia

Recommended action: Employ, train and equip staff to lay out boundaries and patrol routes; establish research station.

What has been done: The park (1308 km²—Collar & Stuart 1988) was established in 1986. Primate surveys were conducted in 1988-89 and *P. badius badius* and *Cercopithecus diana diana* were found to be common.

Organizations involved: FDAL; Philadelphia Zoo; Society for the Renewal of Nature Conservation in Liberia; USPC; WWF.

Problems encountered: Prior to 1990, logging roads on the boundary of the park were promoting illegal hunting inside. Since civil war broke out in Liberia in 1990, park management has been suspended and much of Liberia outside the capital has descended into a state of anarchy. Reports from refugees from the Sapo region suggest that hunting has decreased (because many people have left rural areas and people carrying guns are at risk).

Recommendations for the future: As soon as the political situation allows, a full assessment of the fate of Sapo



Scott McGraw

Adult female Diana monkey (*Cercopithecus diana*) feeds on a *Sacoglottis* fruit in the Taï Forest, Ivory Coast. The Diana monkey is a highly arboreal guenon restricted to the high forests of the Upper Guinea region, where it is threatened by habitat destruction and hunting.

should be carried out, including an evaluation of the state of Liberian governmental and non-governmental conservation organizations. Only then can detailed recommendations be made for future activities, but almost certainly a major rehabilitation of Sapo will be required.

3. Conservation of the Gola Forest

Country: Sierra Leone

Recommended action: Implement management plans currently being proposed; develop a research station on Tiwai Island on the western edge of the Gola Forest.

What has been done: A management study of the Gola Forest Reserves (total area 748 km²) was done in 1984-85 (Davies 1987), but the recommendations have not yet been implemented. RSPB was recently involved in an effort to develop Davies' studies further, and began a conservation education program around Gola North. A research station was developed at Tiwai and served as a base for long-term studies of *Cercopithecus diana* and three colobus species; tourism and education programs were also developed.

Organizations involved: CSSL; HC/CUNY; ODA; RSPB; Sierra Leone Forestry Division; UM; University of Sierra Leone; WCS.

Problems encountered: Research and conservation efforts have been disrupted by rebel incursions from Liberia, commencing in 1991. A German team was to do a forest inventory of Gola using remote sensing, but this has been indefinitely postponed. The Tiwai field station has been damaged by rebels. There has probably been hunting of primates both at Tiwai and in the Golas.

Recommendations for the future: When security is restored to the area, a full evaluation of the impact of the insurgency must be made. If still feasible, conservation-oriented management of the string of islands connecting Tiwai with Gola West should be developed. A field station near Gola North is needed to focus attention on the Gola region and act as a nucleus from which surveys, research and patrols can be coordinated.

4. West Ghana Parks

Country: Ghana

Recommended action: Encourage consolidation of the adjacent Ankasa Game Production Reserve and Nini-Suhien National Park into one park, as well as the protec-



John F. Oates

Immigrant farmers on the edge of the Ankasa Resource Reserve / Nini Suhien National Park in western Ghana. This reserve complex has suffered heavily from poaching.

tion and consolidation of Bia National Park and Bia Game Production Reserve.

What has been done: A student group studied birds in Nini-Suhien and Ankasa in 1988-89. Oates, Struhsaker and Whitesides made short visits to Ankasa and Bia in 1993 and 1995. IUCN has conducted a review of forest research management in Ghana. A project to improve protection has been funded by the EU.

Organizations involved: CI; EU; Ghana Dept. of Wildlife; IUCN.

Problems encountered: The surveys conducted so far have found that poaching has been rampant in both Ankasa and Bia for many years. No direct evidence of red colobus or mangabeys were found at either site in 1993 or 1995, but Roloway monkeys were detected in Ankasa and Nini-Suhien.

Recommendations for the future: Greatly improved protection of Ankasa/Nini-Suhien is urgently needed, as well as additional surveys to clarify the status of *Cercocebus atys lunulatus* and *Procolobus badius waldroni*.

5. Survey of Lofa-Mano

Country: Liberia

Recommended action: Assess wildlife populations and management needs toward establishing it as a national park.

What has been done: The proposed Lofa Mano National Park described by Verschuren (1982) includes part of the Gola National Forest, where some surveys were conducted by Poelker, Coleman and Dunn in 1989-90. Primate densities were found to be low as a result of heavy hunting pressure and no red colobus were detected, but Diana monkeys and chimpanzees were still present.

Organizations involved: FDAL; WWF.

Problems encountered: Not only was hunting a serious problem in 1989-90, but this area has almost certainly been affected by the unrest on the Liberia-Sierra Leone border that began March 1991.

Recommendations for the future: Undertake more extensive surveys when the political situation allows. Pay

particular attention to relationships of this area to Sierra Leone's Gola Forest. Clarify status of Lofa-Mano National Park proposal.

6. Survey of eastern and central Ivory Coast

Country: Ivory Coast

Recommended action: Survey to identify a site or sites for primate conservation; *Cercopithecus diana roloway* and *Cercocebus atys lunulatus* occur here and need better protection. Study faunal transition zone near Sassandra River.

What has been done: There has been a survey of chimpanzee populations across the whole of southern Ivory Coast, which found chimpanzees least common in the far east (Hoppe-Dominik 1991). This survey recommended better conservation of the Sangon-Tamin-Mabi-Yaya protected forests in eastern Ivory Coast.

Organizations involved: DPZ; Ministère de Recherche Scientifique, Ivory Coast.

Problems encountered: There appears to have been a general lack of interest in this area. The chimpanzee survey revealed widespread forest loss.

Recommendations for the future: Complete original recommendation as soon as possible, especially searching for viable populations of *Cercocebus atys lunulatus*, *Cercopithecus diana roloway* and *Procolobus badius waldroni*; pay particular attention to the Sangon-Tamin-Mabi-Yaya forests.

Cameroon

7. Development of Korup National Park

Country: Cameroon

Recommended action: Improve conservation of park (1,260 km²) by resettling resident villagers; construct park headquarters, trails and tourist facilities. Among important primates are *Mandrillus leucophaeus* and *Procolobus badius preussi* form of red colobus.

What has been done: Little progress in resettlement has been made. A park headquarters has been constructed. Educational activities are underway by environmental education officers, and there are demonstration projects

involving farming practices and alternatives to hunting. A research program was initiated and a field station established in the northern part of the forest. Primate studies have included surveys of diurnal primates by Edwards and Usongo and of nocturnal primates by Bearder and Honess.

Organizations involved: Department of Wildlife and Protected Areas, and Ministry of Environment and Forests, Cameroon; EU; GTZ; ODA; USAID; WCS; WWF.

Problems encountered: People still reside in the park, and hunters are still active. A former intensive research area has been abandoned; when research was in progress, workers venturing outside this area received threats from people using the forest.

Recommendations for the future: Resettlement of people residing in the park is a high priority, as is enforcement of hunting laws. Alternatives to hunting should be explored in an effort to curtail hunting in the park. More research is needed on the distribution and ecology of primate species, especially the red colobus and drill. There should be more liaison with the Oban Hills project in Nigeria.

8. Oban Hills Survey

Country: Nigeria

Recommended action: Survey Oban Forest Reserves, potentially important for *Mandrillus leucophaeus* and the *preussi* form of red colobus; take action on National Park proposal.

What has been done: Preliminary primate surveys have been done, and *Procolobus badius preussi*, *Mandrillus leucophaeus* and *Cercopithecus pogonias* have been found, as well as *C. erythrotis* and *Cercocebus torquatus*. Cross River National Park was created by Presidential decree in 1991, including most of the Oban group of Forest Reserves as the Oban Division of the park (2,800 km²). A management plan has been drawn up and the first phase of implementation of this plan began in 1994. Part of the plan involves a "support zone" project which focuses on providing compensation for loss of access to the park, improving traditional farming systems, educating people in the principles of sustained-yield forest management, and involving communities in the development of the park. A similar plan has been developed for the northern, Okwangwo, division of the park, covered in the next section.

Organizations involved: Cross River State Government; EU; KfW; Nigerian National Parks Service; NCF; ODA; WWF.

Problems encountered: Hunting appears to continue at a high level. Resettlement problems similar to those at Korup are unresolved, although only one village is involved. There is a proposal to excise from the originally-proposed area of the Oban Division a portion of forest in the east, adjacent to Cameroon; if this portion is excised, there will no longer be any forested connection between the eastern and central parts of Oban, or between the center of Oban and Korup.

Recommendations for the future: Protection should be increased as a matter of urgency. More research on primate distribution, population biology and ecology is needed, with a special emphasis on *P. b. preussi* and *M. leucophaeus*. Local universities should be involved. Cooperation is needed between Oban and the neighboring Korup National Park.

9. Mamfe-Obudu Survey and Mount Cameroon

Country: Cameroon; Nigeria

Recommended action: Survey of the area between Mamfe and Obudu, significant for *Gorilla gorilla* and

Cercopithecus preussi; also survey primate populations on Mt. Cameroon.

What has been done: Surveys have been conducted in the adjacent Takamanda (Cameroon) and Boshi-Okwangwo (Nigeria) forests, and Boshi-Okwangwo has had a management study (Thomas 1988; Harcourt *et al.* 1989; Caldecott *et al.* 1990). Preuss's guenon, drills and gorillas were confirmed present at both sites. A Gorilla Conservation Project has begun in the Mbe Mountains (Nigeria), adjacent to Boshi-Okwangwo. The Boshi-Okwangwo Forest Reserves have been gazetted as the Okwangwo Division (920 km²) of the Cross River National Park.

A survey on Mt. Cameroon has been conducted by Gadsby and Jenkins (1992), who focused on the proposed Etinde Forest Reserve, where *Cercopithecus preussi* was found to be relatively abundant. Twelve other primate species were recorded, including drills and chimpanzees.

A recent survey of forests in Bakossiland, north of Mt. Cameroon (and including Mt. Kupe) found evidence of at least 13 primate species surviving, including *C. preussi*, drills and chimpanzees; there was no direct evidence of angwantibos, grey-cheeked mangabeys or Preuss's red colobus (King 1994).



John F. Oates

A view from Nigeria's Obudu Plateau towards the Okwangwo sector of the Cross River National Park, home of the most westerly population of gorillas in Africa.

A WCS project is underway in the Banyang-Mbo Forest Reserve, where drills are relatively abundant and chimpanzees are present.

Organizations involved: Ministry of Environment and Forests, and Department of Wildlife and Protected Areas, Cameroon; Cross River State Government, Nigeria; EU; FFI; GTZ; MBG; Nigerian National Parks; NCF; ODA; WCS; WWF.

Problems encountered: Hunting is a major problem in Boshi-Okwangwo, Takamanda, Etinde and Bakossiland. There is much farming in Bakossiland. A recommended resettlement of three communities in Boshi-Okwangwo has not been attempted.

Recommendations for the future: Efforts should be made to repeat the Takamanda survey and follow up with conservation-oriented management. In Boshi-Okwangwo, hunting must be brought under control; the nearby, isolated Afi River gorilla population requires further study and better protection. Official protection should be given to the proposed Etinde Forest Reserve and a hunting ban made effective; a forest corridor to the west of the reserve should be considered. Also on Mt. Cameroon, protection of the existing Bambuko Forest Reserve should be improved. More comprehensive surveys are needed in Bakossiland, especially in the Upper Mungo Valley where *Procolobus badius preussi* has been suggested to be present. Several potentially important forest areas between Mt. Cameroon and Mamfe (e.g., Nkwende Hills, Ejagham and Nta Ali) deserve investigation. The Banyang-Mbo project should continue and a drill study should be initiated there.

10. Bioko

Country: Equatorial Guinea

Recommended action: Survey forests, concentrating on Pico Basilé and the San Carlos Caldera (= Gran Caldera de Luba); make recommendations for primate conservation.

What has been done: Surveys were done in 1986, 1990 and 1992 (see e.g., Butynski & Koster 1994; Colell *et al.* 1994). *Cercopithecus preussi* was found on the two main peaks of Bioko and in the Gran Caldera. Nine other primates were also found, including *Mandrillus leucophaeus*, *Procolobus badius pennantii* and *Colobus satanas*. Large parts of Bioko were found to be still covered with forest. Two protected areas, Pico Basilé and the Gran Caldera de Luba have now been decreed. A meeting was convened among scientists in June 1993 to coordinate conservation

efforts and make recommendations to the government (Fa & Juste 1994).

Organizations involved: Chicago Zoological Society; Generalitat de Catalunya; IUCN; Ministerio de Agricultura, Ganaderia, Pesca y Forestal, Equatorial Guinea; Universitat de Barcelona; WWF; Zoo Atlanta.

Problems encountered: The human population is increasing and with it, hunting pressure. The situation of *Mandrillus leucophaeus* is precarious as they are hunted with dogs. There are potential logging threats to southern Bioko. The country's legal framework for conservation is in its infancy, and the important southern half of the island particularly lacks people trained or qualified in conservation.

Recommendations for the future: Effective reserves need to be established in southwestern Bioko and on Pico Basilé, and a major research program should be initiated, including biological inventories. Natural resource legislation and especially hunting laws need to be put into place and conservation education and sustainable use programs established.

Western Equatorial Africa

11. Development of Lopé Reserve, Gabon

Country: Gabon

Recommended action: Upgrade to National Park; revoke timbering permits. Support primate research. Study feasibility of extending reserve east across Offoué River into Forêt des Abeilles, home of *Cercopithecus solatus*.

What has been done: Research on gorillas and chimpanzees has been conducted by Tutin and Fernandez, Rogers and Williamson, and White. There have also been surveys of other primates. An ECOFAC project commenced in 1992, directed by M. Fernandez, which includes biological research and the establishment of a second research camp, as well as some rural development and ecotourism aspects. A management plan for the reserve (of 5,000 km²) includes a proposal for a core area of 2,200 km² that will not be logged in the future. Gautier-Hion and others have begun a study of *Cercopithecus solatus* and other primates in the Forêt des Abeilles. In 1994, *C. solatus* was observed in the center of Lopé (White & Mackanga-Missandzou 1995).

Organizations involved: CIRMF; ELF Gabon; EU/



Russell A. Mittermeier

The red-capped mangabey (*Cercocebus torquatus*) is a largely terrestrial rain forest species found from southern Nigeria to the western equatorial region that is a favorite target for hunters.

ECOFAC; Ministère des Eaux et Forêts, Gabon; WCS; WWF.

Problems encountered: Logging permits have been allocated that cover the entire reserve and the threat of logging has greatly increased in recent years due to completion of a railway. A national park status is not viable for the whole reserve because of its value for logging, but the proposed core area will have the same status as a park. Some loggers, knowing they will lose permits, are trying to quickly get as much as possible out of the core area.

Recommendations for the future: Legal confirmation and physical delimitation of the completely protected core area is an immediate priority, as is the maintenance of poaching at its current low level. Primate research should continue.

12. Dja Survey

Country: Cameroon

Recommended action: Survey and develop this proposed national park.

What has been done: The 5,760 km² reserve has been designated as a World Heritage Site and Biosphere Reserve. It is also included in the EU's ECOFAC project, which conducted primate surveys in 1995. A park headquarters has been constructed. A study of hunting practices and their impact on mammal populations within the reserve is also underway. Forest guards have been trained and are doing surveillance, and the project is concentrating on developing both participative management of the reserve, and alternative sources of revenue to hunting.

Organizations involved: EU/ECOFAC; Cameroon Ministry of Environment and Forests.

Problems encountered: The Trans-African Highway threatens the Dja Reserve, which has been heavily affected by hunting, especially in its western part; both chimpanzees and gorillas are subject to hunting, along with the monkey fauna.

Recommendations for the future: Continue implementation of original recommendation, and investigate more closely the presence or absence of black colobus and mandrills in the reserve. Long-term ecological research is needed.

13. Survey of the Republic of Congo

Country: Republic of Congo

Recommended action: Conduct a country-wide survey paying particular attention to the *bouvieri* form of red colobus, *Allenopithecus nigroviridis* and *Gorilla gorilla*, as well as the Odzala National Park.

What has been done: Wildlife surveys have been conducted in the north (with important pioneering work on primates by Kano and Kuroda), and in the Garabinzam, Lefini, and Lac Telle areas. At the end of 1993 a new National Park, Nouabale-Ndoki, was established in the north (4,000 km² adjacent to CAR's Dzanga-Ndoki park); research on gorillas and chimpanzees has begun here. Surveys in northern Congo (e.g., Fay & Agnagna 1992) suggest that the country may have the largest population of gorillas in Africa. A gorilla orphanage project started in Brazzaville in 1990 has lowered the trade in apes throughout Congo; this project is establishing a natural sanctuary in the Lefini Reserve, one of the few listed localities for Bouvier's red colobus. Odzala National Park with the contiguous Lekoli-Pendaka Reserve and the Mboko Hunting Area (comprising a total of 2,830 km²) are included in the EU's ECOFAC project. A survey of all primates within the Odzala complex is under way. Ecological studies of gorillas and chimpanzees are also being conducted in the neighboring Ndoumbi-Lossi area (Bermejo 1994), together with a conservation education program.

Organizations involved: ACCP; EU/ECOFAC; GEF; GTZ; Howletts Port Lympne Foundation; Japanese government; USAID; WCS.

Problems encountered: Nouabale-Ndoki is almost entirely surrounded by logging concessions, without management for long term sustainability and with many roads. The Odzala protected area complex is subject to hunting particularly in the south and southwest. Political disorder in Congo in 1993, that could have threatened conservation work, has subsided for the moment.

Recommendations for the future: Existing projects should continue. A survey of the status of the *bouvieri* form of red colobus is still urgently needed; this should include a thorough survey of the Likouala swamps. More surveys near the Gabon border are needed.

14. Northeastern and Southwestern Gabon

Country: Gabon

Recommended action: Develop a reserve near the Congo-Cameroon border; establish best location and dimensions of a reserve. Also, more surveys needed in southwest Gabon.

A. Northeastern Gabon

What has been done: Zoological and botanical surveys have been conducted by Lahm, Wilks and others, which indicate that Minkébé is the best choice for a reserve in northeast Gabon. This area contains three primates found nowhere else in Gabon (*Cercopithecus neglectus*, *Cercocebus galeritus* and *Colobus guereza*) and may be one of the last sites where *Colobus satanas* and *C. guereza* co-occur.

Organizations involved: Institut de Recherche en Ecologie Tropicale, Gabon; Ministère des Eaux et Forêts, Gabon; WCS.

Problems encountered: Reduced support from WWF has left Minkébé relatively neglected. Minkébé is also burdened by a rush of gold panners and a recent forest development project may stimulate logging. The already established Ipassa-Makokou Biosphere Reserve (which has an ecological laboratory) is heavily used by hunters and trappers, and few large mammals are left, but a preliminary survey of the proposed Mingouli Reserve, south of Ipassa, has found a large area of undisturbed forest of high potential value for primate conservation.

Recommendations for the future: A reevaluation of Minkébé is needed to look at the effects of the recent human impact and its consequences for the establishment of an effective protected area. The Ipassa-Makokou Reserve should be extended to the south and its management improved.

B. Southwestern Gabon

What has been done: The Gamba Complex (including the Moukalaba and Petit Loango reserves and several "domaines de chasse") are receiving special attention, with the goal of implementing an integrated conservation and development program, and creating an "area of rational exploitation of the fauna"; reserve headquarters have been constructed at Petit Loango.

Organizations involved: GTZ; Ministère des Eaux et Forêts, Gabon; WWF.

Problems encountered: There has been a general lack of resources. Oil exploration is taking place in the area, and there is logging pressure.

Recommendations for the future: A more detailed survey is needed, and an environmental impact plan must be put in place to minimize damage from oil drilling.

15. Central African Republic

Country: Central African Republic

Recommended action: Assist development of lowland gorilla reserve in the far south.

What has been done: The Dzanga-Sangha Dense Forest Special Reserve and the Dzanga-Ndoki National Park have been established in the Sangha-Baere Prefecture, contiguous with Congo's Nouabale-Ndoki park. The protected area is currently being expanded by 600 km² which will connect the southern border of the Dzanga sector to the northern border of the Ndoki sector. The conservation project is encouraging a diversification of research on other primates in the reserve. Long-term studies of gorillas and other mammals have been carried out since 1986 by Carroll, Fay, Remis and Goldsmith.

Organizations involved: GTZ; NGS; USAID; WB; WCS; WWF.

Problems encountered: Recently, logging permission has been renewed by the CAR government and logging has resumed in the Bayanga Region of the reserve.

Recommendations for the future: A new effort is needed to protect the Bangassou Forest, the northern limit of the range of *Pan troglodytes troglodytes*.

Congo Basin

16. Lomako Forest

Country: Zaire

Recommended action: Development of a reserve, especially to protect *Pan paniscus*.

What has been done: A proposal was prepared for the establishment of a Strict Nature Reserve covering 3,800 km² between the Lomako and Yekokora Rivers; this was submitted to IZCN in 1990 (Thompson-Handler *et al.* 1995). A survey by G. Hohmann and B. Fruth has confirmed the presence of bonobos at Bohua, north of the original bonobo study site at Ndele. Behavioral research on bonobos is continuing at both sites.



