

## CHAPTER 7 Conclusions and Recommendations

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## CHAPTER 7

### Conclusions and Recommendations



Logs of felled swamp forest trees awaiting transport to Lagos in a creek in the Niger Delta, Nigeria.

Our findings underscore the global significance of this biodiversity hotspot and provide solid evidence of the extreme threat it is under. Nonetheless, additional basic inventory surveys are needed to assess relatively neglected areas in Nigeria (e.g., the Niger Delta, the Oban Hills, and the Sankwala Mountains) and in Cameroon (e.g., the Rumpi Hills, the Bakossi Mountains, the Mone River Forest Reserve, and the Ebo forest to the southeast of Yabassi). Small mammals, lizards, freshwater fish, and most invertebrates (other than butterflies) are among the most neglected taxonomic groups. In addition, long-term ecological monitoring programs are needed in the region, efforts that could be launched by establishing a series of modest field stations, which could be used in the training of local scientists.

Among the many threatened taxa in the region, the status of Preuss's red colobus is particularly poorly known. Hunting is believed to be the cause of the significant decline of these animals as well as the decline of populations of most of the region's larger mammals. However, little quantitative data are available on the scope and scale of this hunting and its associated bushmeat trade, nor on the precise impact of hunting on wildlife populations. The threatened status of smaller vertebrates and plants in this region also needs to be more thoroughly analyzed and better understood. Many amphibians, for instance, have highly restricted ranges in montane areas that are poorly protected, yet these species appear to have been neglected in IUCN listings.

The coverage and functionality of protected areas in the region need to be improved. The existing protected areas, although relatively small, provide relatively good coverage of the major lowland forest block on the Nigeria-Cameroon border (particularly in Oban-Korup). However, the recommended boundaries of the Oban Division of Cross River National Park are not yet gazetted, and the parks have not yet gained control of bushmeat hunting, other than in localized areas. In addition, other lowland forest areas need to be brought under protection, especially in places such as the Niger Delta, which have a different fauna and flora from the Nigeria-Cameroon border area. Montane forest in the region, home to a very large number of endemic taxa, is very poorly protected and under great threat. Among montane areas that need to be given greater legal protection are the Obudu Plateau, Mount Cameroon, Mount Kupé, and Mount Manengouba.

Simply adding new protected areas to the existing system in the region will not solve all its conservation problems, however. For example, a set of protected forest patches will not conserve the largest mammals in the region. These mammals are particularly threatened not only because they are targeted by hunters, but also because they live at low densities and use large areas of habitat. For large forest mammals such as elephants, gorillas, and chimpanzees, we need to investigate the possibility of establishing conservation corridors that connect core protected areas. This is particularly critical in the case of the Cross River gorilla, unique to this region and now reduced to a fragmented population of less than 300 individuals. One way to facilitate such comprehensive conservation planning would be to hold a conservation planning workshop for this region. Such a workshop should bring together experts on different taxonomic groups, ecologists familiar with these systems, non-governmental conservationists, and conservation managers from government, to set priorities for conservation action.

Finally, expanding the scope of research in the area would help to more fully realize the value of quite large datasets combined in a GIS. For instance, much could be learned by more carefully examining the extent to which there is congruence in the distribution of endemic and/or endangered species belonging to different taxonomic groups. In turn, knowing of such congruence could aid in the selection of priority areas for conservation attention, and might allow the use of a few species as indicators for biodiversity more generally. Better knowledge of the patterns of biological communities in the region would be similarly useful. For example, a lowland-montane forest dichotomy oversimplifies the complexity of the real patterns in this area, which appears to

have some unique middle-altitude (submontane) communities with their own endemic species, as well as south-north variation on a rainfall gradient, and west-east variation influenced by river barriers. These patterns need to be clarified if a fully representative set of protected areas is to be established.

Further analyses and planning would be aided by the acquisition of better-quality data on the relief and vegetation of this region. In the course of our research we found that some widely-used digital global databases (for instance, for land cover and relief) are quite inaccurate, at least at the scale of our analysis.

