

Tana River Colobus and Mangabey

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The numbers of both these highly endangered monkeys, found only on the Tana River in north-east Kenya, are down to about 2000, possibly fewer. The authors of this status and habitat survey describe the continuing threats to both animals and make proposals for a reserve to protect them.

The Tana River is the longest river in Kenya—300 miles in a straight line from source to mouth, but 500 miles following the broad northward loop, and probably at least double this figure following its lower course meanders.

The river can be divided into three sections: the upper as far as the Hargazo Falls on the northern bend; the middle from the Falls to about Wenje; and the lower from Wenje to the sea. The upper Tana receives all the permanent tributaries; below the falls the river loses water by evaporation, so that at its mouth the total water content is only half that below the falls. The middle section is bordered by a thin strip of continuous woodland, except where removed for cultivation, where the dominant tree is the Tana River poplar *Populus ilicifolia*, after which comes a broad belt of thorn thicket, more arid to the north, where it grades into the Somali desert, than to the south.

The lower Tana flows through a floodplain, and twice a year—mid-April to early June, and again in September and early October—swollen with the up-country rains, it overflows its banks, pouring out along floodwater channels, and flooding the land to a depth of 1–2 feet for a mile or more on either bank. In some years the floods are very low—in 1972 there was no April flooding at all—while in other years they are exceptionally strong, as in October 1961, when the water rose to 12 feet and did not subside until the following January. From Wenje to Garsen the floodplain consists of perennial grassland, dotted with patches of forest and woodland, and bordered away from the river by the thicket belt. Below Garsen the delta region begins, and here the grasslands are covered with borassus and doum palms, often so thick as to form forest-like associations.

It is in the forests and woodlands of the upper floodplain, between Garsen and Wenje, that the Tana River red colobus and the Tana River mangabey occur, and nowhere else. Both are threatened species listed in the IUCN *Red Data Book*.

Monkey Population

*Colobus badius rufomitratu*s, grey with a darker tail, red head, and a black and scowling face, looks superficially like the better-known red colobus from Uganda and the west shore of Lake Tanganyika. But detailed study, especially of its skull, reveals many differences, and suggests that it might in fact be better classed as a distinct species.

The mangabey *Cercocebus galeritus galeritus*, yellowish in colour with a light underside, contrasting black face, and a parting on the front of the crown from which long hairs diverge on either side of the forehead, has generally been classified alongside the agile mangabey *C. g. agilis* of Zaïre and Congo, but again detailed study suggests that the two may be not so close.

Three other monkeys live in and around the floodplain forests, extending, unlike the colobus and mangabey, both up and down the river and into the bush zone. These are yellow baboon *Papio hamadryas cynocephalus*, Sykes's monkey *Cercopithecus mitis albogularis*, and vervet monkey *C. aethiops pygerythrus*. Baboons are found in all habitats, Sykes's monkeys wherever there are trees, and vervets mainly in the bush zones, rarely venturing into true forest or on to the grasslands.

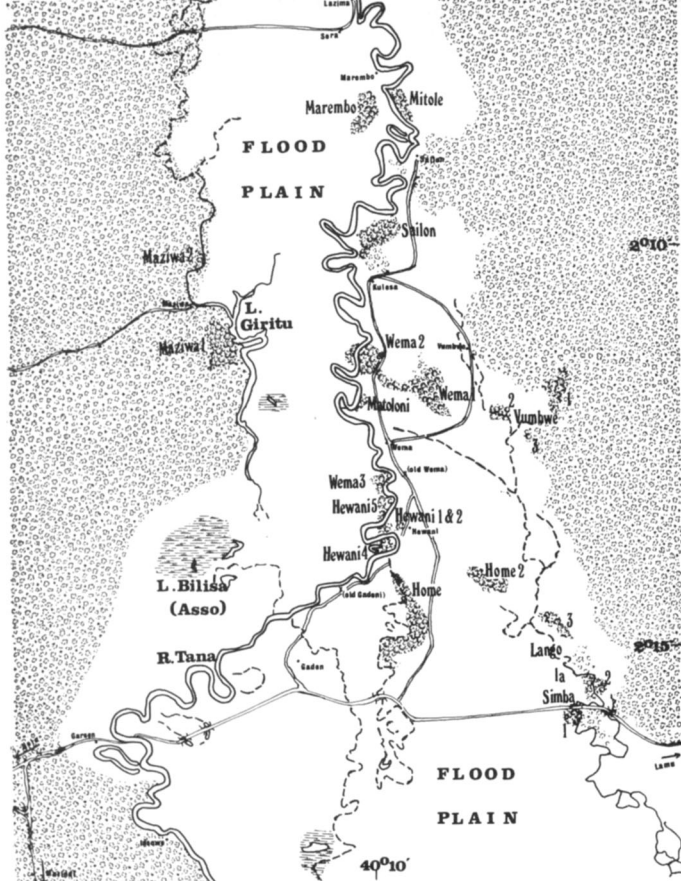
Habitat

The floodplain soils are mostly the heavy black clays known as 'black cotton'; these are alkaline with high soda concentrations and support nothing but grass. In places the soil is lighter in colour, sandier and better drained, and here forests may grow. Forest soils have a thin (4–5 cm. thick) humus layer below which the organic content drops rapidly and the sodium levels build up.