Scott McGraw

Undisturbed mature forest on the banks of the Lomako River, Zaire.

Organizations involved: Antwerp Zoo; CRSN; DAAD; DFG; IZCN; Max Planck Society; Munich University.

Problems encountered: Hunters using abandoned logging roads have been moving into the forest (especially to the east of Ndele), and farming has also been spreading. Diamond miners are starting to explore rivers in the area. The 1990 reserve proposal has not yet to be acted upon; political instability in Zaire has made central government ineffective, and many outside agencies are withholding support until such time as greater political and economic stability return.

Recommendations for the future: Press ahead with efforts to establish a protected area as soon as conditions allow; evaluate the present status of all primates in the area.

17. Survey of Wamba Area

Country: Zaire

Recommended action: Investigate status of *Cercopithecus salongo* (= *C. dryas*) and establish the best place for a *Pan paniscus* reserve.

What has been done: Kano and colleagues have established a provisional reserve for *P. paniscus* in the Wamba study area that has been recognized by the local government. Taxonomic study of *C. salongo* specimens from Wamba have shown their relationship to *C. dryas* (Colyn, Gautier-Hion & van den Audenaerde 1991).

Organizations involved: Kyoto University; Bonobo Protection and Conservation Fund (Georgia State University)

Problems encountered: There is a high human density in the area, with associated high levels of hunting and habitat loss; this will make establishment of a national park difficult. Researchers were forced to abandon the site for two years because of political instability. On their return in 1994 they found that some bonobos had been killed and eaten by people who had moved into the area from neighboring villages and who had no taboo against harming the animals.

Recommendations for the future: Reestablish research and conservation efforts, including conservation education.

18. Survey of Salonga National Park

Country: Zaire

Recommended action: Assess fauna and conservation needs. *P. paniscus* may be present.

What has been done: Research in Salonga National Park (36,000 km²) has been conducted by Gautier-Hion and others (see e.g., Gautier-Hion & Maisels 1994). Significant numbers of *Pan paniscus* were confirmed present in the northeastern sector of the park, and high densities of several other primates were found there, including *P. badius tholloni*, *Colobus angolensis*, *Lophocebus aterrimus*, and *Allenopithecus nigroviridis*. *Cercopithecus dryas* seems to occur near the park, but not within it. An ECOFAC project was to develop a field research station, but this plan has been delayed.

Organizations involved: EU/ECOFAC; FFPS; Ministère de l'Environnement, France; PTES; Royal Society/CNRS.

Problems encountered: Before the general problems facing Zaire caused research and conservation efforts to be suspended in 1991, hunting pressure on primates was low,



Thomas F. Kulesa

An Allen's swamp monkey (*Allenopithecus nigroviridis*) being offered for sale in Zaire. This species inhabits swamps and gallery forests in both Zaire and the Congo Republic.



Noel Badrian

The bonobo (*Pan paniscus*) occurs only in the forests south of the Congo River. This species is slightly smaller than its close relative, the common chimpanzee, and is an accomplished user of the high forest canopy. Logging concessions threaten its forest habitat.

at least in the northeast. Organized poaching of elephants was occurring, however. In the south, forest was being felled very close to the park and here hunting may be a greater problem. Protection of such a large park is a daunting task for an agency like IZCN which has few resources.

Recommendations for the future: Research and conservation efforts should be revived as soon as conditions allow, after an assessment of the impact of events since 1991. The headwaters between the Tshuapa and the Lomela Rivers should be surveyed, as should the area between Lopori and Lomami rivers. Better guard salaries and equipment should be provided.

19. Lukenie-Sankuru

Country: Zaire

Recommended action: Survey the area to assess status of *Cercocebus galeritus chrysogaster*; make recommendations for its conservation.

What has been done: J. Thompson has made surveys south of the Lukenie River, focused on *Pan paniscus*, but

also paying attention to other primates. A bonobo study site has been established at Yasa, but *C. g. chrysogaster* has not been confirmed as present here.

Organizations involved: CRSN; Oxford University.

Problems encountered: Hunting pressure on monkeys and other large mammals is very heavy at Yasa. Local traditions protect bonobos, but these are ignored by recent migrants.

Recommendations for the future: This area still remains poorly known. Further surveys are required, to better establish the status of *C. g. chrysogaster*.

20. Northeastern Angola

Country: Angola

Recommended action: Survey this area and the adjacent area of southwest Zaire to assess the status of *Lophocebus aterimus opdenboschi*, *Cercopithecus ascanius atrinasus*, *C. neglectus*, *Miopithecus talapoin* and *Colobus angolensis angolensis* and make recommendations for their conservation.

What has been done: no actions known.

Organizations involved: none known.

Problems encountered: The political situation in Angola and Zaire has mitigated against this project.

Recommendations for the future: Conduct survey as soon as conditions allow.

Eastern Zaire

21. Ituri Forest Survey

Country: Zaire

Recommended action: Assess distribution and status of primates and make conservation recommendations (especially for *Cercopithecus hamlyni* and *C. lhoesti*). Compare primate populations in different forest types. Initiate primate field research program.

What has been done: The Okapi Faunal Reserve (13,000 km²) was gazetted in May 1992; it covers 20% of the Ituri Forest. Some primate censuses were made in 1986; 13

species of anthropoid primates were found, including *Cercopithecus hamlyni* and *C. lhoesti*. Ecological research on sympatric *Colobus angolensis* and *C. guereza* was conducted by Bocian in 1992-94, together with primate censuses in different forest types.

Organizations involved: IZCN; NSF; USAID; WCS; WWF.

Problems encountered: There has been resistance to the reserve by some local communities.

Recommendations for the future: A thorough study of *Cercopithecus hamlyni*, including its distribution and status, is still needed, and a chimpanzee census would contribute to the continent-wide picture. Conservation planning must take account of the increasing number of people living in and around the park and address the problem of immigration.

22. Maiko Survey

Country: Zaire

Recommended action: Survey Maiko National Park and N. Walikali /W. Lutunguru areas to the south of Ituri, espe-



John F. Oates

Lenda research camp in the Ituri Forest, Zaire. The Ituri has the most species-rich monkey fauna in the world. *Cercopithecus hamlyni* occurs in the *Gilbertiodendron* forest at Lenda.

cially for eastern lowland gorillas (*Gorilla gorilla graueri*). Develop management recommendations.

What has been done: Surveys of large mammals in Maiko have been conducted by Hart and Sikubwabo (1994). A new WCS project began in 1994 and will focus on *G. g. graueri* and other large mammals.

Organizations involved: BRD; IZCN; WCS.

Problems encountered: The Kisangani-Bukavu Road which passes close to Maiko National Park has been partially rehabilitated. It will facilitate exploitation of the southern sections of the forest. A community of rebels in Maiko presents a security threat.

Recommendations for the future: Development management recommendations and provide support to IZCN to improve protection of the park.

23. Kahuzi-Biega Conservation

Country: Zaire

Recommended action: Improve protection of this national park, important for eastern lowland gorillas, *G. g. graueri*. Restructure tourist program to lessen disturbance to gorillas.

What has been done: Guard forces are being trained, equipped and compensated. An integrated conservation and development project emphasizes increasing public awareness and visitation to the park. Four groups of gorillas are habituated for tourism in the eastern part of the park. Gorillas were censused in the original 600 km² montane sector in 1989 (Yamigawa *et al.* 1992, 1993). A census of primates in the park was conducted by Hall and others in the low-lying park extension in 1994; gorilla densities were found to be higher than expected (around 5,000 animals) and *Cercopithecus hamlyni* was found to be relatively common, but hunting pressure was also found to be intense.

Organizations involved: BRD; GTZ; IZCN; WCS.

Problems encountered: A new highway (the Kisangani-Bukavu Road) is planned to pass through Kahuzi-Biega, but the plan has been suspended, at least for the time being. Human population density is high near the park boundaries, and the vulnerable corridor between the original montane sector and its eastern extension has been damaged by tree-cutting, cattle encroachment and hunting.

Recommendations for the future: There is an urgent need to define agreed park boundaries (they are currently disputed). A conservation project should be established in the park extension. Protection must be improved. There should be regular monitoring of primate populations.

Casamance and Fouta Djallon

24. Survey of the Republic of Guinea

Country: Guinea (also Guinea-Bissau, Senegal and The Gambia)

Recommended action: Survey primate populations and develop reserves to protect *Papio papio*, the *temminckii* form of red colobus, and *Pan troglodytes verus*.

What has been done: A questionnaire survey of the distribution and population of chimpanzees in Guinea by Sugiyama & Soumah (1988) suggests a probable population decline. Chimpanzees and Diana monkeys were reported heard but not seen in a survey of the 50 km² Kounounkan Massif in southwest Guinea in 1992; no evidence of red colobus was obtained (Barnett *et al.* 1994).

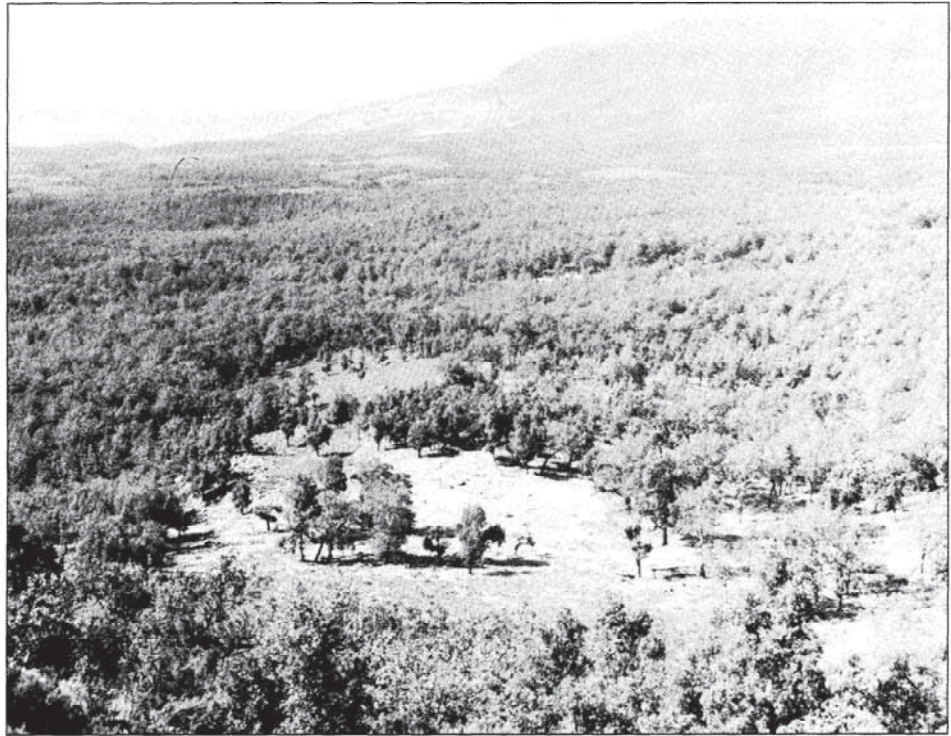
There has been a chimpanzee survey by Gippoliti and Dell'Omo (1994) in neighboring Guinea-Bissau, which is part of the Casamance-Fouta Djallon area of concern highlighted in the original plan; the Cacine Basin (particularly the Cantanhez Forest) was identified as an important site for conservation of both chimpanzees and *Procolobus badius temminckii*.

In Niokolo Koba National Park in southeastern Senegal, adjacent to Guinea, Galat *et al.* (1992) estimated a population of 140,000-240,000 *Papio papio* but found only two groups of *P. b. temminckii*.

Organizations involved: Direction des Eaux et Forêts, Guinea; DPNS; CECI; IUCN; ORSTOM.

Problems encountered: In Guinea, Guinea-Bissau and southern Senegal, remaining closed-canopy forest is apparently being rapidly reduced. In Guinea, chimpanzee populations close to the Liberian and Sierra Leone borders appear to have been affected by poaching. The Basse Casamance National Park has been devastated by civil war and has been closed since 1993 (Burnham 1993).

Recommendations for the future: Conduct more detailed investigations into the status of primates in Guinea and Guinea-Bissau, and work to establish one or more national or similar protected areas parks (including, per-



John E. Fa

Mixed oak-forest habitat of the Barbary macaque in north Morocco.

haps, one in the Cazine Basin) to conserve representative areas of natural forest; evaluate the possibility of a trans-frontier protected area between Guinea and Guinea-Bissau. In Guinea, assess the importance to primates of the recently-gazetted Bodior National Park. In Senegal, survey the Forêt de Fathala (76 km²) in the Delta du Saloum National Park; this forest protects the most northerly population of of *P. b. temminckii*.

Maghreb

25. Barbary Macaque Conservation

Country: Morocco, Algeria

Recommended action: Study human impacts on remaining *Macaca sylvanus* populations; support establishment of a national parks system in Morocco and reinforce existing Algerian system; study the possibility of translocating animals to Tunisia.

What has been done: Macaque genetics, behavior and population dynamics have been studied by Gautier-Hion and Ménard in Algeria, where macaques and their habitat are protected in the Djurdjura, Gouraya, Taza and Chréa

National Parks. Surveys by Fa and Mehlman in 1990-92 in Morocco found conflict between cedar forest managers and macaques, which are viewed as pests because of their bark-stripping. The reintroduction of *Macaca sylvanus* to Tunisia has been explored by Gilbert de Turkheim.

Organizations involved: Agence Nationale pour la Conservation de la Nature, Algeria; Dep. des Eaux et Forêts, Morocco; Ministère Français de l'Environnement; La Montagne des Singes; Universities of Göttingen, Minnesota, Rennes and Zurich; Université de Tizi-Ouzou, Algeria; Yemassee Primate Center.

Problems encountered: In Algeria, forest fires, logging and livestock grazing in macaque habitats are a problem, and some young animals are captured for sale as pets. Insurgency has interrupted studies in Algeria and outside support has been suspended since September 1993. In Morocco, macaque habitats are under threat from illegal logging and overgrazing by large numbers of sheep and goats; the problem is exacerbated by drought. Moroccan forestry authorities have considered culling macaques because of their bark stripping.

Recommendations for the future: In Morocco, macaque protection must be integrated into national biodiversity conservation plans; further population surveys are needed, and

the bark-stripping problem thoroughly investigated. The Algerian work should be resumed as soon as the political situation allows, and a study of human impact on macaque populations is still needed; national park protection must be made more effective. A concerted strategy for the captive and wild macaque populations must be developed.

Southern Nigeria

26. Management of Okomu Forest

Country: Nigeria

Recommended action: Assist establishment of a wildlife sanctuary. Conduct a management study.

What has been done: The Okomu Wildlife Sanctuary was gazetted within the Okomu Forest Reserve in 1985, and extended in 1990. NCF has been running the Okomu Forest Project and has constructed a permanent station; the project has emphasized protection of the sanctuary but is also involved in the development of a conservation program. A socioeconomic survey of people in the reserve has been conducted. A census of primate populations has shown a healthy population of *Cercopithecus erythrogaster* and confirmed the probable presence of chimpanzees.



Noel Rowe

The Nigerian white-throated guenon, *Cercopithecus erythrogaster*, photographed at Okomu, Nigeria. This species has one of the most restricted distributions of all African primates, and its remaining populations are under intense pressure.

Organizations involved: Edo State Government; Ford Foundation; NCF; ODA; PTES; WCS.

Problems encountered: The reserve around the wildlife sanctuary is being degraded by conversion to oil-palm and rubber plantations, and to farmland. Current plans for agricultural-development assistance to immigrant farmers already resident in the reserve seriously threaten the integrity of the reserve and endanger the Wildlife Sanctuary. Federal and state governments have not demonstrated a strong commitment to the protection of Okomu and it has been neglected by the international conservation community.

Recommendations for the future: More effective conservation in the Forest Reserve outside the Wildlife Sanctuary needs to be developed urgently. Management should emphasize sustainable forestry rather than farming. Establishment of a management committee with community, state and NGO participation would probably be helpful. Trust fund mechanisms to support Okomu should be investigated and a program of scientific research established.

27. Ondo and Ogun Survey

Country: Nigeria

Recommended action: Survey the two states to investigate the status of *C. erythrogaster* and other primates; prepare management recommendations.

What has been done: Surveys of Ondo State Forest Reserves have been carried out by Afolayan and Agbelusi. They have identified Ala, Idanre and Ifon Reserve as potentially important sites for chimpanzees (see Agbelusi 1994).

Omo Forest Reserve in Ogun State has been the site of research and conservation activities by the private Nigerian Forest Elephant conservation group. This project has established a base camp and conducted primate censuses. An originally small strictly protected area has been extended. *Cercopithecus erythrogaster* is present.

Organizations involved: Nigerian Federal University of Technology, Akure; NFE; Ogun and Ondo State Governments.

Problems encountered: Intensified logging is a problem in Omo and other forest reserves in southwest Nigeria. Like Okomu, these areas suffer from a lack of interest on the part of the international community.

Recommendations for the future: Support the development of an effective protected area for primates and other forest wildlife in Ondo; also support better protection of Omo and continuing research there.

28. Niger-Cross Survey

Country: Nigeria

Recommended action: Survey area between Niger and Cross Rivers to determine the distribution and status of *Cercopithecus sclateri*; recommend conservation measures. Consider better protection for relic populations of *Procolobus verus*.

What has been done: Surveys have located eight populations of *C. sclateri*, two of which occur entirely or in part in existing Forest Reserves, and two of which are in villages where the monkey is sacred (Oates *et al.* 1992). In one of the Forest Reserves, Stubbs Creek, the Nigerian Conservation Foundation has initiated a conservation project in collaboration with the Akwa Ibom State Government. In the village of Akpugoeze *C. sclateri* have been censused and a pilot study of behavior and ecology

has taken place; first steps towards establishing a conservation education program have been taken.

A *P. verus* population has been found to survive in the Taylor Creek area of Rivers State, where a preliminary survey has been conducted and a conservation project has been proposed.

Surveys have recently been extended to the Niger Delta, where a new subspecies of red colobus (*P. b. epieni*) has been discovered.

Organizations involved: Enugu State Government; Rivers State Government; Mobil Producing Nigeria; NCF; NGS; WCS; WWF-US.

Problems encountered: Between the Niger and the Cross, very little natural forest remains and the remnants are under intense pressure. Except in villages where they are considered sacred, monkeys are heavily hunted and even in these villages traditions are beginning to lapse, threatening the monkeys' future. The Stubbs Creek project has made little progress, and there has been little enthusiasm on the part of national or international NGO's to give major assistance to conservation in this area.

Recommendations for the future: Work for lasting pro-



Noel Rowe

Juvenile Sclater's guenon (*Cercopithecus sclateri*). This endangered monkey, related to *Cercopithecus erythrotis*, has a very restricted distribution in eastern Nigeria.



John F. Oates

Logs from *Hallea* trees felled in the habitat of the Niger delta red colobus monkey await a tow to sawmills in the Nigerian capital, Lagos.

tection of the remaining populations of *C. sclateri*, and determine the limits to its distribution in the eastern Niger Delta, where it appears to meet *C. erythrogaster*. Revive the Stubbs Creek conservation project. Support the establishment of a protected area or areas near Taylor Creek where, in addition to olive colobus, a population of the Nigerian subspecies of pygmy hippotamus (once considered extinct) may still survive. Extend conservation efforts to the central Niger Delta (see New Projects, page 58).

Western Rift

29. Bwindi Forest Conservation

Country: Uganda

Recommended action: Support more effective conservation, including the establishment of a series of nature reserves or a national park, and extension of boundaries; establish a research station.

What has been done: The Impenetrable Forest Conservation Project (IFCP) was initiated in 1986, leading to the gazettelement of the Bwindi-Impenetrable Forest National Park in 1992, and the establishment of a buffer zone. The IFCP has now become the Institute of Tropical Forest Conservation (ITFC). A management plan for the park has been completed and biological inventory, multiple-use conservation, education, tourism development, agroforestry, and family planning programs are now in place. Ugandan students are being trained, park staff and guards have been equipped, and illegal activities in the



Russell A. Mittermeier

The Bwindi Forest Reserve of southwestern Uganda (once known as the Impenetrable Forest) contains a significant population of mountain gorillas as well as a high diversity of other primates.

park have been reduced. A detailed gorilla census has been completed (about 320 animals are present) and gorilla tourism started in April 1993. To sustain the park in the long-term the Bwindi-Impenetrable Forest Conservation Trust and a tourism revenue sharing program are being established (see Butynski & Kalina 1993).

Organizations involved: BRD; CARE; Embassies of Canada, Germany and USA; FFI; GEF; IPPL; ITFC; Makerere University; UNP; USAID; WWF-International and WWF-US.

Problems encountered: High local human population density still threatens the forest. Four gorillas were killed by poachers in the park in March 1995. There is pressure from tour operators to expand the gorilla tourism program to a level that might be damaging. There are inadequate fire-control measures. Park administration here and elsewhere in Uganda can be improved.

