

High mammalian diversity in the newly established National Park of Upper Niger, Republic of Guinea

Stefan Ziegler, Gerhard Nikolaus and Rainer Hutterer

Abstract This paper presents the results of a mammal survey conducted between 1995 and 1997 in the newly established National Park of Upper Niger in the Republic of Guinea, West Africa. Ninety-four species of mammals were recorded in the park area and its environs; 19 of these species were newly recorded or confirmed for Guinea. The fauna of the park includes about 50% of the known mammalian diversity of the country. Among the species found are West African endemics such as the Gambian mongoose *Mungos gambianus*. The park, although situated in the Guinea savannah belt,

includes some remnant forest, which harbours tropical forest mammals such as Thomas's galago *Galagoideus cf. thomasi*, hump-nosed mouse *Hybomys planifrons*, soft-furred rat *Praomys rostratus* and flying squirrel *Anomalurops* sp.. This National Park is a high priority area for the conservation of the vertebrate diversity of West Africa.

Keywords Fauna, Guinea, mammalian diversity, National Park, Upper Niger.

Introduction

Management and conservation of natural resources have a relatively recent history in the environmental policy of the Republic of Guinea, West Africa. One important aspect of this policy has been the establishment of forest reserves (*forêts classées*), which cover 5% of the country (IUCN, 1988). The former colonial French administration gave these forest reserves a protected status, which was adopted by the country after independence in 1958. Although a number of National Action Plans were designed in the early 1990s to protect the country's natural resources and to limit their exploitation, many of the protected forests are now severely degraded. Political and socio-economic factors have led to uncontrolled resource exploitation, and this process has been compounded by the increase of the human population. Consequently, ecologically intact forests can only be found in remote areas characterised by a relatively low human population density.

One of these areas of low disturbance is the Mafou forest, which is one of the last remaining formations of dry forest in this climatic zone in West Africa, and is the last forest of this type in Guinea. The Mafou forest

constitutes the core zone of the National Park of Upper Niger, established in 1997. Inventories of the flora and fauna of the Park were initiated by the Park authorities and supported by the European Union. Here we present the results of the first mammal survey of the National Park of Upper Niger, and discuss its significance for the conservation of mammals in Guinea and West Africa.

Methods

The National Park of Upper Niger

The National Park lies within the Upper Guinea province in the north-eastern part of the Republic of Guinea (Fig. 1), and covers a total area of about 6000 km². The Mafou forest, of approximately 600 km², constitutes a completely protected zone with a minimum of human interference. It is surrounded by two buffer zones where the local people are permitted to engage in controlled utilization of natural resources, such as agriculture, hunting and fishing.

Deserted villages indicate that the region was not always uninhabited. The widespread occurrence of river-blindness and the atrocities of Samory Touré (1830–1900), who built up the Islamic Ouassoulou-Kingdom and became famous through his tenacious resistance against the French colonial power, were probably the main causes of the area's depopulation. Over the last 50 years little environmental disturbance has occurred in the core area, although about 40,000 people live in the National Park today. While the Mafou forest has no permanent settlement, population density in the inner buffer zone is around 1.1 persons km⁻² and