## RESEARCH RECOMMENDATIONS

Our analysis shows that a number of specific lines of research are needed to improve conservation in the Gulf of Guinea forests:

### Recommendation 1: Focus new field inventories at poorly-known sites.

Additional field inventories of biodiversity are needed throughout the Gulf of Guinea forests, followed by taxonomic study of the material collected. Among the many poorly known sites are the Niger Delta (where initial survey work on just a few taxonomic groups [Powell 1995, 1997] has turned up many species and subspecies that are either entirely new to science or not previously known from this area) and the Oban Division of Cross River National Park. Our maps show few records of regional endemics from the central Oban Hills. Yet large segments of the Hills have elevations above 500 m, with some areas reaching 1,000 m, which leads us to suspect that the low number of recorded regional endemics is due to a lack of biological exploration. Indeed, Torben Larsen's research on the extremely rich butterfly fauna of the Oban Hills (at least 775 species have been recorded and 1,000 are predicted to be present) suggests that the flora and fauna as a whole are much richer than has been estimated, and that much remains to be discovered. Elsewhere in Nigeria, the biologically unexplored Sankwala Mountains that lie southeast of the town of Obudu, north of the Okwangwo section of Cross River National Park and northwest of the Obudu Plateau, are a potentially rich research site because the mountains rise to elevations of 1,800 m. Little-studied sites in Cameroon include the Rumpi Hills and Bakossi Mountains, which each have elevations of 1,700 m in places, and the Mone River Forest Reserve. The Ebo Forest on the hills southeast of Yabassi also need a more thorough survey, particularly to check on a recent report that Preuss's red colobus monkey may survive there.

### Recommendation 2: Give priority to surveys of neglected animal groups in certain areas.

Small mammals are particularly poorly known in the Gulf of Guinea forests—several new species have recently been discovered based on collecting at just a few sites (Dieterlin & Van der Straeten 1992, Hutterer & Schlitter 1996, Verheyen *et al.* 1997), suggesting that much remains to be learned about this group in the region. Most bird observations carried out on the Nigerian side of the border have focused on the Obudu Plateau. Conse-

quently, more careful surveys are needed in the Oban Hills. The same is true for amphibians. Lizards appear to be yet another poorly sampled group in the region, although we have still not carefully researched their diversity and distribution. Similarly, while one study of freshwater fish from Korup has been published, virtually nothing appears to have been published on the fish fauna of Oban.

### **Recommendation 3: Launch ecological investigations and monitoring on a broad scale in the Gulf of Guinea forests.**

The Wildlife Conservation Society operated a research station in Korup from 1989 to 1993 and then shifted its research operations to Banyang-Mbo. However, the Society's research in Banyang-Mbo has focused mostly on species inventories rather than monitoring. An ongoing ecological study of gorillas, begun in 1986, is taking place at Afi Mountain. The study has a monitoring component that includes tree phenology. In 2003 a similar gorilla monitoring project began at Kagwene in Cameroon. The Smithsonian Institution has established tree-monitoring plots in Korup, although it is not clear how carefully these are being studied. Within the Mount Cameroon project, hunters' associations are primarily the ones charged with monitoring primate populations. More independent, scientific monitoring is therefore needed on Mount Cameroon. On Bioko, censuses of primates and other larger mammals in the Gran Caldera de Luba are conducted once a year, but long-term ecological research on other organisms, including plants, is needed. Several small field stations should be established throughout the Gulf of Guinea forests to act as bases for long-term ecological research and monitoring.

### **Recommendation 4: Conduct more extensive research on the population status and numerical trends of threatened primates in the region.**

Despite the attention some researchers have devoted to threatened primates in the Gulf of Guinea forests, the population status and numerical trends of most primate species in the region are still very poorly known. Our own observations in Cross River and Korup National Parks suggest that Preuss's red colobus may have been reduced to perilously low numbers. These observations have been corroborated by other researchers who recorded this species only three times in a recent extended survey of the Korup project area outside the park (Waltert *et al.* 2002). The drill appears to have been heavily impacted by bushmeat hunting, although no reliable population figures are available for this species. As for the Cross River gorilla, surveys in 2000–2002 revealed new locality records for this subspecies in Cameroon, although these studies also highlighted the extremely fragmented distribution of this critically endangered primate (Oates *et al.* 2003). A population viability analysis is thus a priority for the Cross River gorilla, with an examination of options for maintaining or encouraging connections between isolated populations; such an analysis was initiated by Bergl in 2003.

### **Recommendation 5: Expand knowledge of the impact of the bushmeat trade on wild animal populations in the Gulf of Guinea forests.**

Until recently, the only available studies on the bushmeat trade in the Gulf of Guinea forests were those by J. Fa and colleagues in the Malabo market (Fa *et al.* 1995, 2000) and by M. Infield in and around Korup (Infield 1988). New market data are now being analyzed from a project directed by Fa focusing on bushmeat in both Cameroon and Nigeria. However, better information is still badly needed on the locations, methods, and extent of bushmeat hunting as well as its impact on different species.