Recommendations for the future: More data on the ecology and population biology of the gorilla population should be gathered, and the impact of tourism on the gorillas must be monitored. The scope of the tourism program should be expanded to include bird watching, nature walks and nocturnal walks, but one view is that gorilla tourism should be limited to two groups because of the potential threat to the animals and because of the management problems an expansion of this component would cause. Multiple-use and revenue sharing programs need to be refined; the buffer zone needs further development. The Trust Fund should be enhanced and a gorilla disease-risk assessment conducted.

30. Virunga Volcanoes

Countries: Rwanda, Uganda, Zaire

Recommended action: Improve protection, especially of Uganda and Zaire areas; continue support for mountain gorilla project; investigate status of the golden monkey (*Cercopithecus mitis kandti*).

What has been done: The Mountain Gorilla Project evolved into the International Gorilla Conservation Programme (IGCP) in 1990, serving Rwanda, Zaire and Uganda.

The Mgahinga Game Sanctuary (Uganda) was gazetted as the Mgahinga Gorilla National Park status in 1992. A gorilla conservation project started at Mgahinga in 1989; activities include: ecological surveys (including a gorilla census), reclamation of encroached land, and boundary demarcation; rangers have been trained and equipped and nearly all illegal activities stopped; tourism has begun (see Butynski & Kalina 1993).

The Zaire Gorilla Conservation Project has combined logistic assistance to the Parc National des Virungas with the development of tourism based on gorilla viewing. This has brought good income to the government park plus surveillance both for the large area in which the gorillas are viewed and for the smaller Tongo area where chimpanzees are viewed.

Until the invasion of Rwanda in late 1990 by rebel forces, conservation management in Rwanda's Parc National des Volcans was proceeding very smoothly, with reduced levels of poaching, high revenue from tourism, a research program at the Karisoke Research Center, and the continuation of education projects. In 1988, Volcano Veterinary Center was established to monitor the health of habituated gorilla groups and to advise on the tourism program.

A distributional survey of *C. m. kandti* in Rwanda and Zaire was conducted in 1987-88 and identified the Virungas as the major remaining habitat for the subspecies.

Organizations involved: AWF; BRD; CARE; Centre for International Migration and Development; Dian Fossey Gorilla Fund; EU; FFI; FZS; GEF; Gorman Animal Protection Society; IGCP; ITFC; IZCN; Morris Animal Foundation; Office Rwandaise du Tourisme et des Parc Nationaux; UNP; USAID; WWF-International and US.

Problems encountered: Twice since 1990, researchers and staff have been forced to leave the Karisoke Research Center because of the conflicts in Rwanda; the gorillas in the Rwandan Parc National des Volcans were apparently unharmed by the war in 1994, but the Karisoke station was damaged, illegal cattle grazing appears to have increased,



The Virunga volcanoes viewed from southwestern Uganda. Intensive cultivation around the bases and on the slopes of the volcanoes in Uganda and Rwanda has greatly restricted the habitat available to mountain gorillas and severed the link between the gorillas of Bwindi and the Virungas.

and land mines were planted in the park; as of early 1995, periodic incursions of militias into the park from Zaire were still a problem, but mines were being cleared and tourism had recommenced. In 1994, almost one million refugees from Rwanda established camps close to the southern sector of the Virunga National Park in Zaire and have been heavily exploiting it for fuelwood; armed gangs of poachers are plundering the park for duikers and monkeys. Meanwhile, political and economic instability in Zaire since 1991 have resulted in a decline in park management and tourist operations and a withdrawal of most outside financial and technical support.

Recommendations for the future: The relatively very small size of the Virunga gorilla population (around 300 animals) means that continual monitoring and close protection are required; political developments have made this difficult. A general long-term problem requiring attention is the level and nature of tourism in the Virungas; further studies are needed to assess the most appropriate strategy for each area, considering numbers of visitors and regulations of their conduct (for instance, there are reports of tourists being allowed to play with young, and infectious diseases may be spreading from humans to gorillas). There is also scope for improved conservation awareness programs, and revenue sharing programs between the parks and the local people. Further genetic and taxonomic work is required to establish the relationships of the Virunga and Bwindi gorillas.

More baseline data are needed on the distribution, size and composition of the golden monkey population.

31. Kibale Forest Conservation

Country: Uganda

Recommended action: Increase effectiveness of conservation measures, upgrade conservation status, and continue ecological and management studies.

What has been done: The forest was upgraded to a Conservation Forest within the Forest Department in 1992, and to a Forest National Park in 1994. A major field research station, the Makerere University Biological Field Station, has been established at Kanyawara. A range of ecological studies have continued, including *Pan troglodytes* socioecology, monkey frugivory, and a survey of nocturnal primates. Buffer zone management and community outreach are being developed. An ecotourism project began in 1992 and is attracting up to 500 visitors per month.

Organizations involved: EU; Makerere University; Uganda Forest Department; UNP; USAID; WCS.

Problems encountered: There is still some encroachment by farmers, especially in the southern part of the forest, though it has been greatly reduced since 1992. Settlers engage in snaring, net-hunting and tree poaching.

Recommendations for the future: Kibale is now the site of some of the longest-ever field studies of forest primates and these studies should continue, as should education,



John F. Cates

The Kibale Forest, Uganda, site of a major ecological study of rain forest primates since 1970. Its status was upgraded to Forest National Park in 1994.

agroforestry and tourism programs. The field station needs to develop long-term financial independence and should emphasize the training of Ugandan professionals.

32. Nyungwe-Kibira Conservation

Countries: Rwanda, Burundi

Recommended action: Support conservation work in these contiguous forests. Increase legal protection of Nyungwe; survey Kibira, especially for the presence of the *tephrosceles* form of red colobus, and improve its protection.

A. Nyungwe (Rwanda)

What has been done: A conservation plan for the Nyungwe Forest Reserve and its primates has been produced, reviewed, and partially implemented. Some biological inventory work has been conducted there have been studies of *Cercopithecus lhoesti*, *C. mitis doggetti*, *Lophocebus albigena* and *Colobus angolensis*. *Cercopithecus hamlyni* has been observed in the forest and *C. mitis kandti* may be present. Tourism and public awareness programs have been initiated.

Organizations involved: EU; FED; USAID; WCS; WB.

Problems encountered: The political turmoil in Rwanda disrupted management, research and tourism at Nyungwe; some outside assistance is currently suspended. Previous to this turmoil, the forest had been been disturbed by bamboo cutting and gold-mining, and demographic and development pressures remain a potential threat to the forest, especially if there is a large-scale return of refugees. There has been insufficient collaboration between Kibira and Nyungwe due to political problems and lack of means.

Recommendations for the future: Research and management efforts are now being revived. Research should include studies of the impact of proposed management. Better information on the distribution and density throughout Nyungwe of all primate species is needed. There is a need to transfer expertise to Rwandan biologists and conservationists.

B. Kibira (Burundi)

What has been done: The U.S. Peace Corps is collaborating with INECN. Chimpanzee censuses have been conducted, and a tourism plan is being developed. It appears that red colobus are not present.

Organizations involved: JGI; USAID; USPC.

Problems encountered: There is a lack of collaboration between Kibira and Nyungwe. Protection is threatened by cutting of bamboo and gold-mining, by growing political instability, and by an influx of refugees into the area from Rwanda. In 1995 it was reported that the Burundi military were bombing and burning the forest to chase out rebel forces.

Recommendations for the future: Reevaluate status of forest as soon as conditions allow. Better knowledge of the overall distribution and density of primate populations is required.

33. Gombe National Park

Country: Tanzania

Recommended action: Continue monitoring of the park and its chimpanzees.

What has been done: The very long-term study chimpanzees has continued. The northern community of chimpanzees has been habituated for tourism and some research. A study of predation on red colobus by chimpanzees, and of red colobus feeding, ecology and demography is in progress. There has been a plant species inventory and vegetation mapping.

Organizations involved: JGI; NSF; TANAPA.

Problems encountered: The human population along the shore of Lake Tanganyika has increased year by year, and there has been minor wood cutting and timber poaching in the margins of the park; occasional uncontrolled fires in the late dry season are also a problem. Tourist groups occasionally disturb chimpanzees; there is a danger of disease transmission from humans to the small chimpanzee population. The small size of the park threatens its long-term effectiveness.

Recommendations for the future: The feasibility of reducing numbers of fisherman with compensation for an alternative livelihood should be explored. The size and behavior of tourist groups should be better controlled. Further research on disease transmission among humans, chimpanzees and baboons would be useful.

34. Western Rift of Zaire

Country: Zaire

Recommended action: Survey forests from Beni to Bujumbura. Assess needs for protection.

What has been done: Gorilla surveys were conducted by Aveling on Mt. Tschiaberimu (Parc National des Virungas) in 1985 and 1987, and by Butynski in 1995; Butynski concluded that 16-18 gorillas were still present. In 1991, Hall and Wathaut made a reconnaissance of much of the historical range of *G. g. graueri* (including the Itombwe Forest), and in 1993 Sikubwabu undertook two surveys of forest patches near Fizi (south of Bujumbura).

Organizations involved: IUCN; IZCN; WCS.

Problems encountered: The area between Beni and Bukavu is densely populated. Although most of the montane ecosystems north of Bukavu have legally protected status, transitional and midaltitudinal forests are severely degraded and threatened. Mt. Tschiaberimu has been encroached by agriculture and damaged by pit-sawing and gold mining. The mountain forests of Itombwe are severely threatened on slopes adjacent to Lake Tanganyika; an IUCN/IZCN project to develop and implement a community managed protected area met initial success but has halted for lack of funds. Rwandan and Burundian refugees have taken up residence in areas adjacent to Itombwe, Kahuzi-Biega and the Virunga National Park and will pose an additional threat for many years to come.

Recommendations for the future: The Itombwe and Tschiaberimu forests and their gorilla populations deserve urgent attention. Resources should be mobilized urgently to mitigate the problems posed by the refugee influx. The possibility of better protection of montane forest remnants near Lutunguru (inhabited by red colobus) needs to be explored.

35. Mahale Mountains Park Management

Country: Tanzania

Recommended action: Assist development and management, including establishment of more effective anti-poaching patrols.

What has been done: Studies of chimpanzee behavior and ecology, and of other fauna and flora and fauna have continued. There is a thriving ecotourism operation, and a new community of chimpanzees is being habituated for viewing by tourists.

Organizations involved: Japanese Ministry of Education, Science and Culture; JICA; Kyoto University; TANAPA.



G. Teledi

The chimpanzee (*Pan troglodytes*). Africa's great apes, the chimpanzees and the gorilla, are the closest living relatives of the human species.

Problems encountered: A large fishing settlement inside the park boundary is causing serious damage to vegetation. About 10 chimpanzees died of a flu-like disease in 1993, which might have been acquired from tourists; tourists are often allowed too close to the animals and this is not sufficiently discouraged by park managers.

Recommendations for the future: Settlements inside the park should be relocated. Primate studies should be continued, and extended to other species. More anti-poaching patrols are recommended, especially in the eastern part of the park. The size and behavior of tourist groups should be better controlled and the scope of the tourism program expanded to include bird watching and mountain climbing; training of guides should be improved. Further research on human-chimpanzee disease transmission is desirable.

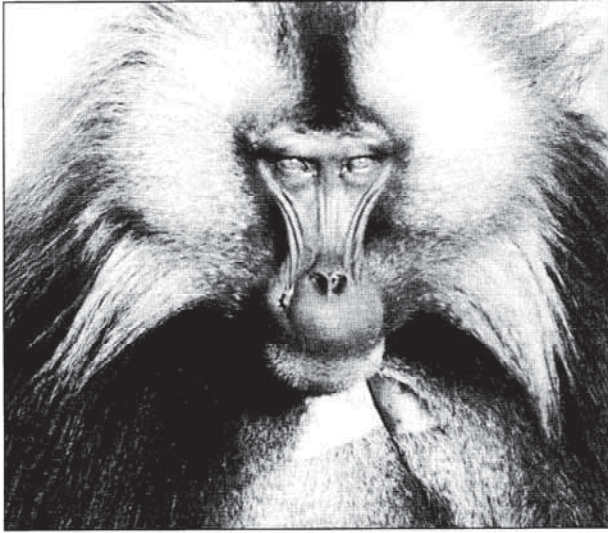
Conservation management should be extended to the Kasakati-Ugalla area which can play an important role as a buffer zone for the park.

36. Simien Mountains Conservation

Country: Ethiopia

Recommended action: Provide better protection for Simien Mountains National Park, important for *Theropithecus gelada* and *Colobus guereza guereza*.

What has been done: Studies of gelada have continued at intervals. A UNESCO emergency grant for park rehabilitation has been awarded (it is a World Heritage site).



R. I. M. Dumber

An adult male gelada (*Theropithecus gelada*). His muzzle has been wounded in a fight with another male over control of a reproductive unit.

Organizations involved: EWCO; Kyoto University; Pro-Simen Fund (Switzerland); Unesco; WWF-International.

Problems encountered: Two decades of war caused major damage to management infrastructures, and tourist visits are destroying the road leading to the park.

Recommendations for the future: There appears to be no up-to-date information on the status of *Colobus guereza* in the park; that information would be worth collecting. Research on human needs and impact in the area is recommended; the local community should be more involved in ecotourism.

Ethiopian Highlands

37. Bale Mountains

Country: Ethiopia

Recommended action: Assess feasibility of translocating gelada breeding groups to proposed Bale Mountains National Park. Work for better protection of the park.

What has been done: A management plan has been produced for the park. Gelada have been discovered in the eastern highlands of Ethiopia, in the Indeltu area. *Cercopithecus aethiops djamdjamensis* and a population of *Colobus guereza* of uncertain affinities have been found in the Harennna forest in the southern part of the Bale

National Park; anubis baboons and *Galago senegalensis* also occur in the park (Carpaneto & Gippoliti 1990).

Organizations involved: EWCO and Ethiopian Government; WCS; WWF-Italy.

Problems encountered: The Bale National Park receives an inadequate budget to implement the management plan.

Recommendations for the future: Translocation of geladas to the Bale Mountains has been judged inappropriate, not only because geladas have been found in the Indeltu area, but also because Bale has very little cliff habitat. Instead, additional gelada conservation efforts should be focused on the newly-discovered Wabe Shebelle gorge Indeltu population. At Bale, there is a continuing need to work for better protection of the park system and its surroundings, with more attention to addressing the needs of local people. Following the political turmoil of 1991, settlement occurred in some areas of the park. The Harennna forest suffered from timber poaching and uncontrolled fires. The status of *Cercopithecus aethiops djamdjamensis* and *Colobus guereza* in the Bale Mountains needs further investigation.

38. Harrar Survey

Country: Ethiopia



S. Gippoliti

Colobus guereza in the Harennna Forest, Ethiopia. The taxonomic affinities of the Harennna population are unclear.

Recommended action: Locate additional conservation areas for *Papio hamadryas* and *Colobus guereza gallarum*.

What has been done: No known action.

Organizations involved: EWCO.

Problems encountered: There is no key person or group involved in this area. Large numbers of refugees from the Somali conflict have moved into and out of the area successively over the past decades. The area is very impoverished.

Recommendations for the future: There is a need to find an interested individual or organization to work in this area, which is now becoming more peaceful. A broad conservation approach is needed, not just focusing on primates. A new regional government might be expected to be supportive from pride in its own conservation area.

39. Tana River Research

Country: Kenya

Recommended action: Establish a research station in the Tana River Primate National Reserve. Monitor population trends in red colobus (*Procolobus badius rufomitratus*) and mangabeys (*Cercocebus galeritus galeritus*); assess forest regeneration.

What has been done: Permanent camps for students, scientists and park guards have been completed. Several population surveys of the red colobus and mangabeys have been conducted as well as other basic research on primate ecology, forest ecology and human impact. Protection has been improved and community activities initiated. A GEF proposal is under consideration that covers park management, community development, and research and monitoring.

A 1994 survey (Butynski & Mwangi 1994) is the most comprehensive so far. It found that more monkeys may survive in the lower Tana forests than had been estimated previously; the new estimates are 1,100-1,300 red colobus and 1,000-1,200 crested mangabeys. A majority of the red colobus population occurs outside the National Reserve; Mnazini East and Kinyadu West forests are particularly important for red colobus and Nkanjonja for mangabeys. *Cercopithecus albogularis albotorquatus* was found to be relatively widespread and common, with an estimated 3,000 individuals in the lower Tana forests.

Organizations involved: AWF; EAWS; Emory University; GEF; KIPR; KWS; NMK; NSF; Tana River Manage-

ment Committee; WCS; WWF; Zoo Atlanta.

Problems encountered: Although some ecological research has suggested that the Tana forest is becoming senescent from natural causes, recent studies by Decker (1994b) and by Butynski & Mwangi shows that the biggest immediate threats to the habitat are forest clearing by farmers, fires, and tree-cutting for canoes and honey. High levels of banditry (there are Shiftas on the east bank of the Tana) threaten the security of residents and researchers, and have resulted in most local people living on the west bank of the river (some of them in the reserve). The west bank forests are therefore under most pressure, and arrests of people infringing reserve regulations have created strained relations with wildlife authorities. There is a plan for a new dam on the upper Tana River which would impound four years' flow and greatly affect the flood regime in the Primate National Reserve.

Recommendations for the future: The new red colobus and mangabey population estimates need to be confirmed by further surveys. The finding that 44% of mangabey groups and 63% of red colobus groups occur outside the National Reserve shows the great importance of extending conservation measures to non-reserve forests. Butynski & Mwangi (1994) suggest firebreaks, tree plantations and the introduction of different canoe management or construction practices. In the reserve itself there is a continuing need to monitor the flora and fauna, and the impact (on the primates especially) of human agricultural activities, upstream development works, and climate change. A long-term plan for red colobus and mangabey management should be developed; this might consider translocation of monkeys presently outside the reserve into unpopulated forest patches inside, and the establishment of corridors between forest patches; genetic studies would be a useful component of this plan. There is a need to resettle as many reserve residents as possible through voluntary means; community awareness, education and extension activities should be encouraged. A buffer zone policy needs to be developed, reserve infrastructure should be improved and tourism developed; there should be no reduction in the size of the reserve. The plan for a new dam on the upper Tana should be opposed.

Coastal East Africa

40. Kenya Coast Survey

Country: Kenya

Recommended action: Survey remaining coastal forest,

especially Boni and Arabuko-Sokoke; make management recommendations.

What has been done: Arabuko-Sokoke was re-surveyed in 1991; five primate species are present, including *Cercopithecus albogularis albotorquatus* and *Galago zanzibaricus*. A management plan is being drawn up and a large-scale conservation program has been approved.

Organizations involved: Kenya Forest Department; KIFCON; KWS; NMK; ODA.

Problems encountered: The more northerly forests are currently unsafe to visit because of Shifta activity. South of Mombasa, coastal forest still contains *Colobus angolensis*, but serious degradation of the forest habitat continues here.

Recommendations for the future: Implement management plan for Sokoke-Arabuko. Further habitat surveys of more northerly forests (particularly Witu, Dodori and Boni) would be useful, and could be initiated with a remote sensing study. The remaining southern forests require stringent management to conserve remaining forest areas. The status of *Colobus angolensis* needs to be assessed.



Thomas T. Struhsaker

Zanzibar red colobus (*Procolobus badius kirkii*).

41. Zanzibar Conservation

Country: Tanzania

Recommended action: Protect red colobus populations; increase area protected by Jozani Forest Reserve and upgrade it to a national park; give better protection to the Muyuni coastal forest strip and Uzi Island; monitor translocated populations.

What has been done: There has been new ecological research on the red colobus in the Jozani area, and plans have been drawn up for an island-wide survey of the monkey.

Organizations involved: CI; FINNIDA; NGS.

Problems encountered: In Jozani, habitat degradation from commercial logging, agriculture, tree-cutting for fuelwood and charcoal production have been problems; logging has now stopped, but hunting has become more common. Removal of habitat outside Jozani is greatly exceeding regeneration.



Russell A. Mittermeier

Cercopithecus albogularis albotorquatus, a subspecies of Sykes' monkey restricted to the coastal forests of northern Kenya and southern Somalia.

Recommendations for the future: There is still a need to upgrade Jozani Forest Reserve to national park status. A management plan for the reserve needs to be agreed, and this should consider the demarcation of boundaries, the establishment of a research station, and the development of an adjacent buffer zone. Tourism needs to be developed and better organized, both in the reserve and on private land outside the reserve; for instance, walkways should be built in critical areas of the reserve where tourist trampling is damaging the vegetation. Outside Jozani, a new island-wide survey of red colobus is needed, and the existing Forestry Act should be enforced.

42. Udzungwa Mountains, Tanzania

Country: Tanzania

Recommended action: Improve protection of the mountains and their endemic red colobus and mangabey populations; support plans to gazette W. Kilombero, Mwanihana and Udzungwa scarp forests as a National Park; assist better management of the non-contiguous Magombera Forest (which also contains red colobus); support continued research on the primate community.