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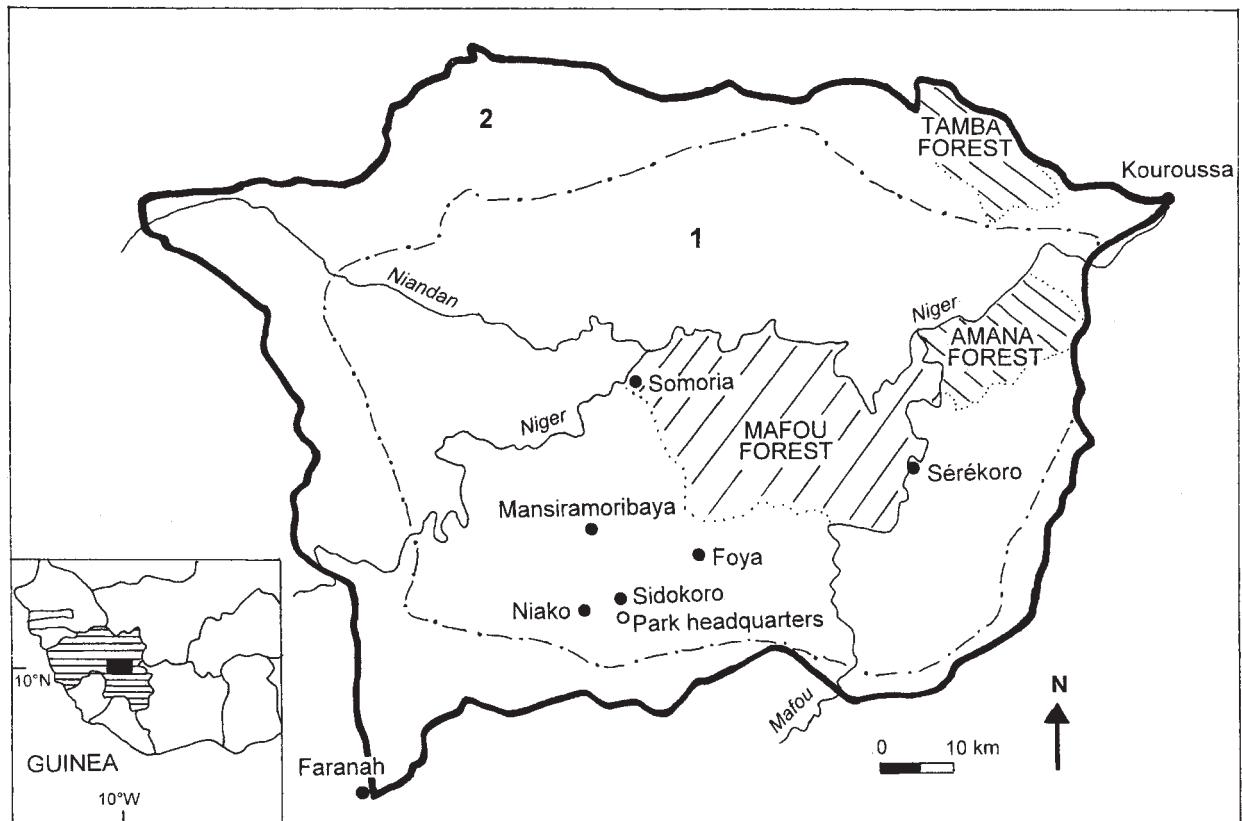


Fig. 1 Map of the National Park of Upper Niger showing the survey sites and bushmeat market locations. The park boundary, buffer zones 1 and 2, forests and major rivers are indicated.

around 6.8 persons km^{-2} in the outer buffer zone, increasing towards the periphery of the Park. Agricultural activities are permitted in the outer buffer zone in order to increase the income of the local communities and to reduce the human pressure on the inner zones. Farmers cultivate rice, manioc, maize and peanuts, mostly as subsistence farming. The region provides several non-timber forest products for local communities, of which commercial and subsistence hunting of game for human consumption are the most important. The government encourages the local population to use their natural resources in a sustainable way; shares in fishing, hunting and timber harvesting are fixed annually in cooperation between the government and the local communities.

The region has a mean total annual rainfall of 1400–1700 mm, with a rainy season from June to October. Mean monthly temperature is 17°–25 °C, with a maximum of 35 °C at the end of the dry season in April and May (Montfort & Jansen, 1993). The majority of the area consists of a granite plateau bordered by alluvial plains along the Rivers Niger and Mafou (Fig. 1). The plateau, with its low undulation and gentle slopes of 2–8%, is interspersed with low-lying areas resulting from erosion

caused by creeks. Altitude is 300–600 m. Several small cliffs in the southern area harbour caves.

The area is located in the southern Guinea savannah belt. The dominant habitat (85% of total area) is relatively dense savannah that, depending on local topographical and edaphic conditions, consists of woodland and bushland with *Azelia africana*, *Burkea africana*, *Parinari curatellifolia*, *Bridelia ferruginea*, *Pterocarpus erinaceus* and *Daniellia oliveri* as dominant species. A number of common northern Guinea savannah trees (*Monotes kerstingii* and *Uapaca togoensis*) are also found in the Park. Five per cent of the total area is covered by fairly open savannah grassland composed of *Andropogon gayanus*, *Hyperrhenia* sp. and *Imperata cylindrica*. Savannahs are intersected by fringing forests that constitute 5% of the area along the rivers Niger and Mafou and by remnants of semi-deciduous forest growing on rich soils in depressions that often include a small swamp, lake or spring. These forests (also known as bowl forests) have a diverse flora, characterised by *Chlorophora excelsa*, *Erythrophleum guineensis*, *Pterocarpus santalinoides* and *Syzygium guineensis*. Five per cent of the park area is under agricultural use, mainly in close proximity to the villages on the edge of the park.