## **CONSERVATION RECOMMENDATIONS**

With regard to the conservation needs of the Gulf of Guinea forests, we recommend specific improvements to the region's existing network of protected areas as well as actions to address several gaps in the network of protected areas that were revealed by our analysis.

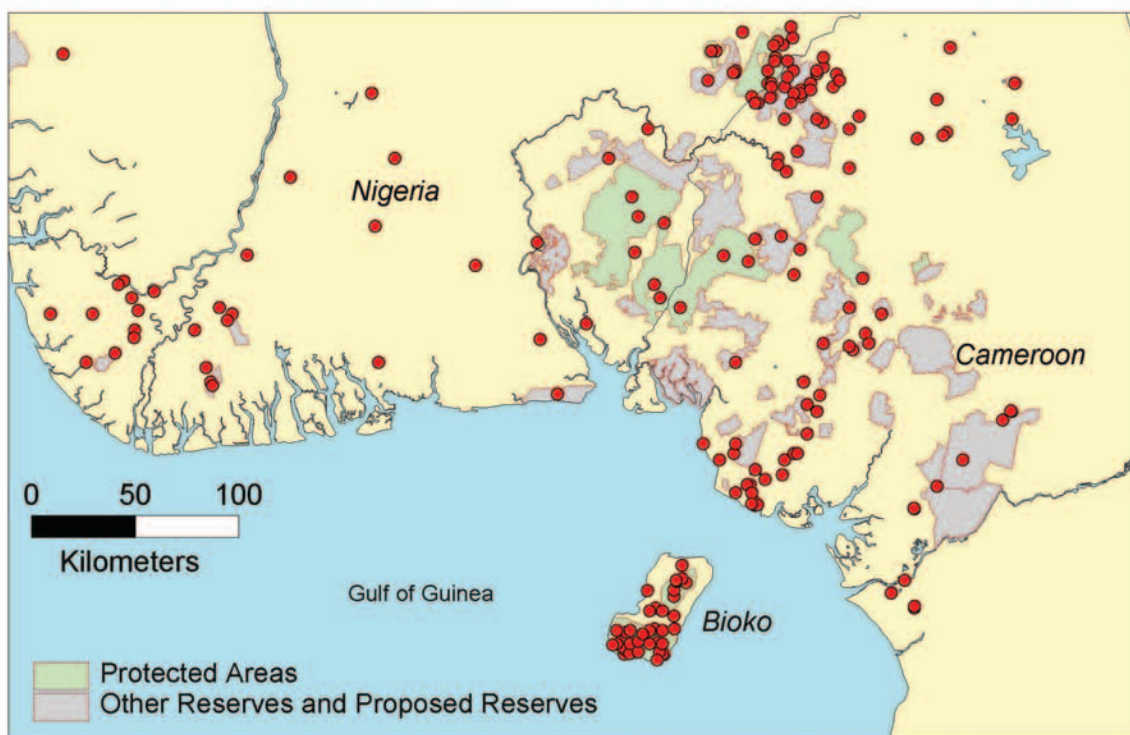
### **Recommendation 6: Improve law enforcement within existing protected areas.**

While protected areas in the Gulf of Guinea forests currently do a reasonably good job of conserving certain habitats, they have generally not been successful in protecting larger animals from hunting. A broad analysis of African rain forest park management by Struhsaker (2001) concluded that the most important short-term measure needed to improve the conservation status of wildlife in these parks is better law enforcement. Struhsaker's recommendation definitely applies to the two key protected areas discussed in this report: Cross River National Park and Korup National Park.