What has been done: Approximately 3,000 km² of the Udzungwa Mountains were gazetted as a National Park in 1992. A survey of Magombera has been conducted by Decker (1994a) and produced an estimate of 544 red colobus remaining there as well as finding red colobus in other nearby forest patches.

Organizations involved: GTZ; Selous Conservation Programme; Tanzania National Parks; WCS; WWF.

Problems encountered: *Procolobus badius gordonorum* appears to prefer low elevation forest habitat, which is also the area of greatest human disturbance in Magombera and the Udzungwas. The Udzungwas are difficult to patrol and the red colobus are hunted. Since 1980 the Magombera Forest has been reduced from 11 km² to 6 km² and is threatened with clear-felling for fuelwood by a neighboring sugar plantation.

Recommendations for the future: The Magombera Forest has still not been formally gazetted into the Selous Game Reserve; this should be done immediately. Better patrolling is needed in both Magombera and the

Udzungwas. Pressure on Magombera might be reduced by the creation of woodlots on village land and a firebreak around the forest. A long-term study of *Cercocebus galeritus* "sanjei" and *P. b. gordonorum* and their habitat is needed. Further surveys are needed to better understand the distribution and status of red colobus in forests south of Magombera and to guide management plans for the Selous Game Reserve and the Kilombero Game Controlled Area.

Project Outcomes

Table 4 and Figure 1 summarize the outcomes of the 42 groups of projects recommended in the original African primate Action Plan. Some or all of the actions recommended in the plan were taken in 38 (90.5%) of projects, but in 10 of these cases civil war or similar political instability has prevented the fulfillment of conservation objectives, and some degree of unrest or insurgency has had an impact on many other projects. The recommended survey of Angola has not been possible because of the state of civil war existing there for much of the time since the last plan was published. Political instability is unfortunately an increasing threat to the effective implementation of conservation programs in Africa.

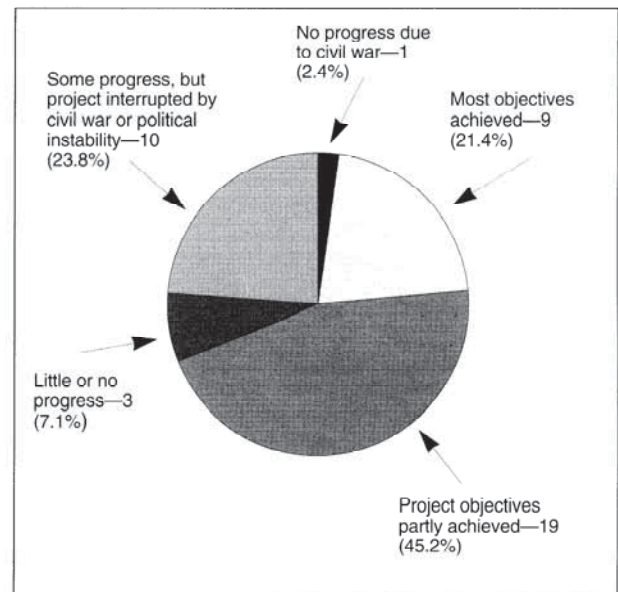


Figure 1. Summary of outcomes of projects reviewed in this chapter (see Table 4 for details).

Table 4
Outcomes of Projects Listed in 1986 Action Plan

Project	Country ^a	Project Priority Rating ^b	Outcome ^c
1. Conservation of Tai National Park	IVC	11	2
2. Development of Sapo National Park	LIB	10	4
3. Conservation of the Gola Forest	SLE	10	4
4. West Ghana Parks [rdm] ^d	GHA	10	3
5. Survey of Lofa-Mano	LIB	11	4
6. Survey of E. and C. Ivory Coast	IVC	12	3
7. Development of Korup National Park	CAM	10	2
8. Oban Hills Survey	NIG	12	2
9. Mamfe-Obudu Survey	CAM-NIG	13	1
10. Bioko [survey]	EQG	13	1
11. Development of Lopé Reserve	GAB	10	2
12. Dja Survey	CAM	11	2
13. Survey of Republic of Congo	CON	12	2
14. Northeastern Gabon [survey]	GAB	10	2
15. Central African Republic [rdm]	CAR	10	1
16. Lomako Forest [rdm]	ZAI	11	4
17. Survey of Wamba area	ZAI	11	4
18. Survey of Salonga National Park	ZAI	9	4
19. Lukenie-Sankuru [survey]	ZAI	9	4
20. Northeastern Angola [survey]	ZAI	9	5
21. Ituri Forest Survey	ZAI	10	1
22. Maiko Survey	ZAI	10	2
23. Kahuzi-Biega Conservation	ZAI	9	2
24. Survey of Republic of Guinea	GUI	9	2
25. Barbary Macaque Conservation	ALG-MOR-TUN	7	4
26. Management of Okomu Forest	NIG	10	2
27. Ondo and Ogun Survey	NIG	10	2
28. Niger-Cross Survey	NIG	10	1
29. Bwindi Forest Conservation	UGA	11	1
30. Virunga Volcanoes [rdm]	UGA-RWA-ZAI	7	4
31. Kibale Forest Conservation	UGA	10	1
32. Nyungwe-Kibira Conservation	BUR-RWA	8	4
33. Gombe Stream National Park [rdm]	TAN	5	1
34. Western Rift of Zaire [survey]	ZAI	9	2
35. Mahale Mountains Park Management	TAN	5	2
36. Simen Mountains Conservation	ETH	7	2
37. Bale Mountains [feasibility study]	ETH	7	2
38. Harrar Survey	ETH	7	3
39. Tana River Research	KEN	11	1 ^e
40. Kenya Coast Survey	KEN	8	2
41. Zanzibar Conservation	TAN	7	2
42. Udzungwa Mountains [rdm]	TAN	9	2

Key

^a Countries: ALG Algeria, BUR Burundi, CAM Cameroon, CAR Central African Republic, CON Congo, EQG Equatorial Guinea, ETH Ethiopia, GAB Gabon, GHA Ghana, GUI Guinea, IVC Ivory Coast, KEN Kenya, LIB Liberia, MOR Morocco, NIG Nigeria, RWA Rwanda, SLE Sierra Leone, TAN Tanzania, TUN Tunisia, UGA Uganda, ZAI Zaire.

^b Priority ratings in original plan.

^c Outcomes: 1 = Most or all project objectives achieved, at least in the short term; 2 = Project objectives only partly achieved (but civil unrest not largely responsible for this); 3 = Little or no progress in achieving objectives (but civil unrest is not largely responsible for this); 4 = Some progress made in achieving objectives, but war, civil unrest or political instability has interfered with the project; 5 = Little or no progress made, and civil war/unrest make progress unlikely in the near future.

^d [rdm] reserve development/management project

^e Security is a problem

Priorities for Action and Conclusions

Table 5 summarizes the recommendations given in Chapter 4 and also provides ratings of the relative priority of the further action recommended on the different projects. Projects are categorized as A-D based on the following criteria:

- A:** Projects that were recommended in the first plan, but on which little or no progress has been made, and where there is no serious political or other obstacle to undertaking the project.
- B:** Reserve establishment or survey projects recommended in the first plan, where surveys have now been conducted and potential reserve sites identified, but where no effective protected area has yet been established.
- C:** Continuing management and/or research projects at key sites listed in the first plan where some conservation progress has been made.
- D:** Projects recommended in the first plan that never commenced, or have been abandoned or interrupted because of warfare or political factors.

In Table 5, project priorities are rated from Medium to Very High, as follows:

*** Medium priority:**

Project area is home to one or more taxa of conservation concern and a conservation program already exists that provides these taxa with some degree of protection.

**** High priority:**

Project area is home to one or two taxa of conservation concern and the area has little or no protection.



Scott McGraw

Adult female Campbell's guenon (*Cercopithecus campbelli*) in the Tai Forest, Ivory Coast.

***** Very high priority:**

Project area is home to three or more taxa of conservation concern and has little or no protection; or, project area is the only known habitat of one or more endangered taxa.

()/(***):**

Project area is home to 1-2/>2 taxa of concern but warfare or other political factors make conservation efforts very difficult or impossible at this time.

Note: "Taxa of conservation concern" are species with a total rating of 4 or more in Table 3, or any subspecies listed in Table 4.

Table 5
Summary of Recommendations and Priorities Arising from Project Review

Project No.	Location	Project Category	Priority Rating	Taxa of Conservation Concern	Recommended Future Action
1	Taï National Park Côte d'Ivoire	C	*	<i>Cercopithecus diana diana</i> , <i>C. nictitans stampflii</i> , <i>Procolobus verus</i> , <i>Procolobus badius badius</i> , <i>Pan troglodytes verus</i>	Strengthen protection and monitor primate populations.
2	Sapo National Park Liberia	D	(***)	<i>Cercopithecus diana diana</i> , <i>C. nictitans stampflii</i> , <i>Procolobus verus</i> , <i>Procolobus badius badius</i> , <i>Pan troglodytes verus</i>	Assess rehabilitation needs when political situation allows.
3	Gola Forest and Tiwai Island, Sierra Leone	D	(***)	<i>Cercopithecus diana diana</i> , <i>Procolobus verus</i> , <i>Procolobus badius badius</i> , <i>Pan troglodytes verus</i>	Evaluate impact of rebel insurgency when political situation allows. Initiate conservation-oriented management of area between Gola West and Tiwai.
4	Western Ghana	A	***	<i>Cercocebus atys lunulatus</i> , <i>Cercopithecus diana roloway</i> , <i>Procolobus verus</i> , <i>Procolobus badius waldroni</i> , <i>Colobus vellerosus</i> , <i>Pan troglodytes verus</i>	Increase protection of Ankasa/Nini Suhien and Bia; survey status of forest primates throughout southwest Ghana.
5	Lofa-Mano, Liberia	D	(***)	<i>Cercopithecus diana diana</i> , <i>Procolobus verus</i> , <i>Procolobus badius badius</i> , <i>Pan troglodytes verus</i>	Undertake more surveys and determine feasibility of national park proposal when political situation allows.
6	Eastern and Central Côte d'Ivoire	A	***	<i>Cercocebus atys lunulatus</i> , <i>Cercopithecus diana roloway</i> , <i>Procolobus verus</i> , <i>Procolobus badius waldroni</i> , <i>Colobus vellerosus</i> , <i>Pan troglodytes verus</i>	Conduct surveys to determine status of <i>Cercocebus atys lunulatus</i> , <i>Cercopithecus diana roloway</i> and <i>Procolobus badius waldroni</i> , and to identify sites for their protection.
7	Korup National Park, Cameroon	C	**	<i>Arctocebus calabarensis</i> , <i>Euoticus pallidus</i> , <i>Mandrillus leucophaeus leucophaeus</i> , <i>Cercopithecus pogonias pogonias</i> , <i>Procolobus badius preussi</i> , <i>Pan troglodytes</i>	Improve protection, resettle people residing within the park, and study distribution and ecology of primates.

Continued on next page.

Project No.	Location	Project Category	Priority Rating	Taxa of Conservation Concern	Recommended Future Action
8	Oban Hills, Nigeria	B	***	<i>Arctocebus calabarensis</i> , <i>Euoticus pallidus</i> , <i>Mandrillus leucophaeus leucophaeus</i> , <i>Cercopithecus erythrotis erythrotis</i> , <i>Cercopithecus pogonias pogonias</i> , <i>Procolobus badius preussi</i> , <i>Pan troglodytes</i>	A national park has been declared but as yet it has little protection. Control hunting, undertake research on primate ecology, and improve cooperation with Korup management.
9A	Area between Mamfe, Cameroon and Obudu, Nigeria	B	***	<i>Euoticus pallidus</i> , <i>Mandrillus leucophaeus leucophaeus</i> , <i>Cercopithecus pogonias pogonias</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Establish conservation programs in the Takamanda Reserve, Cameroon, and the Afi River Forest Reserve, Nigeria; improve protection of the Okwangwo Division of the newly-established Cross River National Park, Nigeria.
9B	Mount Cameroon, Cameroon	B	***	<i>Euoticus pallidus</i> , <i>Mandrillus leucophaeus leucophaeus</i> , <i>Cercopithecus preussi preussi</i> , <i>Cercopithecus pogonias pogonias</i> , <i>Pan troglodytes</i>	Improve protection of Etinde Reserve and undertake more surveys in the area.
10	Bioko Island, Equatorial Guinea	B	***	<i>Mandrillus leucophaeus poensis</i> , <i>Cercopithecus preussi insularis</i> , <i>Cercopithecus erythrotis erythrotis</i> , <i>Cercopithecus pogonias pogonias</i> , <i>Procolobus badius pennantii</i> , <i>Colobus satanas</i>	Establish effective reserves in the Gran Caldera de Luba and on Pico Basilé. Institute long-term research programs.
11	Lopé Reserve, Gabon	C	*	<i>Arctocebus aureus</i> , <i>Euoticus elegantulus</i> , <i>Mandrillus sphinx</i> , <i>Cercopithecus solatus</i> , <i>Colobus satanas</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Delimit and make effective a fully protected core area. Continue research.
12	Dja Reserve, Cameroon	B	*	<i>Arctocebus aureus</i> , <i>Euoticus elegantulus</i> , <i>Colobus satanas</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Continue efforts to survey and develop the reserve.
13	Republic of Congo	A/B	***	<i>Arctocebus aureus</i> , <i>Euoticus elegantulus</i> , <i>Mandrillus sphinx</i> , <i>Miopithecus sp.</i> , <i>Allenopithecus nigroviridis</i> , <i>Procolobus badius bouvieri</i> , <i>Colobus satanas</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Continue development of effective management in the Odzala and Nouabale-Ndoki National Parks; conduct a status survey of <i>Procolobus badius bouvieri</i> ; survey region near the Gabon border.

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Project No.	Location	Project Category	Priority Rating	Taxa of Conservation Concern	Recommended Future Action
14A	Northeastern Gabon	B	***	<i>Arctocebus aureus</i> , <i>Euoticus elegantulus</i> , <i>Mandrillus sphinx</i> , <i>Miopithecus</i> sp., <i>Colobus satanas</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Evaluate the status of the Minkébé Reserve and produce a management plan; extend Ipassa-Makokou Reserve to the south.
14B	Southwestern Gabon	B	***	<i>Arctocebus aureus</i> , <i>Euoticus elegantulus</i> , <i>Mandrillus sphinx</i> , <i>Miopithecus</i> sp., <i>Colobus satanas</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Produce management plan for Gamba reserve complex, including measures to reduce the impact of oil exploration in the area.
15	Dzanga Region, Central African Republic	C	*	<i>Pan troglodytes</i> , <i>Gorilla gorilla</i>	Continue research and conservation work in the Dzanga-Sangha and Dzanga-Ndoki reserves.
16	Lomako Forest, Zaire	D	**	<i>Lophocebus aterrimus</i> , <i>Allenopithecus nigroviridis</i> , <i>Procolobus badius</i> , <i>Pan paniscus</i>	Renew efforts to establish a strict reserve.
17	Wamba, Zaire	C/D	***	<i>Cercopithecus dryas</i> , <i>Pan paniscus</i>	Re-establish research and conservation program.
18	Salonga National Park, Zaire	D	(***)	<i>Lophocebus aterrimus</i> , <i>Allenopithecus nigroviridis</i> , <i>Procolobus badius</i> , <i>Pan paniscus</i>	Revive research program when conditions allow; improve protection.
19	Lukenie-Sankuru, Zaire	A/D	***	<i>Cercocebus galeritus chrysogaster</i> , <i>Lophocebus aterrimus</i> ? <i>opdenboschi</i> , <i>Allenopithecus nigroviridis</i> , <i>Procolobus badius</i> , <i>Pan paniscus</i>	Conduct status survey of <i>Cercocebus galeritus chrysogaster</i> .
20	Northeastern Angola	D	(***)	<i>Lophocebus aterrimus opdenboschi</i> , <i>Cercopithecus ascanius atrinasus</i>	Conduct primate survey as soon as conditions allow.
21	Ituri Forest, Zaire	C	*	<i>Cercopithecus hamlyni</i> , <i>Procolobus badius</i> , <i>Pan troglodytes</i>	Conduct status surveys of <i>Cercopithecus hamlyni</i> and <i>Pan troglodytes</i> . Study threats to Okapi Wildlife Reserve posed by immigrant farmers.
22	Maiko National Park, Zaire	B	**	<i>Cercopithecus hamlyni</i> , <i>Procolobus badius</i> , <i>Gorilla gorilla graueri</i> , <i>Pan troglodytes</i>	Extend surveys, improve protection and develop management plan.

Continued on next page.

Project No.	Location	Project Category	Priority Rating	Taxa of Conservation Concern	Recommended Future Action
23	Kahuzi-Biega National Park, Zaire	C	*	<i>Cercopithecus hamlyni</i> , <i>Procolobus badius</i> , <i>Gorilla gorilla graueri</i> , <i>Pan troglodytes</i>	Settle disputed park boundaries; improve protection; monitor primate populations.
24	"Casamance": Senegal, Guinea and Guinea-Bissau	B/D	**	<i>Procolobus badius temminckii</i> , <i>Pan troglodytes</i>	Establish one or more parks in Guinea-Bissau and consider a transfrontier protected area with Guinea; survey Forêt de Fathala, Senegal; restore functioning of Basse Casamance National Park, Senegal, when conditions allow.
25	"Maghreb": Morocco and Algeria	C/D	***	<i>Macaca sylvanus</i>	Morocco—conduct further status surveys of <i>Macaca sylvanus</i> and improve habitat protection; Algeria—increase protection, particularly of the Parc National du Djurdjura, and resume international research efforts when political conditions allow.
26	Okomu Forest Reserve, Nigeria	C	*	<i>Cercopithecus erythrogaster</i> , (<i>Pan troglodytes</i> ?)	Institute an effective conservation program in the Forest Reserve outside the core sanctuary.
27	Ondo and Ogun States, Nigeria	A/B	**	<i>Cercopithecus erythrogaster</i> , <i>Pan troglodytes</i>	Conduct further surveys in Ondo and identify and develop a protected area; in Ogun, support conservation and research program in the Omo Forest Reserve.
28	Niger-Cross Region, Nigeria	B	***	<i>Cercopithecus sclateri</i>	Establish sustainable conservation projects for remaining <i>Cercopithecus sclateri</i> populations, including Stubbs Creek Reserve, Akwa Ibom State.
29	Bwindi-Impenetrable Forest National Park, Uganda.	C	*	<i>Pan troglodytes</i> , <i>Gorilla gorilla beringei</i>	Continue ecological research on gorillas; expand scope of ecotourism; develop buffer zone.

Continued on next page.

Project No.	Location	Project Category	Priority Rating	Taxa of Conservation Concern	Recommended Future Action
30	Virunga Volcanoes: Rwanda, Zaire and Uganda	C/D	*	<i>Cercopithecus mitis kandti</i> , <i>Gorilla gorilla beringei</i>	Continue to monitor and closely-protect gorillas; study problems associated with tourism; in Rwanda, rebuild research and conservation program.
31	Kibale Forest National Park, Uganda	C	*	<i>Procolobus badius tephrosceles</i> , <i>Pan troglodytes</i>	Continue primate studies and support development of field station.
32A	Nyungwe Forest, Rwanda	D	***	<i>Cercopithecus hamlyni</i> , <i>Cercopithecus mitis kandti</i> , <i>Colobus angolensis ruwenzorii</i> , <i>Pan troglodytes</i>	Continue research and management programs; conduct status survey of all primates.
32B	Kibira Forest, Burundi	D	(**)	<i>Colobus angolensis ruwenzorii</i> , <i>Pan troglodytes</i>	Re-evaluate status of forest and conduct status surveys of all primates.
33	Gombe National Park, Tanzania	C	*	<i>Procolobus badius tephrosceles</i> , <i>Pan troglodytes</i>	Examine how to reduce impact of large human population adjacent to park; control problems associated with tourism.
34	Western Rift, Zaire	B	***	<i>Cercopithecus hamlyni kahuziensis</i> , <i>Cercopithecus mitis kandti</i> , <i>Procolobus badius semlikiensis</i> , <i>Procolobus badius foai</i> , <i>Colobus angolensis ruwenzorii</i> , <i>Pan troglodytes</i> , <i>Gorilla gorilla beringei/grauei</i>	Continue surveys; secure Itombwe and Tschiaberimu Forests and study gorilla populations.
35	Mahale Mountains National Park, Tanzania	C	*	<i>Procolobus badius tephrosceles</i> , <i>Colobus angolensis</i> ?subsp., <i>Pan troglodytes</i>	Relocate human settlements from inside park; improve protection; continue primate studies; extend conservation efforts to Kasakati-Ugalla area.
36	Simien Mountains National Park, Ethiopia	C	*	<i>Theropithecus gelada</i> , <i>Colobus guereza guereza</i>	Status survey of <i>Colobus guereza</i> ; study human impacts.

Continued on next page.