The savannah formations are burned each year during the dry season, frequently destroying the understorey and most saplings. On the grass savannah the fires start in November and continue until the first long-lasting rain in June. The repeated burning favours fire-resistant plant species such as *Azelia africana*, *Cassia sieberiana*, *Daniellia oliveri*, *Gardenia ternifolia*, *Parkia biglobosa*, and *Syzygium guineense* var. *microcarpum*. The impact of these fires upon the composition of the small mammal community has not yet been assessed.

Survey methods

A bird (Nikolaus, 2000) and mammal survey was conducted in 1996–97 within and around the Park. The purpose of the survey was to provide an inventory of the mammal species inhabiting the park, to build up a reference collection for the park headquarters, and to train park rangers and students in the identification of mammals. For technical reasons (road access and availability of vehicles) the survey concentrated on buffer zone 1 (Fig. 1), while sites inside the Mafou forest and in buffer zone 2 were less frequently surveyed. From December 1996 to April 1997 all observed mammals, tracks and scats in and around the park were noted. All observations were made during the dry season. For one month (mid-March to mid-April 1997) two lines of pitfall traps were run in grassland near a river. Each line consisted of 3–4 large buckets connected by a 5 m long wooden board. Traps were checked daily. Over a period of two months (January–March) 50 snap traps (20 mouse traps and 30 rat traps) were set for one week each in the following habitats: woodland, grassland, swamp, bowl forest, river edge, rice field, rocks, villages and houses. These traps were placed both on the ground and on tree branches. Ten 2 × 12 m mist-nets were set for one night each in the same habitats to survey for bats. In addition, the skills and knowledge of local children and adults were used to obtain data on mammals in the Park. Children actively participated in the collection of small mammals, while adults shared their knowledge about the current and former presence of large mammals. Owl pellets were collected at five sites within and around the park.

Hunting of mammals was studied by counting fresh carcasses at the area's main market in Faranah from January 1995 to December 1996 (Ziegler, 1996). Weekly counts in smaller village markets (Foya, Mansiramoribaya and Niako) were also conducted from February to March 1997.

Collections of reference specimens have been deposited at the park headquarters at Sidokoro (Fig. 1), and in the Museum Alexander Koenig, Bonn. The scien-

tific nomenclature follows Wilson & Reeder (1993), except for *Anomalurops*, which we regard as a distinct genus in accordance with Grubb *et al.* (1998). Common names were adopted from Kingdon (1997).

Results

We found evidence for the presence of 94 species of mammals in the park (Table 1): nine insectivores, 18 bats, seven primates, two pangolins, 17 carnivores, one hyrax, one aardvark, 14 ungulates, 24 rodents, and one hare. Three further species included in the list (elephant, lion and manatee) were once present, as testified by older people living in the park, but vanished some decades ago. Of the species recorded here, 14 were labeled as 'possible' and two as 'unconfirmed' in a recent checklist of Guinea mammals (Barnett & Prangley, 1997). Subsequently Colyn *et al.* (2000) and Konstantinov *et al.* (2000) confirmed the presence of three species from the possible category (*Mungos gambianus*, *Hipposideros commersonis* and *Chaerephon pumila*) and one species from the unconfirmed category (*Nycteris thebaica*). The remaining 12 species, plus seven further new records, are briefly discussed below. Information on the other species can be found in Table 1.

African hedgehog *Atelerix albiventris*. Reported to occur in the park by park rangers. Although widespread in West Africa, the species has not previously been reported from Guinea.

White-toothed shrew *Crocidura denti*. Two individuals were captured in a rice field at Sidokoro. This is a new record for Guinea, and the second record for West Africa, after a report by Heim de Balsac (1971) based on a single specimen from Mt Loma, Sierra Leone. The species is otherwise known from Cameroon and further eastwards in the Congo Basin.

Singing fruit bat *Epomops franqueti*. A female was netted in the forest at Sidokoro. The westernmost occurrence of this fruit bat had previously been Côte d'Ivoire (Bergmans, 1989; Grubb *et al.*, 1998). The new record from Guinea represents a considerable western range extension.