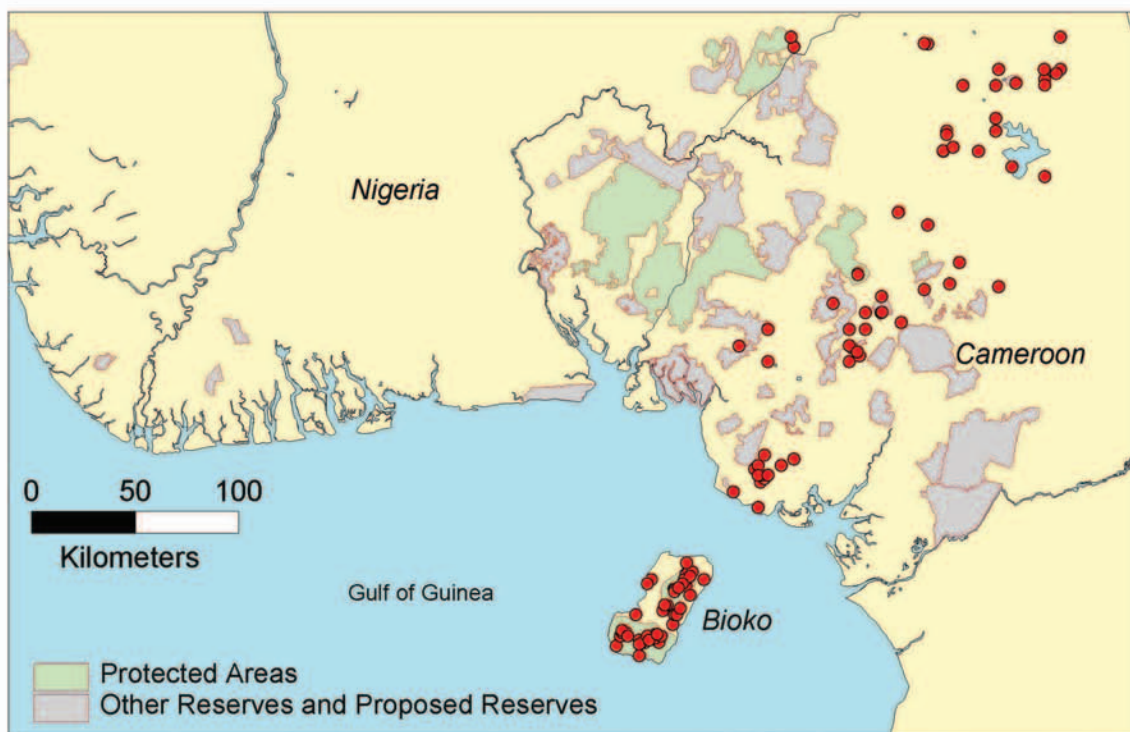
### **Recommendation 7: Increase investments in existing protected areas.**

Put simply, more funding is needed for protected area management in the Gulf of Guinea forests. In large part, increased investments in both the short and long terms will probably need to come from overseas. Trust funds and similar mechanisms should be explored as sources of secure funding. However, while local people need to be involved in management, it is not advisable to pursue this through development projects because such projects tend to increase pressure on park resources and draw attention away from conservation. Moreover, devolving most of the responsibility for protected area management to local communities, as is being suggested in many instances in Cameroon, would likely prove to be ineffective. Local communities in developing countries rarely have the capacity to manage protected areas and, compared to national governments, they tend to give more weight to maximizing short-term material gains than to protecting nature for the benefit of future generations (Oates 1999, Terborgh 1999).





(a)



(b)

Figure 23. Distributions of endemic (a) primates, (b) birds, and (c) anuran amphibians relative to existing protected areas and other reserves or proposed reserves in the study region. Figure continues on p. 85.