Project No.	Location	Project Category	Priority Rating	Taxa of Conservation Concern	Recommended Future Action
37	Bale Mountains, Ethiopia	C	*	<i>Cercopithecus aethiops djamdjamensis</i> , <i>Colobus guereza guereza</i> , <i>Theropithecus gelada</i>	Status survey of <i>Cercopithecus aethiops djamdjamensis</i> and <i>Colobus guereza</i> ; study conservation needs of Indeltu population of <i>Theropithecus gelada</i> .
38	Harrar, Ethiopia	A	***	<i>Colobus guereza gallarum</i>	Conduct <i>Colobus guereza gallarum</i> status survey.
39	Tana River, Kenya	C	***	<i>Cercocebus galeritus galeritus</i> , <i>Cercopithecus albogularis albоторquatus</i> , <i>Procolobus badius rufomitatus</i>	Continue surveys and monitoring of red colobus and mangabeys, and develop long-term management plan for the primates and their habitat; resist plans for new dams on upper Tana River.
40	Kenya Coast	C	*	<i>Cercopithecus albogularis albоторquatus</i>	Conduct further surveys and institute stricter management of remaining forest.
41	Zanzibar, Tanzania	C	***	<i>Procolobus badius kirkii</i>	Upgrade Jozani Forest to national park status and develop management plan, including controlled tourism program.
42	Udzungwa Mountains and Magombera Forest, Tanzania	C	***	<i>Cercocebus galeritus "sanjei"</i> , <i>Procolobus badius gordonorum</i>	Gazette Magombera Forest as part of Selous Game Reserve; improve protection of Udzungwa Mountains and Magombera Forest; establish long-term study of red colobus and mangabeys.

Recommendations for New Projects

All endangered or vulnerable African primate species are included in one of the recommended projects for future action arising from projects listed in the first Action Plan and reviewed in Chapter 4. But three distinct primate populations of considerable concern (rating 4 or greater in Table 4) are not included in these projects, and efforts should be made to learn more about their status and to take any necessary measures to improve their protection. These populations are:

1. *Cercopithecus albogularis zammaranoi* of southern Somalia.
2. The red-bellied form of *Cercopithecus erythrogaster*, which has been found to survive in a remnant of dry forest, the Lama forest of Benin.
3. *Procolobus badius epieni* in the Niger Delta of Nigeria.

In addition, the several newly-described galago forms from Malawi and Tanzania, some of which appear to be new species, need to be further studied and their status evaluated. Some may require conservation attention.

The large number of highly localized and threatened populations of red colobus monkeys that have appeared in this analysis suggests the need for a **Red Colobus Conservation Action Plan**, along the lines of the recently-published **Action Plan for *Pan paniscus*** (Thompson-Handler *et al.* 1995). Several kinds of red colobus are among the most endangered of all African primates. Some distinct forms of red colobus occur in no formal wildlife conservation area, and some that are found in legally-protected areas in fact have very weak protection. Because the genetic distinctiveness and evolutionary relationships of the different red colobus populations are very poorly understood, basic research on these issues should be a component of any integrated conservation program.

Because red colobus do not do well in captivity, a conservation plan must focus on *in situ* actions. Such a plan, designed to improve the survival prospects of each threatened form and of the diversity of red colobus as a whole, would also lead to the better protection of many other threatened African primates that occur sympatrically with red colobus.

Concluding Comments

The number of projects recommended in the original plan that have been disrupted by civil war and insecurity demonstrates that, in Africa especially, conservation cannot be viewed outside the context of political and economic conditions. While this plan gives some specific recommendations for future action, it must be kept in mind that the prospects for the long-term success of many conservation projects are poor unless better government and stronger indigenous institutions take hold in more African countries, unless civil wars subside, and unless economic circumstances and educational opportunities improve. Improving governance in Africa is, of course, outside the scope of the Primate Specialist Group, but where primatologists have input to conservation planning it is important that they stress the significance of the political context of conservation.

This plan has laid emphasis on specific actions at particular sites, but research projects that address widespread conservation problems can also make very important contributions. For instance, more research is needed on the impact which human land-use practices, such as hunting, logging and shifting cultivation, have on primates and other wildlife. It is also becoming increasingly important that we design research to examine the effectiveness of conservation projects themselves, analyzing the causes of successes and failures, and assessing the extent to which lessons learned at one site can be generalized to others.

References

- Agbelusi, E.A. 1994. Wildlife conservation in Ondo State. *Nigerian Field* 59: 73-83.
- Aveling, C. & Harcourt, A.H. 1994. A census of Virunga gorillas. *Oryx* 18: 8-13.
- Barnett, A., Prangley, M., Hayman, P.V., Djirimba, D. & Koman, J. 1994. A preliminary survey of Kounoukan Forest, Guinea, West Africa. *Oryx* 28: 269-275.
- Bearder, S.K., Honess, P.E. & Ambrose, L. 1995. Species diversity among galagos with special reference to mate recognition. Pp. 331-352 in L. Alterman, G.A. Doyle & M.K. Izard (eds.) *Creatures of the Dark: The Nocturnal Prosimians*. New York: Plenum.
- Berhanu, L. 1974. Present status of primates in Ethiopia and their conservation. *Symp. 5th. Congr. Int. Primatol. Soc.*: 525-528.
- Bermejo, M. 1994. *Recensement des gorilles et chimpanzés du Parc National d'Odzala*. ECOFAC/AGRECO/CTFT.
- Booth, A.H. 1958. The zoogeography of west African primates: A review. *Bull. de l'I.F.A.N.* 20, sér. A: 587-622.
- Blom, A., Alers, M.P.T., Feistner, A.T.C., Barnes, R.F.W. & Barnes, K.L. 1992. Primates in Gabon - current status and distribution. *Oryx* 26: 223-234.
- Burnham, O. 1995. Senegalese national park devastated by rebels. *Oryx* 29: 5-6.
- Butynski, T.M. 1985. Primates and their conservation in the Impenetrable (Bwindi) Forest, Uganda. *Primate Conservation* 6: 68-72.
- Butynski, T.M. & Kalina, J. 1993. Three new mountain national parks for Uganda. *Oryx* 27: 214-224.
- Butynski, T.M. & Koster, S.H. 1994. Distribution and conservation status of primates in Bioko Island, Equatorial Guinea. *Biodiversity and Conservation* 3: 893-910.
- Butynski, T.M. & Mwangi, G. 1994. Conservation status and distribution of the Tana River Red Colobus and Crested Mangabey. Report to Zoo Atlanta, the Kenya Wildlife Service and others.
- Butynski, T.M., Werikhe, S. & Kalina, J. 1990. Status, distribution and conservation of the mountain gorilla in the Gorilla Game Reserve, Uganda. *Primate Conservation* 11: 31-41.
- Caldecott, J.O., Oates, J.F. & Ruitenbeek, H.J. 1990. *Cross River National Park (Okwangwo Division): Plan for Developing the Park and its Support Zone*. Godalming: WWF UK.
- Carpaneto, G.M. 1994. La découverte du colobe noir au Congo, à la limite du parc national d'Odzala. *Canopée* 3: 7.
- Carpaneto, G.M. & Gippoliti, S. 1990. Primates of the Harena Forest, Ethiopia. *Primate Conservation* 11: 12-15.
- Carroll, R. 1990. In the garden of the gorillas. *Wildlife Conservation* 93: 50-63.
- Charles-Dominique, P. 1977. *Ecology and Behavior of Nocturnal Prosimians*. London: Duckworth.
- Collar, N.J. & Stuart, S.N. 1988. *Key Forests for Threatened Birds in Africa*. Cambridge: ICBP.
- Colell, M., Mate, C. & Fa, J.E. 1994. Hunting among Moka Bubis: dynamics of faunal exploitation at the village level. *Biodiversity and Conservation* 3: 939-950.
- Colyn, M. 1988. Distribution of guenons in the Zaire-Lualaba- Lomami river system. Pp. 104-124 in A. Gautier-Hion, F. Bourlière, J.-P. Gautier & J. Kingdon (eds.) *A Primate Radiation: Evolutionary Biology of the African Guenons*. Cambridge: Cambridge University Press.
- Colyn, M. 1991. L'importance zoogéographique du bassin du fleuve Zaire pour la spéciation: le cas des Primates Simiens. *Annales du Musée royal de l'Afrique Centrale (Sciences Zoologiques)* 264: 1-254.
- Colyn, M. 1993. Coat colour polymorphism of red colobus monkeys (*Colobus badius*, Primates, Colobinae) in eastern Zaire: taxonomic and biogeographic implications. *Journal of African Zoology* 107: 301-320.
- Colyn, M., Gautier-Hion, A. & Thys van den Audenaerde, D. 1991. *Cercopithecus dryas* Schwarz 1932 and *C. salongo* Thys van den Audenaerde 1977 are the same species with an age-related coat pattern. *Folia Primatologica* 56: 167-170.
- Colyn, M., Gautier-Hion, A. & Verheyen, W. 1991. A reappraisal of palaeoenvironmental history in Central Africa: evidence for a major fluvial refuge in the Zaire Basin. *Journal of Biogeography* 18: 403-407.
- Dandelot, P. 1971. Classification of African Anthropoidea, in J. Meester & H.W. Setzer (eds.) *The Mammals of Africa: An Identification Manual*. Washington, D.C.: Smithsonian Institution Press.

- Dandelot, P. & Prevost, J. 1972. Contribution à l'étude des primates d'Ethiopie (Simiens). *Mammalia* 36: 607-633.
- Davies, A.G. 1987. *The Gola Forest Reserves, Sierra Leone: Wildlife Conservation and Forest Management*. Gland: IUCN.
- Decker, B.S. 1994a. Endangered primates in the Selous Game Reserve and an imminent threat to their habitat. *Oryx* 28: 183-190.
- Decker, B.S. 1994b. Effects of habitat disturbance on the behavioral ecology and demographics of the Tana River red colobus (*Colobus badius rufomitratu*s). *International Journal of Primatology* 15: 703-737.
- Dosso, H., Guillaumet, J.L. & Hadley, M. 1981. The Tai project: Land use problems in a tropical rain forest. *Ambio* 10: 120-125.
- Dunbar, R.I.M. 1977. The gelada baboon: Status and conservation. Pp. 363-383 in H.S.H. Prince Rainier & G.H. Bourne (eds.) *Primate Conservation*. New York: Academic Press.
- Dunn, A. 1991. *A Study of the Relative Abundance of Primate and Duiker Populations in Liberia*. A report to WWF/FDA.
- Eisenraut, M. 1973. Die wirbeltierfauna von Fernando Poo and Westkamerun. *Bonner Zoologische Monographien*, no. 3.
- Eudey, A.A. 1987. *Action Plan for Asian Primate Conservation 1987-1991*. Gland: IUCN.
- Fa, J.E. 1983. The Barbary macaque—the future. *Oryx* 17: 62-67.
- . 1992. Conservation in Equatorial Guinea. *Oryx* 26: 87-94.
- Fa, J.E. & Juste, J. (eds.) 1994. Biodiversity conservation in the Gulf of Guinea islands. *Biodiversity and Conservation*, special issue, 3(9).
- Fa, J.E., Taub, N., Ménard, N. & Stewart, P.J. 1984. The distribution and current status of the barbary macaque in North Africa. Pp. 79-111 in J.E. Fa (ed.) *The Barbary Macaque: A Case Study in Conservation*. Plenum: New York.
- Fay, J.M. & Agnagna, M. 1992. Census of gorillas in northern Republic of Congo. *American Journal of Primatology* 27: 275-284.
- Gadsby, E.L. & Jenkins, P.D. 1992. *Report on Wildlife and Hunting in the Proposed Etinde Forest Reserve*. Report to the Forestry Department, Ministry of Agriculture, Government of Cameroon.
- Galat, G., Benoit, M., Chevillote, H., Diop, A., Duplantier, J.-M., Galat-Luong, A. & Pichon, G. 1992. *Denombrement de la Grande Faune du Parc National du Niokolo Koba, Sénégal, 1990-1991: Résumé*. Ministère du Tourisme et de l'Environnement, Direction des Parcs Nationaux & ORSTOM, Dakar.
- Galat, G. & Galat-Luong, A. 1985. La communauté de primates diurnes de la forêt de Tai, Côte-d'Ivoire. *Terre Vie* 40: 3-32.
- Gartlan, J.S. 1975. The African coastal rain forest and its primates—threatened resources. Pp. 67-82 in G. Bermant & D.G. Lindburg (eds.) *Primate Utilization and Conservation*. New York: J. Wiley.
- Gartlan, J.S. 1982. The forests and primates of Ghana: Prospects for protection and proposals for assistance. *Lab. Primate Newsletter* 21: 1-14.
- Gartlan, J.S. & Struhsaker, T.T. 1972. Polyspecific associations and niche separation of rain-forest anthropoids in Cameroon, West Africa. *J. Zool.* 168: 221-266.
- Gautier-Hion, A. 1966. L'Ecologie et l'ethologie du talapoin *Miopithecus talapoin talapoin*. *Biologica Gabonica* 2: 311-329.
- Gautier-Hion, A., Bourlière, F., Gautier, J.-P. & Kingdon, J. 1988. *A Primate Radiation: Evolutionary Biology of the African Guenons*. Cambridge: Cambridge University Press.
- Gautier, J.-P. 1988. Interspecific affinities among guenons as deduced from vocalizations. Pp. 194-226 in A. Gautier-Hion, F. Bourlière, J.-P. Gautier & J. Kingdon (eds.) *A Primate Radiation: Evolutionary Biology of the African Guenons*. Cambridge: Cambridge University Press.
- Gautier, J.-P. & Gautier-Hion, A. 1969. Les associations polyspécifiques chez les Cercopithecidae du Gabon. *Terre Vie* 23: 164-201.
- Gautier-Hion, A. & Maisels, F. 1994. Mutualism between a leguminous tree and large African monkeys as pollinators. *Behavioral Ecology and Sociobiology* 34: 203-210.
- Gippoliti, S. & Dell'Omo, G. 1994. *Chimpanzees in Guinea-Bissau, West Africa*. A preliminary report to the IUCN/SSC Primate Specialist Group and the CCCC.
- Goodall, J. 1986. *The Chimpanzees of Gombe*. Cambridge, Mass.: Harvard University Press.
- Goode, S.J. 1991. *A phylogenetic and vicariance analysis of some African forest mammals*. Ph.D. thesis, University of Liverpool.
- Groves, C.P. 1978. Phylogenetic and population systematics of the mangabeys (Primates: Cercopithecidae). *Primates* 19: 1-34.
- . 1989. *A Theory of Human and Primate Evolution*. Oxford: Oxford University Press.
- Hamilton, A.C. 1988. Guenon evolution and forest history. Pp. 13-34 in A. Gautier-Hion, F. Bourlière, J.-P. Gautier & J. Kingdon (eds.) *A Primate Radiation: Evolutionary Biology of the African Guenons*. Cambridge: Cambridge University Press.
- Harcourt, A.H. 1981. Can Uganda's gorillas survive?—A survey of the Bwindi Forest Reserve. *Biological Conservation* 19: 269-282.
- Harcourt, A.H. & Curry-Lindahl, K. 1979. Conservation

- of the mountain gorilla and its habitat in Rwanda. *Environmental Conservation* 6: 143-147.
- Harcourt, A.H., Stewart, K.J. & Inaharo, I.M. 1989. Gorilla quest in Nigeria. *Oryx* 23: 7-13.
- Harrison, M.J. 1988. A new species of guenon (genus *Cercopithecus*) from Gabon. *Journal of Zoology, London* 215: 561-575.
- Hart, J.A., Hart, T.B. & Thomas, S.C. 1986. The Ituri forest of Zaire: primate diversity and prospects for conservation. *Primate Conservation* 7: 42-44.
- Hart, T.B., Hart, J.A. & Murphy, P.G. 1989. Monodominant and species-rich forests of the humid tropics: causes for their co-occurrence. *American Naturalist* 133: 613-633.
- Hart, J.A. & Sikubwabo, C. 1994. Exploration of the Maiko National Park of Zaire 1989-1992: History, environment and the distribution status of large mammals. *Working Paper Series*, no. 2, Wildlife Conservation Society, New York.
- Hayes, V.J., Freedman, L. & Oxnard, C.E. 1990. The taxonomy of savannah baboons: an odontometric analysis. *American Journal of Physical Anthropology* 22: 171-190.
- Homewood, K.M. & Rodgers, W.A. 1981. A previously undescribed mangabey from southern Tanzania. *Int. J. Primatol.* 2: 47-55.
- Hoppe-Dominik, B. 1991. Distribution and status of chimpanzees (*Pan troglodytes verus*) on the Ivory Coast. *Primate Report* 31: 45-75.
- IUCN Species Survival Commission. 1994. *IUCN Red List Categories*. Gland: IUCN.
- Jolly, C.J. 1993. Species, subspecies, and baboon systematics. Pp. 67-107 in W.H. Kimbel & L.B. Martin (eds.) *Species, Species Concepts, and Primate Evolution*. New York: Plenum.
- Kano, T. 1984. Distribution of pygmy chimpanzees (*Pan paniscus*) in the Central Zaire basin. *Folia Primatologica* 43: 36-52.
- King, S. 1994. Utilisation of wildlife in Bakossiland, West Cameroon. *Traffic Bulletin* 14: 63-73.
- Kingdon, J. 1971. *East African Mammals: An Atlas of Evolution in Africa*, vol. 1. London: Academic Press.
- . 1990. *Island Africa: The Evolution of Africa's Rare Animals and Plants*. London: Collins.
- Kuhn, H.-J. 1965. A provisional check-list of the mammals of Liberia. *Senck. biol.* 46: 321-340.
- Lahm, S.A. 1993. Utilization of forest resources and local variation of wildlife populations in northeastern Gabon. Pp. 213-226 in C.M. Hladik et al. (eds.) *Tropical Forests, People and Food*. Paris: Unesco and Parthenon Publishing.
- Lernould, J.-M. 1988. Classification and geographical distribution of guenons: a review. Pp. 54-78 in A. Gautier-Hion, F. Bourlière, J.-P. Gautier & J. Kingdon (eds.) *A Primate Radiation: Evolutionary Biology of the African Guenons*. Cambridge: Cambridge University Press.
- Mace, G., Collar, N., Cooke, J., Gaston, K., Ginsberg, J., Leader-Williams, N., Maunder, M. & Milner-Gulland, E.J. 1993. *The development of new criteria for listing species on the IUCN Red List*. Unpublished IUCN working paper.
- Mace, G.M. & Lande, R. 1991. Assessing extinction threats: toward a reevaluation of IUCN threatened species categories. *Conservation Biology* 5: 148-157.
- Machado, A. de Barros. 1969. Mamíferos de Angola ainda não citados ou pouco conhecidos. *Publicações culturais da Companhia de Diamantes de Angola*, no. 46: 93-232.
- Madgwick, J. 1989. Somalia's threatened forests. *Oryx* 23: 94-101.
- Maier, W. 1980. Konstruktionsmorphologische Untersuchungen am Gebiss der rezenten Prosimiae (Primates). *Abhandlungen der Senckenburgische-Naturforschenden Gesellschaft* 538: 1-158.
- Marsh, C.W. 1978. Problems of primate conservation in a patchy environment along the lower Tana River, Kenya. Pp. 85-86 in D.J. Chivers & W. Lane Petter (eds.) *Recent Advances in Primatology* 2. London: Academic Press.
- . 1985. *A Resurvey of Tana River Primates*. Report to the Institute of Primate Research and Dept. of Wildlife Conservation and Management, Nairobi, Kenya.
- Martin, C. 1991. *The Rainforests of West Africa: Ecology—Threats—Conservation*. Basel: Birkhäuser.
- McGrew, W.C., Baldwin, P.J. & Tutin, C.E.G. 1981. Chimpanzees in a hot, dry and open habitat: Mt. Asserik, Senegal, West Africa. *Journal of Human Evolution* 10: 227-244.
- Misonne, X. 1963. *Les Rongeurs du Ruwenzori et des Régions voisines*. Brussels: Inst. des Parcs Nat. du Congo et du Rwanda.
- Mitani, M. 1990. A note on the present situation of the primate fauna found from southeastern Cameroon to northern Congo. *Primates* 31: 625-634.
- Mittermeier, R.A., Konstant, W.R., Nicoll, M.E. & Langrand, O. 1992. *Lemurs of Madagascar: An Action Plan for their Conservation 1993-1999*. Gland: IUCN.
- Moore, J. 1985. Chimpanzee survey in Mali, West Africa. *Primate Conservation* 6: 59-63.
- Morell, V. 1994. Will primate genetics split one gorilla into two? *Science* 265: 1661.
- Morin, P.A., Moore, J.J., Chakraborty, R., Jin, L., Goodall, J. & Woodruff, D.S. 1994. Kin selection, social structure, gene flow, and the evolution of chimpanzees. *Science* 265: 1193-1201.
- Napier, P.H. 1981. *Catalogue of Primates in the British Museum (Natural History) and Elsewhere in the British*