Horseshoe bat *Rhinolophus alcyone*. Two specimens of this forest bat were obtained at the local market of Mansiramoribaya and represent the first confirmed record for Guinea. Barnett & Prangley (1997) listed the species as 'possible', and Happold (1987) included Guinea in a table of occurrence without comment. The bat is also known from Sierra Leone (Grubb *et al.*, 1998).

Leaf-nosed bat *Hipposideros cyclops*. A female was netted in dense forest at Somoria (Fig. 1). The occurrence of this bat in Guinea was listed as 'possible' by Barnett & Prangley (1997), and the country was included into the species range by Corbet & Hill (1991) without

Table 1 List of mammals observed in the National Park of Upper Niger. V = voucher specimen examined; M = seen on bushmeat market; O = field observation; P = in owl pellets; R = reliable report; S = scats; D = species formerly present but now disappeared. Red List categories as in Hilton-Taylor (2000), with criteria: EN Endangered, VU Vulnerable, LR/nt Lower Risk/near threatened, LR/cd Lower Risk/conservation dependent.

Species	Record type	Bushmeat offered at local (L) or central (C) market	Red List 2000 status
Insectivores			
<i>Atelerix albiventris</i> (African hedgehog)	R		
<i>Crocidura crossei</i> (white-toothed shrew)	P		
<i>Crocidura denti</i> (white-toothed shrew)	V		
<i>Crocidura foxi</i> (white-toothed shrew)	V		VU B1 + 2c
<i>Crocidura fuscomurina</i> (white-toothed shrew)	V		
<i>Crocidura lamottei</i> (white-toothed shrew)	V		
<i>Crocidura nanilla</i> (white-toothed shrew)	V		
<i>Crocidura olivieri</i> (African giant shrew)	P		
<i>Sylvisorex megalura</i> (climbing shrew)	V		
Bats			
<i>Epomophorus gambianus</i> (epauletted fruit bat)	V		
<i>Epomops franqueti</i> (singing fruit bat)	V		
<i>Micropteropus pusillus</i> (dwarf epauletted fruit bat)	V		
<i>Myonycteris torquata</i> (collared fruit bat)	V		
<i>Nanonycteris veldkampii</i> (flying calf)	V		
<i>Nycteris hispida</i> (slit-faced bat)	V		
<i>Nycteris thebaica</i> (slit-faced bat)	V		
<i>Rhinolophus alcyone</i> (horseshoe bat)	V		
<i>Hipposideros caffer</i> (leaf-nosed bat)	V		
<i>Hipposideros commersoni</i> (leaf-nosed bat)	V		
<i>Hipposideros cyclops</i> (leaf-nosed bat)	V		
<i>Hipposideros ruber</i> (leaf-nosed bat)	V		
<i>Eptesicus capensis</i> (serotine bat)	V		
<i>Eptesicus guineensis</i> (serotine bat)	V		LR/nt
<i>Pipistrellus nanus</i> (banana bat)	V		
<i>Scotophilus leucogaster</i> (house bat)	V		
<i>Chaerephon nigeriae</i> (wrinkle-lipped bat)	V		
<i>Chaerephon pumila</i> (wrinkle-lipped bat)	V		
Primates			
<i>Galagoideus cf. thomasi</i> (Thomas's galago)	V, M	L	
<i>Galago senegalensis</i> (Senegal galago)	V, M	L	
<i>Chlorocebus aethiops</i> (grivet monkey)	V, M	L	
<i>Erythrocebus patas</i> (patas monkey)	M	C	
<i>Papio hamadryas</i> (sacred baboon)	V, M	C	LR/nt
<i>Colobus polykomos</i> (western pied colobus)	V, M	L	LR/nt
<i>Pan troglodytes</i> (chimpanzee)	V, M	C	EN A1cd + 2cd
Scaly ant-eaters			
<i>Manis gigantea</i> (giant pangolin)	V, M	L, C	
<i>Manis tricuspis</i> (tree pangolin)	V	L	
Carnivores			
<i>Canis adustus</i> (side-striped jackal)	V		
<i>Aonyx capensis</i> (African clawless otter)	V, R		
<i>Lutra maculicollis</i> (spot-necked otter)	R		VU A1c
<i>Mellivora capensis</i> (ratel)	V		
<i>Atilax paludinosus</i> (marsh mongoose)	V, M		
<i>Galerella sanguinea</i> (slender mongoose)	V, M	L	
<i>Herpestes ichneumon</i> (ichneumon)	V, M	L	
<i>Ichneumia albicauda</i> (white-tailed mongoose)	V, M	L	
<i>Mungos gambianus</i> (Gambian mongoose)	V, M	L	
<i>Civettictis civetta</i> (African civet)	V, M	L	
<i>Genetta pardina</i> (genet)	V, M	L	
<i>Nandinia binotata</i> (African palm civet)	V, M	L	
<i>Crocuta crocuta</i> (spotted hyaena)	S		LR/cd
<i>Caracal caracal</i> (caracal)	O		