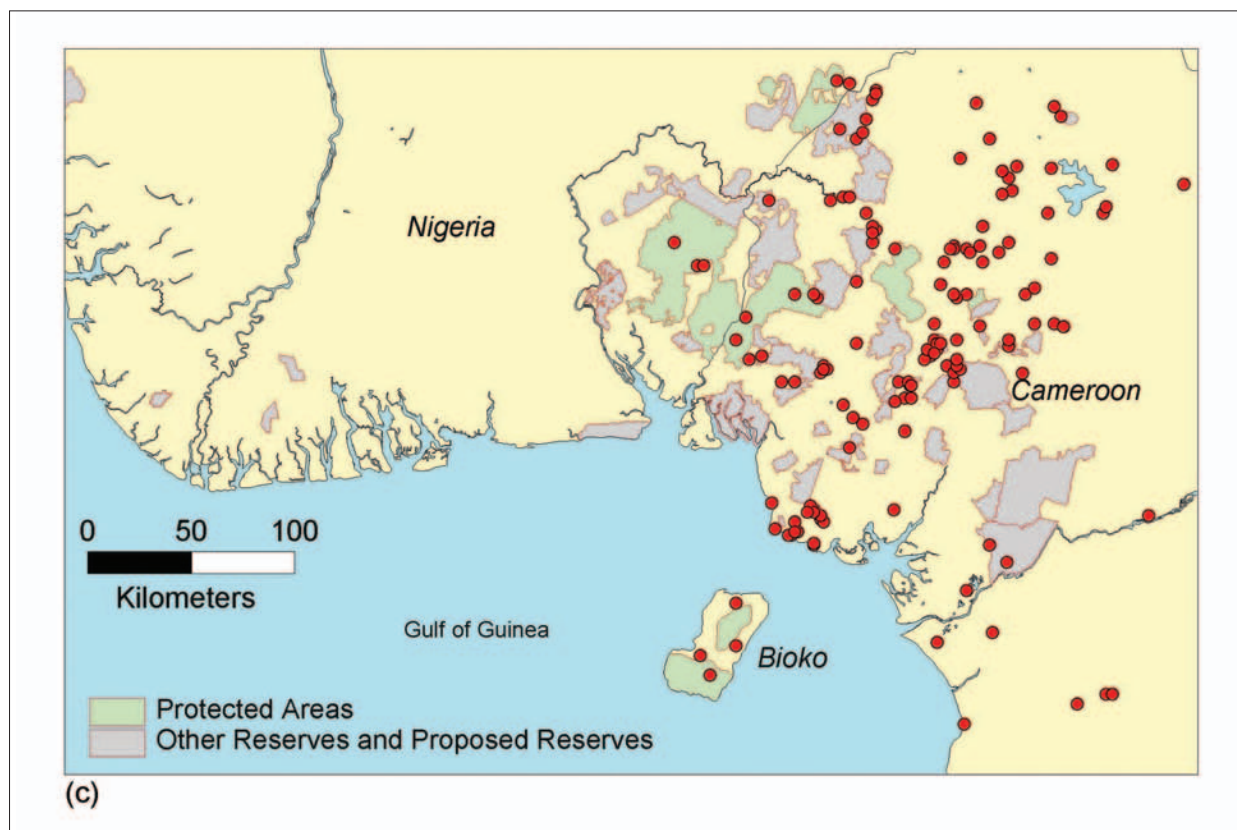


Figure 23 continued.

### Recommendation 8: Increase currently inadequate protection of endemic birds and amphibians.

A major aim of our study was to identify gaps in the existing protected area system, especially in relation to the distribution of endemic and threatened plants and animals. Figure 23 shows the distribution of endemic primates, birds, and anuran amphibians in relation to protected areas in the Gulf of Guinea forests. This map series indicates that endemic primates are relatively well covered (except between the Cross and the Niger), but birds and amphibians are not. The main reason for this is that many of the region's endemic birds and amphibians are associated with montane forest, which is poorly represented in the region's system of protected areas.

### Recommendation 9: Increase representation of montane forests in protected areas.

Presently the only montane forests legally designated for conservation are the higher elevations of the southern Banyang-Mbo Wildlife Sanctuary in Cameroon, a small northern area in the Okwangwo Division of Cross River National Park in Nigeria, and the Pico Basilé National Park on Bioko, and even the protection available within these few areas is limited and often ineffective. For instance, Banyang-Mbo is a community-based management area where hunting occurs, and Pico Basilé still has no organized protection system. Because montane endemic species tend to have highly localized distributions—many occur at just

one or, at most, only a handful of sites—many more montane protected areas are needed in the Gulf of Guinea forests. Important sites for montane endemics that currently lack full legal protection include the Obudu Plateau, Mount Cameroon, Mount Kupé, Mount Manengouba, Mount Oku, and the Bamenda Highlands. We strongly endorse MINEF's plan to upgrade the conservation status of Mounts Kupé and Manengouba, and the Bakossi Mountains. In Nigeria, the importance of the Sankwala Mountains requires investigation.

### Recommendation 10: Put high priority on conservation in several lowland forest reserves.

Although lowland forest endemics in the Gulf of Guinea forests (including many primates and several large tree and amphibian species) are relatively well covered by existing protected areas, including the Korup and Cross River National Parks, the full suite of lowland endemics would be more secure if the management plans of several important lowland forest reserves were more focused on conservation. In particular, upgraded conservation status is needed for the lowland forest reserves of Apoi Creek and Stubbs Creek in Nigeria, which contain endemic taxa not found in Korup or Cross River National Parks. More attention should also be given to conservation in several forest reserves bordering existing protected areas. These include, in Nigeria, Cross River South and Ukon River, together with lowland sections of Afi River, and, in Cameroon, Ejagham. A greater emphasis on

conservation is also needed in the lowland forest reserves of the Mount Cameroon foothills in Cameroon.