- Isles. Part II: Family Cercopithecidae, Subfamily Cercopithecinae*. London: British Museum (Natural History).
- Nash, L.T., Bearder, S.K. & Olson, T.R. 1989. Synopsis of Galago species characteristics. *International Journal of Primatology* 10: 57-80.
- Nishida, T., Itani, J., Hiraiwa, M. & Hasegawa, T. 1981. A newly-discovered population of *Colobus angolensis* in East Africa. *Primates* 22: 557-563.
- Oates, J.F. 1982. In search of rare forest primates in Nigeria. *Oryx* 16: 431-436.
- . 1985. The Nigerian guenon, *Cercopithecus erythrogaster*: ecological, behavioral, systematic and historical observations. *Folia Primatologica* 45: 25-43.
- Oates, J.F., Anadu, P.A., Gadsby, E.L. & Werre, J.L. 1992. Sclater's guenon—a rare Nigerian monkey threatened by deforestation. *National Geographic Research and Exploration* 8: 476-491.
- Oates, J.F., Whitesides, G.H., Davies, A.G., Waterman, P.G., Green, S.M., Dasilva, G.L. & Mole, S. 1990. Determinants of variation in tropical forest primate biomass: new evidence from West Africa. *Ecology* 71: 328-343.
- Olson, T.R. 1979. *Studies on Aspects of the Morphology and Systematics of the Genus Otolemur Coquerel, 1859 (Primates: Galagidae)*. Ph.D. Thesis, University of London.
- Riezebos, E.P., Vooren, A.P. & Guillaumet, J.L. (eds.) 1994. *Le Parc Nationale de Taï, Côte d'Ivoire. I. Synthèse des Connaissances*. Wageningen: La Fondation Tropenbos.
- Robinson, P.T. 1971. Wildlife trends in Liberia and Sierra Leone. *Oryx* 11: 117-122.
- Robinson, P.T. 1983. Birth pains for Sapo National Park in Liberia. *IUCN/SSC Specialist Group Newsletter*, no. 3: 23-24.
- Rodgers, W.A. & Homewood, K.M. 1982. Biological values and conservation prospects for the forests and primate populations of the Uzungwa Mountains, Tanzania. *Biological Conservation* 24: 285-304.
- Ruvolo, M., Pan, D., Zehr, S., Goldberg, T., Disotell, T.R. & von Dornum, M. 1994. Gene trees and hominoid phylogeny. *Proc. Natl. Acad. Sci. USA* 91: 8900-8904.
- Sabater Pi, J. & Jones, C. 1967. Notes on the distribution and ecology of the higher primates of Rio Muni, West Africa. *Tulane Studies in Zoology* 14: 101-109.
- Schouteden, H. 1944. De Zoogdieren van Belgisch Congo en van Ruanda-Urundi. I. Primates, Chiroptera, Insectivora, Pholidota. *Annls. Mus. r. Congo belge*, Ser. 4to., C. Zool. ser. II 3: 1-168.
- Schwartz, J. 1996. *Pseudopotto martini*: a new genus and species of extant loriform primate. *Anthrop. Pap. Amer. Mus. Nat. Hist.* 78:1-14.
- Silkiluwasha, F. 1981. The distribution and conservation status of the Zanzibar red colobus. *African Journal of Ecology* 19: 187-194.
- Starin, E.D. 1989. Threats to the monkeys of The Gambia. *Oryx* 23: 208-214.
- Stevenson, M., Baker, A. & Foose, T.J. 1992. *Conservation Assessment and Management Plan for Primates*. IUCN/SSC Captive Breeding Specialist Group.
- Struhsaker, T.T. 1981. Forest and primate conservation in East Africa. *African Journal of Ecology* 19: 99-114.
- Sugiyama, Y. & Soumah, A.G. 1988. Preliminary survey of the distribution and population of chimpanzees in the Republic of Guinea. *Primates* 29: 569-574.
- Susman, R.L. & Mubalamata, K.K. 1984. Update on the pygmy chimp in Zaire. *IUCN/SSC Primate Specialist Group Newsletter* no. 4: 34-36.
- Thomas, S.C. 1991. Population densities and patterns of habitat use among anthropoid primates of the Ituri Forest, Zaire. *Biotropica* 23: 68-83.
- Thompson-Handler, N., Malenky, R.K. & Reinartz, G.E. 1995. (eds.) *Action Plan for Pan paniscus: Report on Free-ranging Populations and Proposals for Their Preservation*. Milwaukee, Wisconsin: Zoological Society of Milwaukee County.
- Tutin, C.E.G. & Fernandez, M. 1984. Nationwide census of gorilla (*Gorilla g. gorilla*) and chimpanzee (*Pan t. troglodytes*) populations in Gabon. *American Journal of Primatology* 6: 313-336.
- Varty, N. 1988. Mammals and problems of their conservation in the riverine forests of the Jubba Valley, southern Somalia. *Tropical Zoology* 1: 179-192.
- Verschuren, J. 1982. Hope for Liberia. *Oryx* 16: 421-427.
- Weber, A.W. 1987. Socioecologic factors in the conservation of Afromontane Forest Reserves. Pp. 205-229 in C.W. Marsh & R.A. Mittermeier (eds.) *Primate Conservation in the Tropical Rain Forest*. New York: Alan R. Liss.
- Weber, A.W. & Vedder, A. 1983. Population dynamics of the Virunga gorillas 1959-78. *Biol. Conserv.* 26: 341-366.
- White, L.J.T. 1992. *Vegetation History and Logging Disturbance: Effects on Rain Forest Mammals in the Lopé Reserve, Gabon (With Special Emphasis on Elephants and Apes)*. Ph.D. Thesis, University of Edinburgh.
- White, L.J.T. & Mackanga-Missandzou, A. 1995. Good news for *Cercopithecus solatus*, Gabon's endemic guenon. *African Primates* 1: 6-8.
- Wilkie, D.S., Sidle, J.G. & Boundzanga, G.C. 1992. Mechanized logging, market hunting, and a bank loan in Congo. *Conservation Biology* 6: 570-580.
- World Resources Institute. 1994. *World Resources 1994-95*. New York: The World Resources Institute.
- Yalden, D.W., Largen, M.J. & Kock, D. 1977. Catalogue

- of the mammals of Ethiopia. 3. Primates. *Monitore Zoologica Italia* 9 (suppl.): 1-52.
- Yamigawa, J., Mwanza, N., Spangenberg, A., Maruhashi, T., Yumoto, T., Steinhauer, B.B. & Refisch, J. 1992. Population density and ranging pattern of chimpanzees in Kahuzi-Biega National Park, Zaire: a comparison with a sympatric population of gorillas. *African Study Monographs* 13: 217-230.
- Yamigawa, J., Mwanza, N., Spangenberg, A., Maruhashi, T., Yumoto, T. & Steinhauer, B.B. 1993. A census of the eastern lowland gorillas *Gorilla gorilla graueri* in Kahuzi-Biega National Park with reference to mountain gorillas *G. g. beringei* in the Virunga region, Zaire. *Biological Conservation* 64: 83- 89.

Appendix 1

Country Species Lists

Many factors obviously affect primate species richness in a single country, but the most important are habitat diversity, total area of moist forest, and the number of different regionally distinct faunas contained within the country's boundaries; the country's total area is relatively unimportant. Zaire is the African country containing the largest number of primate species (33-34). Zaire is very large, but it also has high habitat diversity (including moist forest, swamp forest, savanna and montane vegetation), and a large area of moist forest; it contains members of four different major regional forest primate faunas (Congo Basin, Eastern Zaire, Western Rift and, in the Mayombe area north of the Congo River's mouth, Western Equatorial). However, Cameroon is only one-fifth the size of Zaire, yet it has almost as many primate species (31), largely as a result of containing two different and very species-rich forest communities to the north and south of the Sanaga River. Equatorial Guinea is only about one-hundredth the size of Zaire, but it still has 22 species; each of its two widely-separated components (the island of Bioko and mainland Rio Muni) falls within a different regional community.

Listed here are the species known to occur in African countries that have at least 10 primate species. Where a species name is shown in parentheses, with a query, we have not been able to locate a reliable published record or museum specimen from that country, but the species is expected to be present on biogeographic grounds. Endemic species (known only from that country) are indicated with an asterisk (*). An (e?) indicates that a species was known in that country within the last 50 years, but may now be extinct. The only species not present in this list is the Barbary macaque (*Macaca sylvanus*), which is the sole primate species in Morocco and Algeria. The species lists are obviously susceptible to changes in taxonomy; in particular, the number of species in Tanzania may change significantly with revisions in the taxonomy of galagos and red colobus.

Zaire

(2,345,000 km², 33-34 species)

Family Lorisidae

Subfamily Lorisinae

(*Arctocebus aureus*?)

Perodicticus potto

Subfamily Galaginae

Otolemur crassicaudatus

Galago matschiei

Galago senegalensis

Galago moholi

Galagoides demidoff

Galagoides thomasi

Euoticus elegantulus

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus galeritus

Lophocebus albigena

Lophocebus aterrimus

Papio anubis

Papio cynocephalus

*Cercopithecus dryas**

Cercopithecus neglectus

Cercopithecus hamlyni

Cercopithecus lhoesti

Cercopithecus mitis

Cercopithecus nictitans

Cercopithecus cephus

Cercopithecus ascanius

Cercopithecus pogonias

Cercopithecus wolffi

Cercopithecus aethiops

Miopithecus talapoin

Allenopithecus nigroviridis

Erythrocebus patas

Subfamily Colobinae

Procolobus badius

Colobus guereza

Colobus angolensis

Family Pongidae

Pan troglodytes
*Pan paniscus**
Gorilla gorilla

Cameroon

(475,000 km², 31 species)

Family Lorisidae

Subfamily Lorisinae

Arctocebus calabarensis
Arctocebus aureus
Perodicticus potto

Subfamily Galaginae

Galago alleni
Galago senegalensis
Galagoides demidoff
Galagoides thomasi
Euoticus elegantulus
Euoticus pallidus

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus torquatus
Cercocebus galeritus
Lophocebus albigena
Mandrillus sphinx
Mandrillus leucophaeus
Papio anubis
Cercopithecus neglectus
Cercopithecus preussi
Cercopithecus nictitans
Cercopithecus erythrotis
Cercopithecus cephus
Cercopithecus mona
Cercopithecus pogonias
Cercopithecus aethiops
Miopithecus sp.
Allenopithecus nigroviridis
Erythrocebus patas

Subfamily Colobinae

Procolobus badius
Colobus guereza
Colobus satanas

Family Pongidae

Pan troglodytes
Gorilla gorilla

Nigeria

(924,000 km², 26 species)

Family Lorisidae

Subfamily Lorisinae

Arctocebus calabarensis
Perodicticus potto

Subfamily Galaginae

Galago alleni
Galago senegalensis
Galagoides demidoff
Galagoides thomasi
Euoticus pallidus

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus torquatus
Lophocebus albigena (e?)
Mandrillus leucophaeus
Papio anubis
Cercopithecus preussi
Cercopithecus nictitans
Cercopithecus sclateri
Cercopithecus erythrogaster
Cercopithecus erythrotis
Cercopithecus mona
Cercopithecus pogonias
Cercopithecus aethiops
Erythrocebus patas

Subfamily Colobinae

Procolobus verus
Procolobus badius
Colobus vellerosus
Colobus guereza

Family Pongidae

Pan troglodytes
Gorilla gorilla

Equatorial Guinea

(includes Bioko; species only on Bioko designated 'B';
only on mainland designated 'M')

(28,000 km², 22-23 species)

Family Lorisidae

Subfamily Lorisinae

Arctocebus aureus (M)
Perodicticus potto (M)

Subfamily Galaginae

Galago alleni
Galagoides demidoff
 (*Galagoides thomasi?*) (M)
Euoticus elegantulus (M)
Euoticus pallidus (B)

Family Cercopithecidae**Subfamily Cercopithecinae**

Cercocebus torquatus (M)
Cercocebus galeritus (M)
Lophocebus albigena (M)
Mandrillus sphinx (M)
Mandrillus leucophaeus (B)
Cercopithecus neglectus (M)
Cercopithecus preussi (B)
Cercopithecus erythrotis (B)
Cercopithecus cephus (M)
Cercopithecus pogonias
Miopithecus sp. (M)

Subfamily Colobinae

Procolobus badius (B)
Colobus satanas

Family Pongidae

Pan troglodytes (M)
Gorilla gorilla (M)

Congo

(342,000 km², 22 species)

Family Lorisidae**Subfamily Lorisinae**

Arctocebus aureus
Perodicticus potto

Subfamily Galaginae

Galago alleni
Galagoides demidoff
Euoticus elegantulus

Family Cercopithecidae**Subfamily Cercopithecinae**

Cercocebus torquatus
Cercocebus galeritus
Lophocebus albigena
Papio anubis
Mandrillus sphinx
Cercopithecus neglectus
Cercopithecus nictitans
Cercopithecus cephus

Cercopithecus pogonias
Cercopithecus aethiops
Miopithecus sp.
Allenopithecus nigroviridis

Subfamily Colobinae

Procolobus badius
Colobus guereza
Colobus satanas

Family Pongidae

Pan troglodytes
Gorilla gorilla

Uganda

(236,000 km², 20 species)

Family Lorisidae**Subfamily Lorisinae**

Perodicticus potto

Subfamily Galaginae

Otolemur crassicaudatus
Galago matschiei
Galago senegalensis
Galagoides demidoff
Galagoides thomasi

Family Cercopithecidae**Subfamily Cercopithecinae**

Lophocebus albigena
Papio anubis
Cercopithecus neglectus
Cercopithecus lhoesti
Cercopithecus mitis
Cercopithecus ascanius
Cercopithecus wolffi
Cercopithecus aethiops
Erythrocebus patas

Subfamily Colobinae

Procolobus badius
Colobus guereza
Colobus angolensis

Family Pongidae

Pan troglodytes
Gorilla gorilla

Central African Republic

(623,000 km², 19-20 species)

Family Lorisidae

Subfamily Lorisinae

Arctocebus aureus?
Perodicticus potto

Subfamily Galaginae

Galago alleni
Galago senegalensis
Galagoides demidoff
Euoticus elegantulus

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus galeritus
Lophocebus albigena
Papio anubis
Cercopithecus neglectus
Cercopithecus nictitans
Cercopithecus cephus
Cercopithecus ascanius
(*C. cephus* x *C. ascanius* hybrids)
Cercopithecus pogonias
Cercopithecus aethiops
Erythrocebus patas

Subfamily Colobinae

Procolobus badius
Colobus guereza

Family Pongidae

Pan troglodytes
Gorilla gorilla

Gabon

(265,000 km², 19-20 species)

Family Lorisidae

Subfamily Lorisinae

Arctocebus aureus
Perodicticus potto

Subfamily Galaginae

Galago alleni
Galagoides demidoff
(*Galagoides thomasi?*)
Euoticus elegantulus

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus torquatus
Cercocebus galeritus
Lophocebus albigena
Mandrillus sphinx
Cercopithecus neglectus
*Cercopithecus solatus**
Cercopithecus nictitans
Cercopithecus cephus
Cercopithecus pogonias
Miopithecus sp.

Subfamily Colobinae

Colobus guereza
Colobus satanas

Family Pongidae

Pan troglodytes
Gorilla gorilla

Tanzania

(945,000 km², 18-19 species)

Family Lorisidae

Subfamily Galaginae

Otolemur crassicaudatus
Otolemur garnettii
Galago senegalensis
Galago moholi
Galago zanzibaricus
Galago sp. (*granti?*)
Other galagos?

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus galeritus
Papio anubis
Papio cynocephalus
Cercopithecus mitis
Cercopithecus albogularis
Cercopithecus ascanius
Cercopithecus aethiops
Erythrocebus patas

Subfamily Colobinae

Procolobus badius
Colobus guereza
Colobus angolensis

Family Pongidae

Pan troglodytes

Angola

including *Cabinda* (C)

(1,247,000 km², 18-21 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Otolemur crassicaudatus

(*Galago alleni?*) (C)

Galago moholi

Galagoides demidoff

Galagoides thomasi

(*Euoticus elegantulus*) (C)

Family Cercopithecidae

Subfamily Cercopithecinae

Lophocebus aterrimus

Papio cynocephalus

Papio ursinus

Cercopithecus neglectus

Cercopithecus mitis

Cercopithecus nictitans

Cercopithecus cephus

Cercopithecus ascanius

(*Cercopithecus pogonias?*) (C)

Cercopithecus wolffi

Cercopithecus aethiops

Miopithecus talapoin

Subfamily Colobinae

Colobus angolensis

Family Pongidae

Gorilla gorilla (C)

Kenya

(583,000 km², 18-19 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Otolemur crassicaudatus

Otolemur garnettii

Galago senegalensis

Galago gallarum

Galago zanzibaricus

(*Galagoides thomasi?*)

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus galeritus

Papio anubis

Papio cynocephalus

Cercopithecus neglectus

Cercopithecus albogularis

Cercopithecus mitis

Cercopithecus ascanius

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus badius

Colobus guereza

Colobus angolensis

Côte d'Ivoire

(322,000 km², 16 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Galago senegalensis

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys

Papio anubis

Cercopithecus diana

Cercopithecus nictitans

Cercopithecus petaurista

Cercopithecus campbelli

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus verus

Procolobus badius

Colobus polykomos

Colobus vellerosus

Family Pongidae

Pan troglodytes

Rwanda

26,000 km², 15-18 species

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Otolemur crassicaudatus

(*Galago matschiei?*)

Galago moholi

(*Galagoides demidoff?*)

(*Galagoides thomasi?*)

Family Cercopithecidae

Subfamily Cercopithecinae

Lophocebus albigena

Papio anubis

Cercopithecus hamlyni

Cercopithecus lhoesti

Cercopithecus mitis

Cercopithecus ascanius

Cercopithecus wolffi

Cercopithecus aethiops

Subfamily Colobinae

Colobus guereza

Colobus angolensis

Family Pongidae

Pan troglodytes

Gorilla gorilla

Ghana

(239,000 km², 15 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Galago senegalensis

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys

Papio anubis

Cercopithecus diana

Cercopithecus petaurista

Cercopithecus campbelli

Cercopithecus mona

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus verus

Procolobus badius

Colobus vellerosus

Family Pongidae

Pan troglodytes

Sierra Leone

(72,000 km², 15 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Galago senegalensis

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys

Papio papio

Papio anubis

Cercopithecus diana

Cercopithecus petaurista

Cercopithecus campbelli

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus verus

Procolobus badius

Colobus polykomos

Family Pongidae

Pan troglodytes

Guinea

(246,000 km², 14 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Galago senegalensis

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys
Papio papio
Papio anubis
Cercopithecus diana
Cercopithecus petaurista
Cercopithecus campbelli
Cercopithecus aethiops
Erythrocebus patas

Subfamily Colobinae

Procolobus badius
Colobus polykomos

Family Pongidae

Pan troglodytes

Liberia

(111,000 km², 12 species)

Family Lorisidae

Subfamily Lorissinae

Perodicticus potto

Subfamily Galaginae

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys
Cercopithecus diana
Cercopithecus nictitans
Cercopithecus petaurista
Cercopithecus campbelli
Cercopithecus aethiops

Subfamily Colobinae

Procolobus verus
Procolobus badius
Colobus polykomos

Family Pongidae

Pan troglodytes

Burundi

(28,000 km², 11-14 species)

Family Lorisidae

Subfamily Lorissinae

Perodicticus potto

Subfamily Galaginae

Otolemur crassicaudatus
(*Galago matschiei?*)
Galago moholi
(*Galagoides demidoff?*)
(*Galagoides thomasi?*)

Family Cercopithecidae

Subfamily Cercopithecinae

Lophocebus albigena
Papio anubis
Cercopithecus lhoesti
Cercopithecus mitis
Cercopithecus aethiops

Subfamily Colobinae

Procolobus badius
Colobus angolensis

Family Pongidae

Pan troglodytes

Sudan

(2,505,700 km², 11 species)

Family Lorisidae

Subfamily Galaginae

Galago senegalensis

Family Cercopithecidae

Subfamily Cercopithecinae

Lophocebus albigena
Papio anubis
Papio hamadryas
Cercopithecus neglectus
Cercopithecus mitis
Cercopithecus ascanius
Cercopithecus aethiops
Erythrocebus patas

Subfamily Colobinae

Colobus guereza

Family Pongidae

Pan troglodytes

Benin

(113,000 km², 10-11 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Galago senegalensis

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Papio anubis

Cercopithecus erythrogaster

Cercopithecus mona

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus verus

Colobus vellerosus

Family Pongidae

Pan troglodytes (e?)

Ethiopia

(1,222,000 km², 10-11 species)

Family Lorisidae

Subfamily Galaginae

Galago senegalensis

Galago gallarum

Family Cercopithecidae

Subfamily Cercopithecinae

Papio anubis

(*Papio cynocephalus*?)