Table 1 (continued).

Species	Record type	Bushmeat offered at local (L) or central (C) market	Red List 2000 status
<i>Felis silvestris</i> (wild cat)	R		
<i>Profelis aurata</i> (golden cat)	R, S		
<i>Panthera leo</i> (lion)	D		
<i>Panthera pardus</i> (leopard)	R		
Sirenians			
<i>Trichechus senegalensis</i> (African manatee)	D		VU A1cd
Proboscids			
<i>Loxodonta africana</i> (African elephant)	D		EN A1b
Hyraxes			
<i>Dendrohyrax dorsalis</i> (tree hyrax)	O		
Aardvarks			
<i>Orycteropus afer</i> (aardvark)	V, M	C	
Even-toed ungulates			
<i>Hylochoerus meinertzhageni</i> (giant hog)	O		VU A2cd, B1 + 2abde
<i>Phacochoerus africanus</i> (common warthog)	V, M, O	L, C	
<i>Potamochoerus porcus</i> (red river hog)	V, O	L	
<i>Hippopotamus amphibius</i> (hippopotamus)	O		
<i>Alcelaphus buselaphus</i> (hartebeest)	M, O	C	LR/cd
<i>Cephalophus maxwelli</i> (Maxwell's duiker)	V, M	L, C	LR/nt
<i>Cephalophus rufilatus</i> (red-flanked duiker)	V, M	L, C	LR/cd
<i>Cephalophus silvicultor</i> (yellow-backed duiker)	V, M	C	LR/nt
<i>Hippotragus equinus</i> (roan antelope)	R		LR/cd
<i>Kobus ellipsiprymnus</i> (waterbuck)	M, O	C	LR/cd
<i>Kobus kob</i> (Kob)	M, O	C	LR/cd
<i>Syloicapra grimmia</i> (bush duiker)	R		
<i>Syncerus caffer</i> (African buffalo)	M, O, S	C	LR/cd
<i>Tragelaphus scriptus</i> (bushbuck)	M, O	C	
Rodents			
<i>Anomalurops</i> sp. (flying squirrel)	V, M	L	
<i>Funisciurus pyrropus</i> (fire-footed rope squirrel)	V, M	L	
<i>Heliosciurus gambianus</i> (Gambian sun squirrel)	V, M	L	
<i>Heliosciurus rufobrachium</i> (red-legged sun squirrel)	V, M	L	
<i>Xerus erythropus</i> (striped ground squirrel)	V, M	L	
<i>Arvicanthus</i> sp. (unstriped grass rat)	V		
<i>Cricetomys gambianus</i> (giant pouched rat)	V, M	L	
<i>Dasymys rufulus</i> (shaggy swamp rat)	V		
<i>Hybomys planifrons</i> (hump-nosed mouse)	P		
<i>Lemniscomys bellieri</i> (zebra mouse)	V		
<i>Lemniscomys striatus</i> (zebra mouse)	V, P		
<i>Mastomys erythroleucus</i> (multimammate rat)	V, P		
<i>Mastomys hildebrandtii</i> (multimammate rat)	V, P		
<i>Mastomys natalensis</i> (multimammate rat)	V, P		
<i>Mus musculoides</i> (common mouse)	V, P		
<i>Myomyscus daltoni</i> (meadow rat)	V, P		
<i>Myomyscus derooi</i> (meadow rat)	V		
<i>Praomys jacksoni</i> (soft-furred rat)	V, P		
<i>Praomys rostratus</i> (soft-furred rat)	V, P		
<i>Tatera guineae</i> (Tatera gerbil)	V, P		
<i>Uranomys ruddi</i> (brush-furred mouse)	V, P		
<i>Atherurus africanus</i> (brush-tailed porcupine)	V, M	L	
<i>Hystrix cristata</i> (crested porcupine)	V, M	L, C	
<i>Thryonomys swinderianus</i> (savannah cane rat)	V, M	L, C	
Hares			
<i>Lepus victoriae</i> (savannah hare)	V, M	L, C	

comment. The Somoria specimen is the first confirmed record from Guinea.