### Recommendation 11: Improve the conservation of endangered primates.

#### Cross River gorilla (*Gorilla gorilla diehli*)

Most of the known populations of Cross River gorilla (*Gorilla gorilla diehli*) occur outside legally protected areas. The only exceptions are the subpopulations in Afi Mountain Wildlife Sanctuary and in the Boshi Extension section of Cross River National Park, Okwangwo Division. The conservation status of gorilla habitat in other areas, especially the Mbe Mountains and the Takamanda and Mone River Forest Reserves, needs to be improved.

#### Nigeria chimpanzee (*Pan troglodytes vellerosus*)

If this subspecies is recognized as distinct from the western chimpanzee (*P. t. verus*), it occurs only in Nigeria and western Cameroon. Within our study area, chimpanzees occur in all the mainland protected areas, but not on Bioko. Like other primates, chimpanzees suffer from bushmeat hunting and are nowhere abundant. *P. t. vellerosus* ranges north of the limits of our study region into the forest-savanna mosaic zone. In this zone it is found in Nigeria's largest national park, Gashaka-Gumti, in Adamawa and Taraba States. Gashaka-Gumti has an area of 6,402 km<sup>2</sup> and an estimated chimpanzee population of 1,500 individuals. Within the Gulf of Guinea forests, chimpanzees suffer from bushmeat hunting and are not abundant anywhere. Like gorillas, chimpanzee populations are especially vulnerable to hunting because of their slow rate of reproduction. They need strong protection wherever they occur.

#### Subspecies of Pennant's red colobus monkey (*Procolobus pennanti*)

Each of the three subspecies of red colobus monkey (*Procolobus pennanti*) occurring in the Gulf of Guinea forests has a highly localized distribution. Red colobus monkeys are also very susceptible to hunting. Currently the Niger Delta red colobus (*P. p. epieni*) is not protected at all because no protected areas exist in the Niger Delta. Preuss's red colobus (*P. p. preussi*) may still be scattered across a handful of sites in Nigeria and Cameroon—a population survives in Korup National Park and adjacent parts of the Oban Division of Cross River National Park in Nigeria, and another population may occur in or near the Ebo Forest, Cameroon. All of these remaining populations need better protection. Pennant's red colobus (*P. p. pennanti*) may now occur only in a small southern area of Bioko, where the terrain and low hunting pressure give it some protection. Nevertheless, its prospects for survival will improve if an effective reserve is established in the area.

#### The drill (*Mandrillus leucophaeus*)

The drill (*Mandrillus leucophaeus*) occurs in all the protected areas, but is hunted everywhere except, perhaps, parts of southern Bioko. More drill habitat thus needs to be protected,

and hunting laws must be more rigorously enforced. The drill is particularly vulnerable to hunting with dogs. In addition, the future of the Bioko drill (*M. l. poensis*) would be more secure if the island's protected zones were made fully effective.

#### Sclater's guenon (*Cercopithecus sclateri*)

Sclater's guenon occurs only between the Niger and Cross Rivers in Nigeria, and is not found in any formally protected area. New surveys suggest that this species is more widespread than was recently suspected, but populations are mostly small and fragmented. The status of some of the forest reserves where Sclater's guenon occurs (especially Stubbs Creek) should be upgraded, and efforts should be made to protect this monkey from hunting wherever it occurs.

#### Preuss's guenon (*Cercopithecus preussi*)

Our study indicates that Preuss's guenon (*Cercopithecus preussi*) occurs over a relatively wide area, but is largely restricted to hill areas. Although it is semi-terrestrial like the drill, Preuss's guenon is a quieter, more secretive animal, and thus less easily hunted. However, it has still been reduced by hunting in many parts of its range, and much of its remaining montane forest habitat, such as the Obudu Plateau, is threatened. Preuss's guenon would benefit from a network of effective montane-forest protected areas.

#### The crowned guenon (*Cercopithecus pogonias pogonias*)

The crowned guenon (*Cercopithecus pogonias pogonias*) occurs in protected areas on the mainland and Bioko (Southern Highlands). Any measures aimed at reducing hunting in protected areas would benefit this species. Differences between the island and mainland populations should be clarified, as the Bioko form may be a distinct subspecies (Gautier-Hion *et al.* 1999).

#### The white-throated guenon (*Cercopithecus erythrogaster pococki*)

Most of the range of the white-throated guenon (*Cercopithecus erythrogaster*) is to the west of our study region, but small populations occur in the western and central parts of the Niger Delta. *C. erythrogaster* is found in one protected area, the Okomu National Park in Edo State, southwestern Nigeria. Protected areas are needed in the Niger Delta, and it would be advisable for one of these to include *C. erythrogaster*.



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