Papio hamadryas

*Theropithecus gelada**

Cercopithecus neglectus

Cercopithecus mitis

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Colobus guereza

Guinea-Bissau

(36,000 km², 10-11 species)

Family Lorisidae

Subfamily Galaginae

Galago senegalensis

(*Galagoides demidoff*?)

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys

Papio papio

Cercopithecus petaurista

Cercopithecus campbelli

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus badius

Colobus polykomos

Family Pongidae

Pan troglodytes

Togo

(57,000 km², 9-11 species)

Family Lorisidae

Subfamily Lorisinae

Perodicticus potto

Subfamily Galaginae

Galago senegalensis

Galagoides demidoff

Family Cercopithecidae

Subfamily Cercopithecinae

Papio anubis

Cercopithecus petaurista

Cercopithecus mona

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus verus (e?)

Colobus vellerosus

Family Pongidae

Pan troglodytes (e?)

Zambia

(752,957 km², 9-10 species)

Family Lorisidae

Subfamily Lorisinae

(Perodicticus potto?)

Subfamily Galaginae

Otolemur crassicaudatus

Galago moholi

Family Cercopithecidae

Subfamily Cercopithecinae

Papio cynocephalus

Papio ursinus

Cercopithecus albogularis

Cercopithecus mitis

Cercopithecus ascanius

Cercopithecus aethiops

Subfamily Colobinae

Colobus angolensis

Senegal

(197,000 km², 8-11 species)

Family Lorisidae

Subfamily Galaginae

Galago senegalensis

(Galagoides demidoff?)

Family Cercopithecidae

Subfamily Cercopithecinae

Cercocebus atys

Papio papio

(Cercopithecus petaurista?)

Cercopithecus campbelli

Cercopithecus aethiops

Erythrocebus patas

Subfamily Colobinae

Procolobus badius

(Colobus polykomos?)

Family Pongidae

Pan troglodytes

Appendix 2

Distribution and Status of the Most Threatened African Primate Species

Considered here are species with a threat rating of 3 or 4 in Table 3, that is, species regarded as Vulnerable or Endangered. Also included are the most threatened forms of red colobus monkeys, several of which are regarded as distinct species in some classifications.

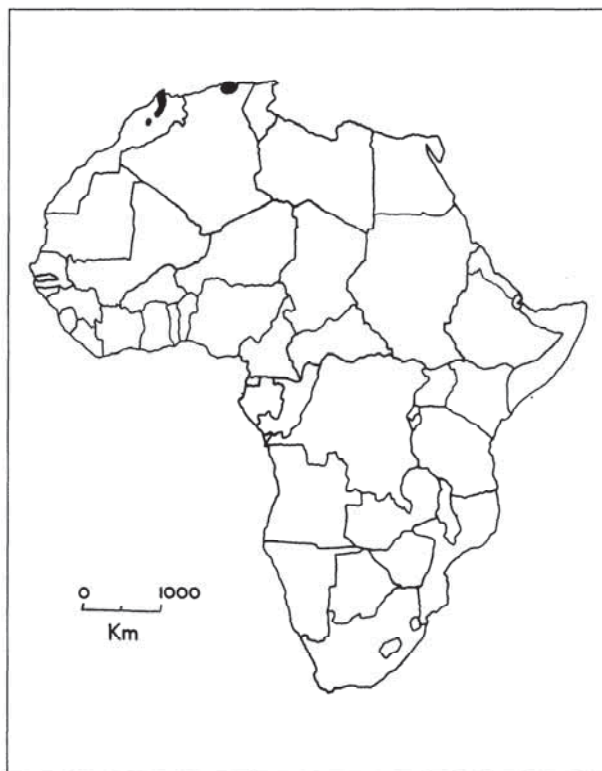
This is a revised version of the information that appeared in the first edition of the African primate action plan. The original information was provided by the IUCN Conservation Monitoring Centre, Cambridge, England, and it has been updated by J. Fa, A. Harcourt, J. Moore, G. Reinertz, T. Struhsaker, L. White and the compiler. The maps were drawn by Stephen Nash.

Barbary macaque (*Macaca sylvanus*)

Status: Once widespread throughout North Africa, it is now restricted to small patches of forest and scrub in northern Morocco and Algeria. A small feral population also occurs in Gibraltar. Population estimates vary between 9,000 and about 24,000, and 75% of the wild population occurs in the Middle Atlas, Morocco. It feeds eclectically and lives in multi-male groups which vary in size between areas. Numbers have declined dramatically in the past 50 years due mainly to habitat destruction. Even though populations occur in four National Parks in Algeria, these parks suffer from significant human impact. Remaining areas of macaque habitat require much stricter protection. The Barbary macaque breeds well in captivity and plans have been formulated to reintroduce surplus stock to areas where it occurred previously but is now extinct.

Drill (*Mandrillus leucophaeus*)

Status: The species is semi-terrestrial with a flexible social organization, small units occasionally joining to form groups of up to 200 animals. Distribution of the drill is still uncertain, but it appears to have a very restricted distribution in western Cameroon, southeastern Nigeria and Bioko Island (Equatorial Guinea). Numbers in Nigeria and Bioko have undoubtedly declined in recent years due to excessive hunting. Populations are theoretically protected within the Korup National Park, Cameroon, and the Cross River National Park, Nigeria, but hunting still occurs

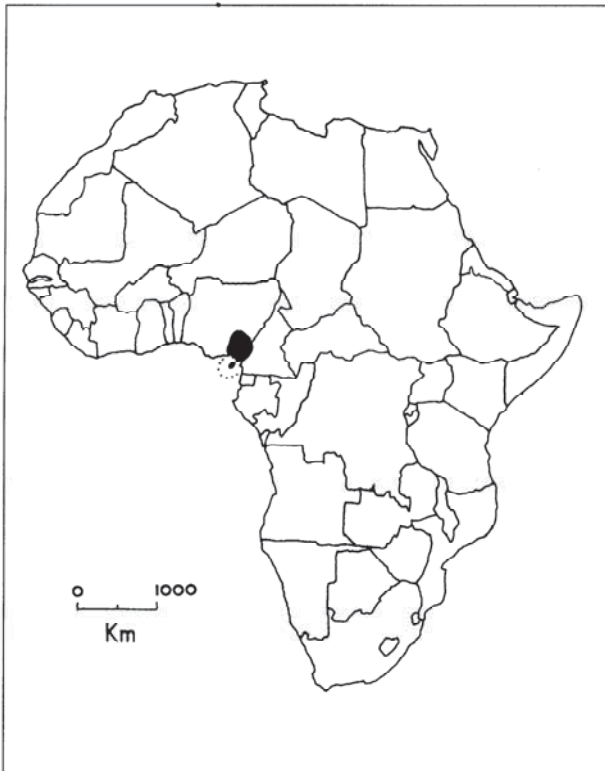


Distribution of Barbary macaque (*Macaca sylvanus*).

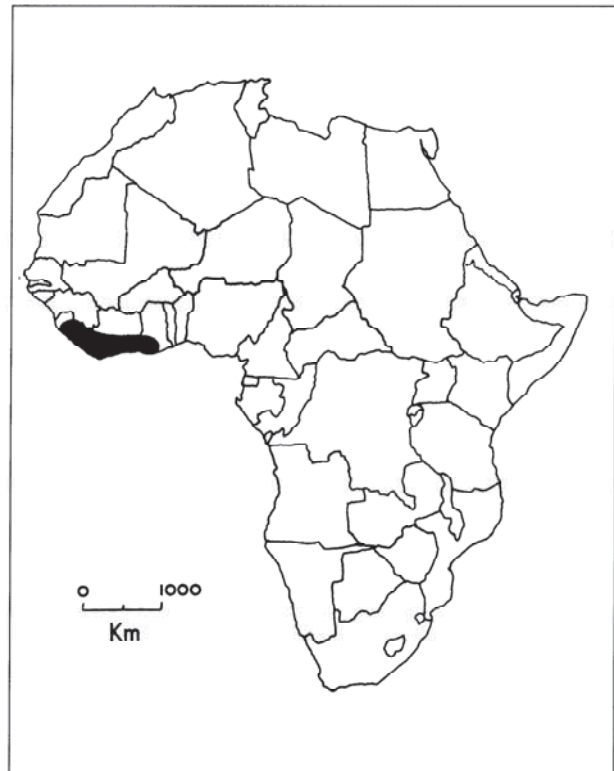
in these areas. On Bioko, the species is still found in good numbers in the southern part of the island, which is nominally a protected zone. In all areas, drills are threatened by loss of forest habitat as well as by hunting. Surveys are in progress, but need to be completed, to determine the distribution of viable populations in Cameroon outside Korup, and immediate protection is necessary in Bioko.

Diana monkey (*Cercopithecus diana*)

Status: Inhabits rain forest in Sierra Leone, Liberia, Côte d'Ivoire, Ghana, and the southern edge of Guinea. Two subspecies are recognized: *C. d. diana* west of the Sassandra river and *C. d. roloway* to the east. No comprehensive population survey has been made, but the



Distribution of drill (*Mandrillus leucophaeus*).



Distribution of Diana monkey (*Cercopithecus diana*).

Diana monkey appears to be one of the most vulnerable African primates. It is restricted to the wettest parts of the Upper Guinea forest zone; it is rare in degraded forest and is susceptible to hunting because of its relatively large body size, conspicuous coat pattern, loud vocalizations, and tendency to use the upper part of the forest canopy. Before the outbreak of the civil war in 1990, *C. d. diana* was still widespread in Liberia and relatively common in some areas of undisturbed forest with low hunting pressure. In Sierra Leone it was common at Tiwai Island, and it is also common in the large Tai National Park in western Côte d'Ivoire. *C. d. roloway* appears to be much more seriously threatened than *C. d. diana*; there are no recent reports of its status in eastern Côte d'Ivoire, and brief surveys in western Ghana have detected Roloway monkeys only in the contiguous Ankasa Reserve and Nini-Suhien National Park; more thorough surveys are urgently needed. Strictly protected areas of mature forest are needed to ensure the long-term survival of both subspecies.

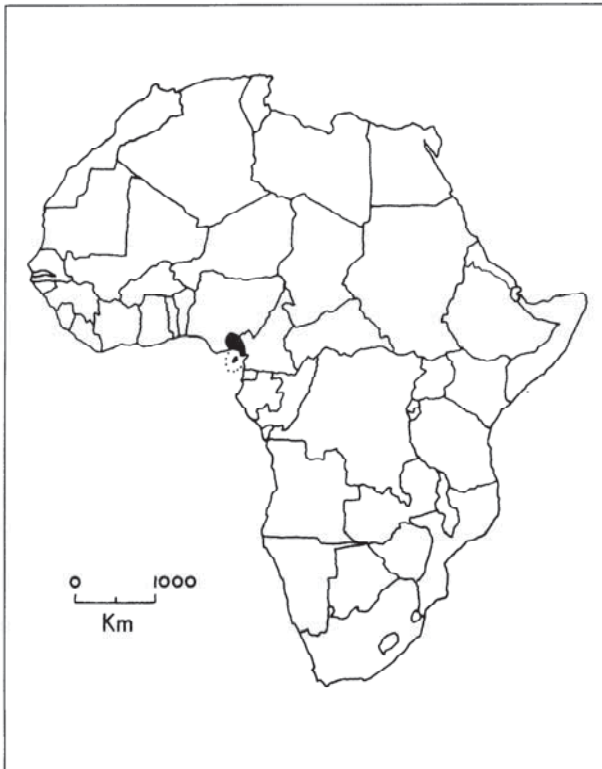
Preuss's guenon (*Cercopithecus preussi*)

Status: This is a close relative of *Cercopithecus lhoesti* and *C. solatus*. It has a very restricted distribution in W.

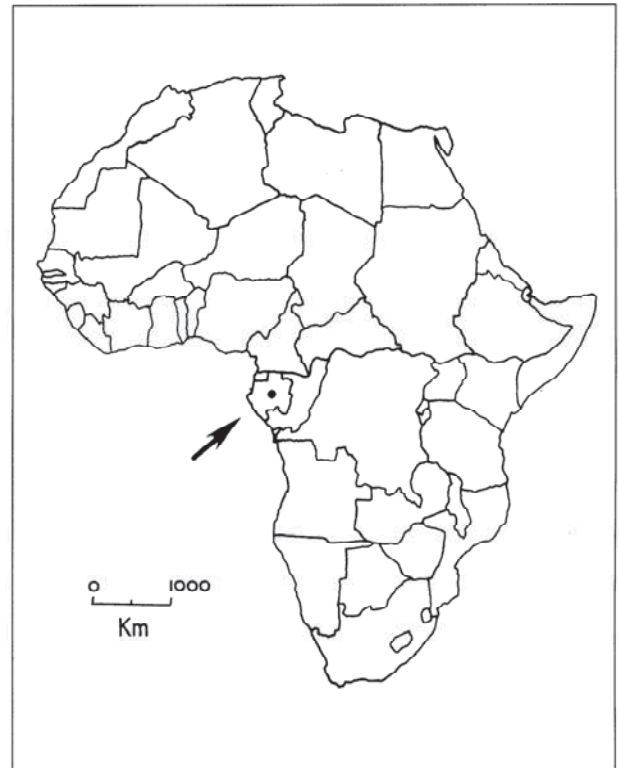
Cameroon, E. Nigeria and on the island of Bioko. It is most common in montane forest and rare in lowland forest. There has been no comprehensive population survey of Preuss's guenon, but it is believed to be seriously threatened over much of its range as a result of both habitat destruction (little montane forest now survives in the mainland part of its range) and hunting (it is semi-terrestrial and relatively large-bodied and therefore susceptible to human predation). The distinctiveness of the Bioko form (usually regarded as the subspecies *C. p. insularis*) requires clarification.

Sun-tailed guenon (*Cercopithecus solatus*)

Status: This monkey was discovered in the Fôret des Abeilles, Gabon, by M. Harrison in 1984. It is a close relative of *Cercopithecus lhoesti* and *C. preussi*. Subsequent surveys by Harrison and Gautier-Hion et al. suggested that the sun-tailed guenon was restricted to an area of about 5,000 km² in the Fôret des Abeilles, but in 1994 *C. solatus* was observed in southern parts of the Lopé Reserve, extending the species' known range about 2000 km² to the west. This is particularly significant because Lopé is relatively well-protected, while the Fôret des Abeilles has



Distribution of Preuss's guenon (*Cercopithecus preussi*).



Distribution of sun-tailed guenon (*Cercopithecus solatus*).

been opened up to timber exploitation. Timber exploitation is associated with increased hunting around logging camps and, being semi-terrestrial, *C. solatus* is sensitive to ground snares, a common form of hunting around logging camps. In response to this threat the Gabonese government declared the sun-tailed guenon a totally protected species in 1994. It is now important to establish more precisely the western limit of their distribution and to monitor closely planned logging operation in the south of the Lopé Reserve.

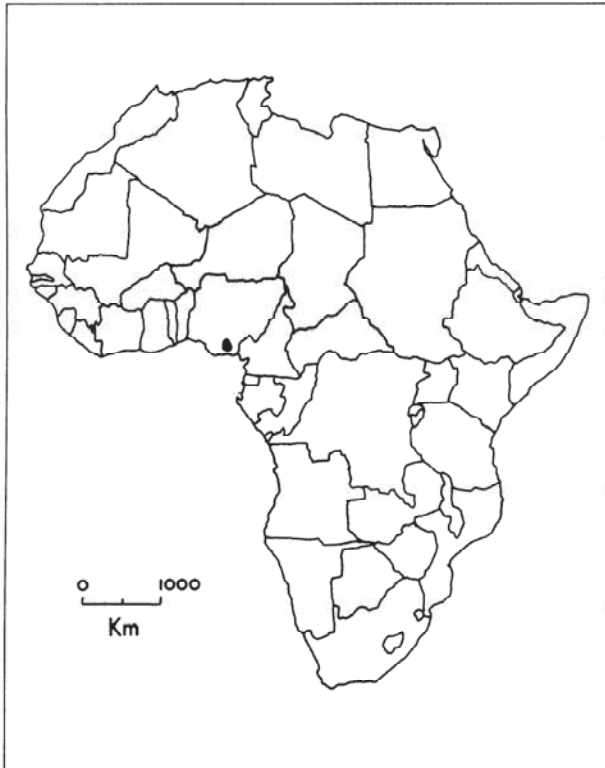
Sclater's guenon (*Cercopithecus sclateri*)

Status: Sclater's guenon has been regarded as a subspecies of *Cercopithecus erythrotis*, but appears to be a good species. It was feared to be extinct until populations were found surviving in eastern Nigeria in 1988. It occurs only between the Niger and Cross Rivers, an area with a very dense human population where most of the natural forest has been destroyed. Small, scattered populations survive in some patches of swamp and riverine forest, and in a few villages where they are regarded as sacred animals. Except in the very few places where they are held sacred, Sclater's guenons are heavily hunted in spite of

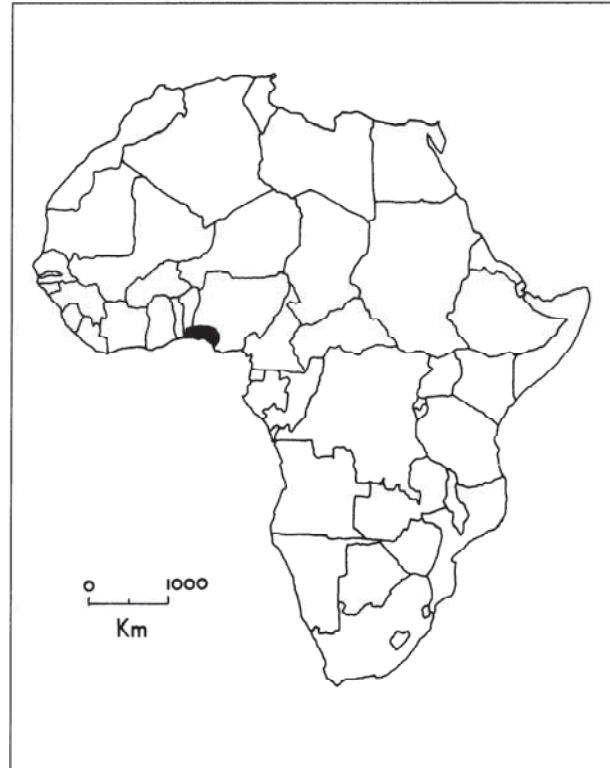
their small body size. Stringent protection of remaining populations is needed; one of these populations is in the Stubbs Creek Forest Reserve in Akwa Ibom State, where a conservation project designed particularly to protect this species has made little progress.

White-throated or red-bellied guenon (*Cercopithecus erythrogastrer*)

Status: Known only from southwestern Nigeria and southern Benin, where it is largely restricted to moist forest and the wettest parts of the dry forest zone. Natural forest is increasingly fragmented within the range of this species, which does not do well in very degraded forest. It is threatened not only because of its restricted range and the loss of its habitat, but also by hunting, which is intense in southern Nigeria. There is no reliable population estimate, but numbers must be declining. Two color phases are known; in one the venter is red, in the other grey. Red-bellied animals are definitely known only from Benin, where they have been observed in Lama Forest. Stringent habitat protection and hunting restrictions are needed, and further data on status and ecology are required.



Distribution of Sclater's guenon (*Cercopithecus sclateri*).



Distribution of white-throated or red-bellied guenon (*Cercopithecus erythrogaster*).

White-thighed black-and-white colobus (*Colobus vellerosus*)

Status: Historically, this colobus occurred in central and eastern Côte d'Ivoire, Ghana, Togo, Benin and western Nigeria. The human population in this region is dense and growing very rapidly; forest destruction and fragmentation have been extensive, and the hunting of wildlife uncontrolled in most places. There has been no systematic survey of *C. vellerosus* populations, but it is known to have become rare in several national parks in Ghana where it had been assumed to be secure. Conservation needs are for a thorough survey, and more rigorous protection of remaining populations.

Black colobus (*Colobus satanas*)

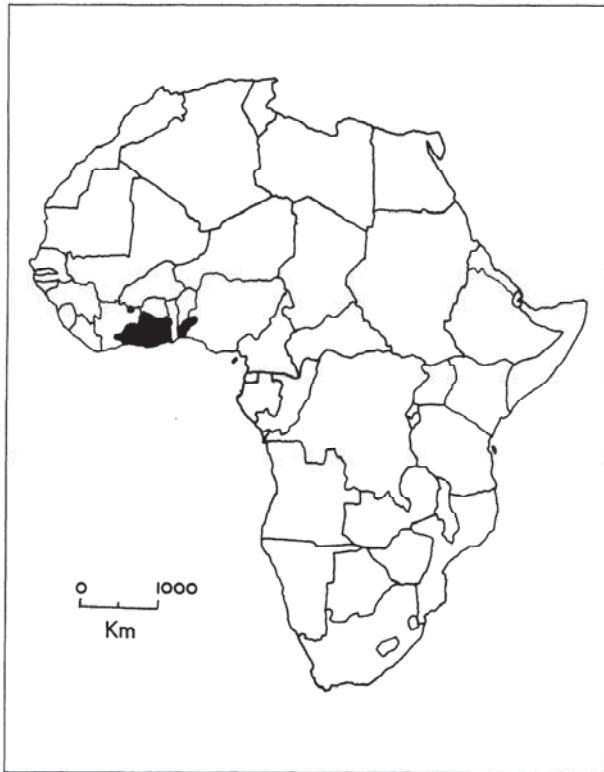
Status: Restricted to rain forest in Cameroon (south of the Sanaga River), Gabon, parts of Congo, and Equatorial Guinea (both mainland Rio Muni and the island of Bioko). Numbers are declining because of both hunting and habitat destruction; this species appears more sensitive to habitat disturbance than other members of the black-and-white colobus group and is rare or absent in secondary forests.