Serotine bat *Eptesicus capensis*. A female netted at Somoria represents the first confirmed record from Guinea. Lamotte (1942) mentioned a bat under the name *Eptesicus grandidieri* from Mt Nimba, but the possible allocation of that record to *E. capensis* is uncertain.

Banana bat *Pipistrellus nanus*. A female was netted at Somoria. There was no previous record from Guinea of this common and widespread little bat. Unpublished data by H. Vierhaus (pers. comm.) demonstrates the presence of the species further south in the Ziama and Diéké forests.

House bat *Scotophilus leucogaster*. A male was netted in forest at Sérékoro. This bat was previously known from neighbouring countries, but not from Guinea.

Wrinkle-lipped bat *Chaerephon nigeriae*. A female from Sérékoro represents the westernmost record of this species in Africa, formerly known only as far west as Sierra Leone (Grubb *et al.*, 1998).

Thomas's galago *Galagoides* cf. *thomasi*. Seventeen individuals were counted in the local market at Mansiramoribaya, six of which were obtained as samples. The species occurs in wet and densely forested depressions within the park. The animals resemble *Galagoides thomasi*, a forest species known from Cameroon eastwards to Uganda (Nash *et al.*, 1989) but are bright ochre-orange on the underside and have longer tails. *Galagoides thomasi* was not recognised in West Africa until Kingdon (1997) included this part of Africa in a distribution map for the species, without comment. Grubb *et al.* (1998) did not mention the species for any of the West African countries treated by them.

Ichneumon *Herpestes ichneumon*. Freshly killed specimens were seen at Mansiramoribaya and Sidokoro. The presence of this common species in Guinea was probable but it had not been documented before.

White-tailed mongoose *Ichneumia albicauda*. Specimens were found on the local market of Mansiramoribaya. This species has not been recorded from Guinea before, although it was known from several neighbouring countries.

Genet *Genetta pardina*. Common at the bushmeat market of Mansiramoribaya, and observed alive in the Mafou forest on one occasion. Barnett & Prangley (1997) listed *G. pardina* as 'possible' and *G. maculata* and *G. rubiginosa* as 'confirmed' for Guinea. It is probable that all three taxa refer to the single species *G. pardina* (Grubb *et al.*, 1998). Boitani *et al.* (1999) included all of Guinea in the possible range of the species.

Tree hyrax *Dendrohyrax dorsalis*. This species had not been recorded from Guinea but was to be expected. In March 1997 one of us (GN) saw an individual crossing a road in thick primary woodland near Somoria. H.

Vierhaus (pers. comm.) also heard the calls of the species frequently in Ziama and Diéké.

Flying squirrel *Anomalurops* sp. A specimen obtained from the bushmeat market of Mansiramoribaya resembled *A. beecrofti* but was much smaller. Its skull dimensions were the same as those of *A. beecrofti hervoi*, described from southern Senegal (Dekeyser & Villiers, 1951). Taxonomic studies on Anomaluridae indicate the existence of currently unrecognized species (Schunke & Hutterer, 2000), and the Guinea specimen may belong to one of them.

Zebra mouse *Lemniscomys bellieri*. This species was common in grassland in Somoria and in rice fields in Sidokoro. It was also seen as bushmeat at Mansiramoribaya. This is the first record from Guinea. It has previously been described from Ivory Coast and Ghana and possibly Sierra Leone (Grubb *et al.*, 1998).

Meadow rat *Myomyscus derooi*. A juvenile male from the village of Sérékoro represents the first record of this species from Guinea. It is otherwise known from Ghana to Nigeria (Grubb *et al.*, 1998).

Tatera gerbil *Tatera guineae*. Five specimens were recorded from Mansiramoribaya. This species is not mentioned for Guinea by Barnett & Prangley (1997), but is common in the Sudan and Guinea savannahs of West Africa (Grubb *et al.*, 1998).