However, a large population survives in Gabon's Lopé Reserve, where the population is estimated to be at least 50,000 monkeys. More information is needed on its status in Congo.

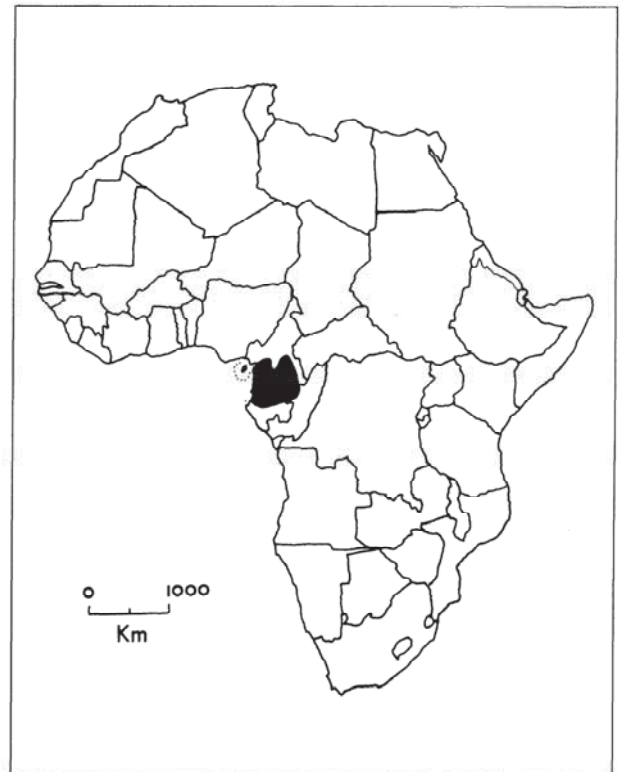
Red colobus (*Procolobus badius*)

Red colobus populations have a patchy distribution from Senegal to Zanzibar. Between 14 and 17 subspecies are recognized and several of these are so distinctive (e.g., Zanzibar red colobus) that some classifications regard them as full species. Few populations are secure and the following eight local forms are considered to be especially threatened:

Procolobus badius waldroni. Miss Waldron's red colobus is known only from eastern Côte d'Ivoire and western Ghana in high forest. None were seen during recent surveys of forests in Ghana, including Bia National Park, where it was formerly relatively common. Habitat destruction and hunting of forest wildlife have been intense within the range of this monkey and it appears to be on the verge of extinction.



Distribution of white-thighed black-and-white colobus (*Colobus vellerosus*).



Distribution of black colobus (*Colobus satanas*).

Procolobus badius epieni. This form was discovered in 1993 in the central delta of the Niger in southern Nigeria. It is most similar to *pennantii* of Bioko. There is no population estimate for the Niger Delta red colobus; its swamp forest habitat is coming under increasing pressure from oil extraction activities and logging, and it is also hunted for its meat. There is no protected area within its range; one needs to be established as a matter of urgency.

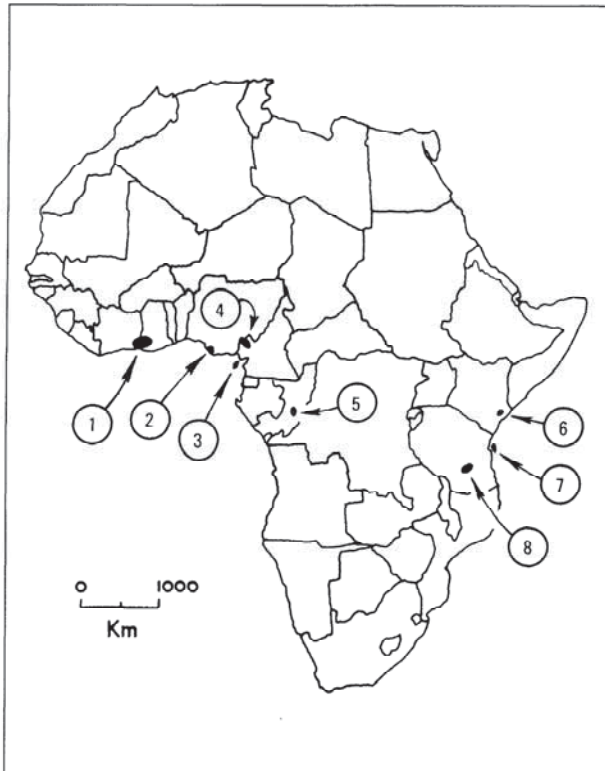
Procolobus badius pennantii. Pennant's red colobus is endemic to Bioko. Recent surveys have found it only in the southwestern part of the island, but it may also occur on Pico Basilé. It inhabits the most remote, primary forest and has been much affected by hunting and habitat loss. Probably fewer than 10,000 individuals survive. A rigorous protection program is needed.

Procolobus badius preussi. Preuss's red colobus has a very restricted range in the lowland evergreen forest of western Cameroon and possibly far southeastern Nigeria. The only confirmed population is in the Korup National Park, where the total number is probably in the range 10-15,000. Despite Korup's protected status, colobus are still hunted at a level exceeding sustainability.

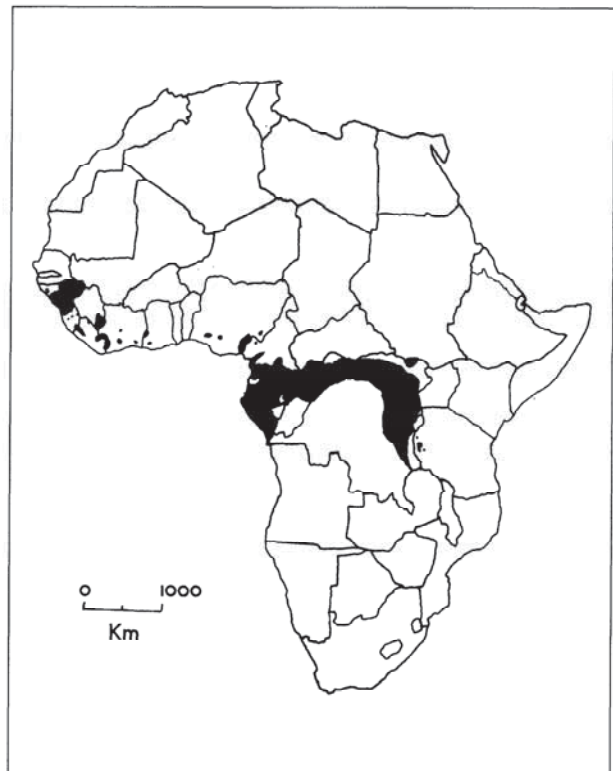
Procolobus badius bouvieri. Bouvier's red colobus is endemic to Congo. There is no recent information on its status. Reports of its occurrence in the Lefini Reserve may be incorrect. Surveys of its distribution and status are needed extremely urgently and immediate protection from hunting and other forms of disturbance is required.

*Procolobus badius rufomitratu*s. The Tana River red colobus is confined to the remnant gallery forests of the lower Tana River in Kenya. Recent surveys indicate at least 86 groups occur in 34 forest patches. The total population is estimated at 1,100-1,300, down from an estimated 1,200-1,800 in 1975. About 40% of the population occurs within the Tana Primate National Reserve. All remaining forest patches inhabited by colobus are small and this, combined with the separation of the patches, makes the population highly vulnerable. The forest patches are seriously threatened by conversion to farmland, by burning, and by reduced river discharge and silt deposition resulting from several dams and irrigation projects up-river. Stringent habitat protection is required.

Procolobus badius kirkii. The Zanzibar red colobus is found only on Zanzibar Island off the Tanzania coast,



Distribution of the most threatened subspecies of the red colobus (*Procolobus badius*). 1 = *waldroni*; 2 = *epieni*; 3 = *pennantii*; 4 = *preussi*; 5 = *bouvieri*; 6 = *rufomitratus*; 7 = *kirkii*; 8 = *gordonorum*.



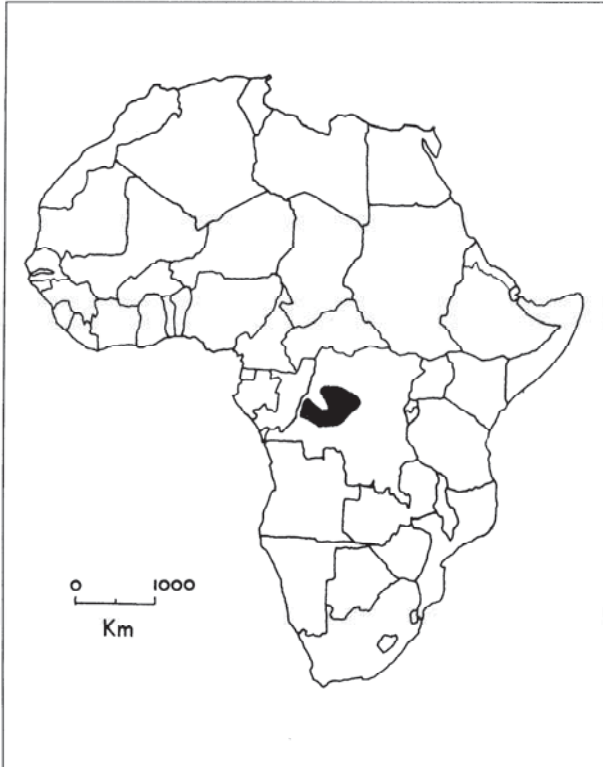
Distribution of the chimpanzee (*Pan troglodytes*).

where it only occurs at relatively high densities in and adjacent to the Jozani Forest Reserve in the south. The monkey lives in relatively large, multi-male groups in overlapping home ranges. An estimated 1,000-1,500 remain, and they are severely threatened by habitat destruction. No populations are currently protected effectively; Jozani Forest Reserve and other remaining areas of habitat require full legal and practical protection if this unique colobus is to be saved.

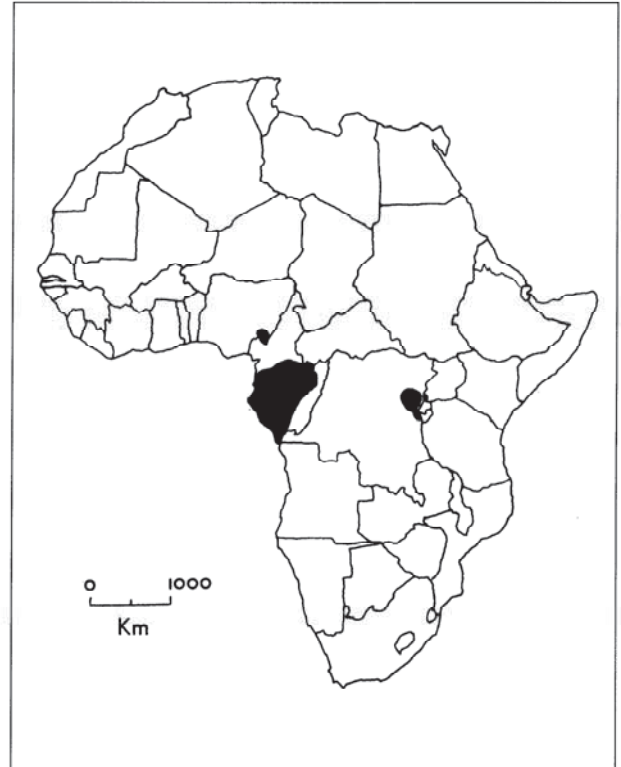
Procolobus badius gordonorum. The Uhehe red colobus is endemic to Tanzania where it has a scattered and very restricted distribution in forests in and around the Udzungwa (=Uzungwa) Mountains and Magombera Forest Reserve. It is extremely rare, and threatened by habitat loss and hunting, but there are no reliable estimates of its numbers. The largest population lives in the newly created Udzungwa National Park. Half of the tiny Magombera Forest has been totally destroyed by agricultural encroachment during the past 15 years, leaving only 6 km² for wildlife; approximately 450 red colobus live in this forest patch. A full population survey and assessment of conservation requirements are needed.

Chimpanzee (*Pan troglodytes*)

Status: Chimpanzees are divided into three widely-recognized subspecies: eastern *P. t. schweinfurthi* between Tanzania and Zaire (north and east of the Zaire River), central *P. t. troglodytes* between Zaire and Nigeria, and western *P. t. verus* between Nigeria (or Togo) and Senegal. There is little survey data over much of this range, rendering population estimates crude. Approximately 8,000 eastern chimpanzees are estimated to occur outside Zaire (with ca. 5,000 in Uganda); Zaire may have 5,000+ and surveys are needed. Protection in Tanzania and Uganda at least is relatively good, though limited poaching has been reported and habitat loss to agriculture remains a perennial pressure. Central chimpanzees are the most numerous, with perhaps 80,000 found chiefly in Gabon and Congo. They are threatened by habitat loss and hunting for meat and traditional medicine. Finally, western *P. t. verus* are patchily distributed and may number no more than 12,000, with very few in protected areas; they are severely threatened by habitat loss, hunting, and (in the recent past) by biomedical trade; this subspecies is therefore severely threatened. The eastern range boundary of



Distribution of the bonobo (*Pan paniscus*).



Distribution of the gorilla (*Gorilla gorilla*).

verus is unclear. Genetic evidence suggests that *verus* may have diverged from central and eastern chimpanzees some 1.6 million years ago; whether or not this merits taxonomic revision, from a conservation standpoint *P. t. verus* should probably be viewed as an independent evolutionary unit.

Bonobo (*Pan paniscus*)

Status: The bonobo has a discontinuous range in the Central Zaire Basin of Equatorial Africa, south of the Zaire and east of the Lomami Rivers. Although the extent of potential habitat is estimated to be approximately 840,000 km² (using the historical eastern boundary—the Lualaba), the bonobo is thought to occur in only small isolated populations within this range. There are no substantive data concerning total numbers, and all estimates are speculative. However, because of the rapid decline in some study populations and the disappearance of bonobos from populations where they were once common, investigators estimate fewer than 25,000 and more likely 10,000 to 20,000. Only a few populations may be considered self-sustaining. Habitat destruction from commercial logging and agriculture, traditional slash-and-burn agriculture, and encroach-

ment by growing human populations are the primary threats to the species. Bonobos are hunted in parts of their range for food, and in other parts local taboos against hunting are disintegrating due to changing cultural values associated with more transient human populations. Although the bonobo is protected by Zairean law, enforcement is negligible, and conservation efforts are hampered by sustained political and economic instability. The most urgent conservation requirement, therefore, is to establish parks and reserves in areas with viable bonobo populations and undegraded habitat. Surveys are also urgently needed to determine more fully the species' distribution and abundance. Conservation education programs are needed to help curb poaching and illegal trade. The bonobo breeds in captivity, and captive propagation programs exist for North American and European zoos. An *Action Plan for Pan paniscus* has been published (Thompson-Handler *et al.*, 1995).

Gorilla (*Gorilla gorilla*)

Status: Gorillas occur in two regions of Africa, equatorial west Africa and east central Africa. Three subspecies are

usually recognized: The western lowland gorilla (*G. g. gorilla*) still occurs in Cameroon, Central African Republic, Congo, Equatorial Guinea, Gabon, and as a relict population in southeastern Nigeria; the eastern lowland gorilla (*G. g. graueri*) occurs in eastern Zaire; and the mountain gorilla (*G. g. beringei*) occurs in two populations in Rwanda, Uganda and Zaire. Precise counts come from only a few small populations, but recent calculations of estimated densities by area of suitable habitat

indicate a stable population of about 600 *G. g. beringei*, all of them in National Parks; a declining population of at least 10,000 *G. g. graueri*, about half in National Parks; and more than 110,000 *G. g. gorilla*, less than 10% of which are in National Parks. *G. g. gorilla*'s numbers are likely to crash within a century, until they occur only in conservation areas. Hunting, and forest clearance for agriculture and timber are the main threats, and they are increasing in intensity and extent.

IUCN/SSC Action Plans for the Conservation of Biological Diversity

- Action Plan for African Primate Conservation: 1986-1990.* Compiled by J.F. Oates and the IUCN/SSC Primate Specialist Group, 1986, 41 pp. (Out of print.)
- Action Plan for Asian Primate Conservation: 1987-1991.* Compiled by A.A. Eudey and the IUCN/SSC Primate Specialist Group, 1987, 65 pp. (Out of print.)
- Antelopes. Global Survey and Regional Action Plans. Part 1. East and Northeast Africa.* Compiled by R. East and the IUCN/SSC Antelope Specialist Group, 1988, 96 pp. (Out of print.)
- Dolphins, Porpoises and Whales. An Action Plan for the Conservation of Biological Diversity: 1988-1992.* Second Edition. Compiled by W.F. Perrin and the IUCN/SSC Cetacean Specialist Group, 1989, 27 pp. (Out of print.)
- The Kouprey. An Action Plan for its Conservation.* Compiled by J.R. MacKinnon, S.N. Stuart and the IUCN/SSC Asian Wild Cattle Specialist Group, 1988, 19 pp. (Out of print.)
- Weasels, Civets, Mongooses and their Relatives. An Action Plan for the Conservation of Mustelids and Viverrids.* Compiled by A. Schreiber, R. Wirth, M. Riffel, H. van Rompaey and the IUCN/SSC Mustelid and Viverrid Specialist Group, 1989, 99 pp. (Out of print.)
- Antelopes. Global Survey and Regional Action Plans. Part 2. Southern and South-central Africa.* Compiled by R. East and the IUCN/SSC Antelope Specialist Group, 1989, 96 pp. (Out of print.)
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- The Asian Elephant. An Action Plan for its Conservation.* Compiled by C. Santiapillai, P. Jackson, and the IUCN/SSC Asian Elephant Specialist Group, 1990, 79 pp.
- Antelopes. Global Survey and Regional Action Plans. Part 3. West and Central Africa.* Compiled by R. East and the IUCN/SSC Antelope Specialist Group, 1990, 171 pp.
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- Pigs, Peccaries, and Hippos. Status Survey and Conservation Action Plan.* Edited by William L.R. Oliver and the IUCN/SSC Pigs and Peccaries Specialist Group and the IUCN/SSC Hippo Specialist Group, 1993, 202 pp.
- The Red Panda, Olingos, Coatis, Raccoons, and their Relatives. Status Survey and Conservation Action Plan for Procyonids and Ailurids.* (In English and Spanish) Compiled by Angela R Glatston and the IUCN/SSC Mustelid, Viverrid, and Procyonid Specialist Group, 1994, 103 pp.
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- Partridges, Quails, Francolins, Snowcocks, and Guineafowl. Status Survey and Conservation Action Plan: 1995-1999.* Compiled by Philip J.K. McGowan, Simon D. Dowell, John P. Carroll, Nicholas J.A. Aebischer, and the WPA/BirdLife/SSC Partridge, Quail, and Francolin Specialist Group, 1995, 102 pp.
- Pheasants. Status Survey and Conservation Action Plan: 1995-1999.* Compiled by Philip J.K. McGowan and Peter J. Garson on behalf of the WPA/BirdLife/SSC Pheasant Specialist Group, 1995, 116 pp.
- Wild Cats. Status Survey and Conservation Action Plan.* Compiled and edited by Kristin Nowell, Peter Jackson, and the IUCN/SSC Cat Specialist Group, 1996, 406 pp.

IUCN/Species Survival Commission

The Species Survival Commission (SSC) is one of six volunteer commissions of IUCN—The World Conservation Union, a union of sovereign states, government agencies and non-governmental organizations. IUCN has three basic conservation objectives: to secure the conservation of nature, and especially of biological diversity, as an essential foundation for the future; to ensure that where the earth's natural resources are used this is done in a wise, equitable and sustainable way; and to guide the development of human communities towards ways of life that are both of good quality and in enduring harmony with other components of the biosphere.

The SSC's mission is to conserve biological diversity by developing and executing programs to save, restore and wisely manage species and their habitats. A volunteer network comprised of nearly 7,000 scientists, field researchers, government officials and conservation leaders from 188 countries, the SSC membership is an unmatched source of information about biological diversity and its conservation. As such, SSC members provide technical and scientific counsel for conservation projects throughout the world and serve as resources to governments, international conventions and conservation organizations.

The IUCN/SSC Action Plan series assesses the conservation status of species and their habitats, and specifies conservation priorities. The series is one of the world's most authoritative sources of species conservation information available to nature resource managers, conservationists and government officials around the world.