Savannah hare *Lepus victoriae*. Hares were frequently found on the markets of Faranah and Mansiramoribaya. A specimen was identified as *Lepus victoriae*, as defined by Angermann & Feiler (1988). Barnett & Prangley (1997) listed *Lepus saxatilis* as 'confirmed' and *L. whytei* as 'possible' for Guinea. Both names probably refer to the same species.

Discussion

The survey reported here revealed that the National Park of Upper Niger contains a diverse mammalian fauna. Of the 94 recorded species, 18 (19.1%) are listed in one of the categories Endangered (2), Vulnerable (4), Lower Risk/conservation dependent (7) or Lower Risk/near threatened (5) of the IUCN 2000 Red list (Hilton-Taylor, 2000). The Endangered western chimpanzee occurs in small numbers in the Park. This peripheral population is not included in the African mammals databank (Boitani *et al.*, 1999). The same is true for other species such as giant pangolin and kob. Mammals classified as Vulnerable include giant hog, spot-necked otter and a shrew (*Crocidura foxi*). However, the classification of the latter species as Vulnerable is not justified because this shrew is widely distributed in the savannahs of West Africa. Lower risk species are one bat, two primates, one carnivore and eight ungulates (Table 1).

The park also supports important populations of species not covered by the Red List. The side-striped jackal is a rare species in West Africa, although considered to occur widely by Kingdon (1997). The only other record from Guinea (Dekeyser, 1951) was from half a century ago. The Gambian mongoose was frequently found on local markets (Table 1). Rosevear (1974) and Van Rompaey (1991) considered it to be a rare and little-known species, and its presence in Guinea was not noted before, although Boitani *et al.* (1999) included the country in the overall range of the species. Colyn *et al.* (2000) recently reported a specimen from Mt Nimba. The high frequency of carcasses seen at the local markets suggests that the Park supports a good population of this rare West African endemic. Other West African endemics are *Galagoides cf. thomasi*, *Cephalophus maxwelli*, *Anomalurops sp.*, *Hybomys planifrons*, *Lemniscomys bellieri* and *Praomys rostratus*. Most of these are confined to forest patches within the savannah zone, and are thus potentially vulnerable to habitat loss.

Bushfires and hunting are major factors affecting the fauna of the park. Hunting with fire-arms is a common activity for the local population. Meat from medium- and large-sized mammals is commercialised throughout the region and sold on the larger markets (Ziegler, 1996, 1997). Carcasses of eight Red List species were frequently found in the central bushmeat market of Faranah (Table 1). These were chimpanzee, baboon and six large ungulates. Subsistence hunting is considered to be high throughout Africa (Colell *et al.* 1994; Fitzgibbon *et al.* 1995), and in some areas the commercial bushmeat trade is becoming a severe conservation problem (reviewed by Bowen-Jones, 1999). Bushmeat commercialisation offers a significant monetary incentive to rural people. The local communities use this revenue to buy materials and items that their subsistence life does not usually provide. The management concept of the Park considers hunting as an important source of extra income for local people and promotes sustainable use of the fauna. Hence, hunting is not prohibited within the two buffer zones. The Park has begun to reorganise the traditional local hunter fraternities and cede to them the responsibility for permission and regulation of access into hunting areas. This participatory approach is considered by the Park authorities to be an effective way to limit the exploitation of game.

Our survey has increased the number of known mammal species in Guinea from 168 (as compiled by Barnett & Prangley, 1997) to 187. On a West African scale this figure is still low, and certainly will be increased by future surveys. From Ghana, a country of similar size, 225 species of mammals are known (Grubb *et al.*, 1998), from Guinea-Bissau 100 (Reiner & Simoes,

1999), Sierra Leone 171 (Grubb *et al.*, 1998), Liberia 193 and Ivory Coast 230 (Groombridge, 1991).

With 94 recorded mammal species, the National Park of Upper Niger supports half of the entire known mammalian diversity of the Republic of Guinea. Comparable surveys by Barnett *et al.* (1996) in the Kounounkan Massif, south-west Guinea, and by Angelici *et al.* (1999) in the Niger Delta, Nigeria, resulted in much lower counts of 33 and 60 mammal species, respectively. We therefore conclude that the National Park has a very diverse mammal fauna. Considering the rate of deforestation in Africa (Barnes, 1990), this newly created Park may have a key position in the conservation of wildlife in both Guinea and in all of West Africa.

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