There are six types of floodplain forest and woodland associations:

1. *Acacia/Mimusops* woodland—extremely open with fairly thick ground cover, and characterised by the presence of *Acacia robusta usambarensis*, a tall, green tree with an open crown. Unexpectedly, this woodland type, which is commoner higher up the Lower Tana, supports both colobus and mangabey;
2. *Cynometra/Garcinia* woodland is commonest lower down the floodplain but above the delta region; colobus and mangabey can occur here but mostly it is too restricted in species for them;
3. Mixed evergreen forest is the commonest type of tree association, occurring mainly along the river itself from Garsen to Wenje, in patches of rarely more than 50 hectares. One of the largest, and perhaps the richest in variety, is the large (50-ha.) forest along an old river channel which we called the Home Forest. *Sorindeia* and *Diospyros* provide the main canopy, with a continuous lower canopy in which *Cola* and *Garcinia* predominate; there are also many emergents rearing above the canopy, such as *Sterculia*, *Oxystigma*, and an unidentified fig. Colobus and mangabey are abundant in such forests.
4. *Garcinia* forest: the only one of this type is a big (40-ha.) forest at Maziwa, along an old course of the Tana which still bears permanent water and is known as Lake Giritu. With a thick, closed canopy it is very dark, but with good visibility because there is no shrub layer; there are very few emergents. No colobus live here, but mangabeys are common.
5. *Pachystela* forest: the one forest of this type is opposite the village of Munazini, and has both colobus and mangabeys.
6. Cultivation forest: small (1–2 ha.) patches, left in a partial

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clearance for cultivation that was subsequently abandoned, tend to be dominated by mangoes and figs with a lower storey formed by *Trichilia roka*. Here colobus and mangabey seem to be commoner than anywhere else. It is not known whether they survived here during the cultivation, or whether they crossed open grassland to recolonise it after cultivation was abandoned.

RED COLOBUS Kipokomo name, Mbalawasi

Two factors seem to be essential for red colobus in the Tana forests: a variety of foods—according to Clutton-Brock (1972) they require a year-round supply of young leaves—and a fairly open canopy for warmth and sunlight. They do not occur in the woodlands along the edge of the floodplain, although these are commonly dominated by *Cynometra*, which is a food-plant for them elsewhere, doubtless because of the absence of many other foods; neither do they occur in the dark, even-canopied Maziwa forest.

In the larger forests colobus troops average 15 animals, with a range of 7 to 24; but in the tiny cultivation forests the average was only 8, with a range of 5 to 12. These numbers are far smaller than those recorded by Clutton-Brock (1972) and Nishida (1972) in Tanzania, and probably reflect the small size of the forests. Troops tend to be localised within a single forest, but not territorial; two

troops may be encountered near each other without any evident tension between them.

Colobus are easiest to see during the heat of the day (11 am to 4 pm) when they sit high in the open crowns, sunning themselves, possibly resting while their specialised digestive processes take their course (Hollihn, 1971). They sit clutching a branch or stem, bodies held erect and knees drawn up, their tails hanging down like bell-ropes. At these times they merely sit still and peer down at the observer looking up at them. But in the early morning and late afternoon, when they descend to feed in the lower canopy, they are very wary and one's only contact may be the sound of them crashing away through the trees, although they never seem to go far.

Their locomotion is thrilling to watch. Unlike baboons or mangabeys, colobus (both red and black-and-white) seem never to walk, but always bound. A foraging troop of Sykes's monkeys is in continuous motion, but colobus sit still to feed, reaching out to pull branches towards them, and plucking the leaves with their lips as much as their hands; when they do move, it is decisively, bounding along the branch to the next concentration of food. Moving between trees they jump, not in the hesitant, apologetic way of a Sykes's monkey, but as part of their normal locomotion without breaking stride, appearing simply to launch themselves into space; on landing they grasp a branch with both hands, bringing their feet forward to scabble for a hold. The sounds of colobus jumping—whether fleeing from observation or simply moving between food sources—are unmistakable heavy crashes. They often seem to associate with Sykes's monkeys, presumably for protection, and respond to their alarm call, but they rarely vocalise themselves. Very occasionally they let out a series of deep 'whop' calls; on one still morning we heard these a mile away.

MANGABEY Kipokomo name, Garau (Karau)

Mangabeys are rather more widespread than colobus in the Tana forests, but much more difficult to observe. In the early morning and late evening their presence can be detected by their loud calls, a couple of deep grunting booms followed by several hoarse screeches (for which the word 'garau' is weakly onomatopoeic). These seem to be inter-troop spacing calls; one such call will generally be answered a few seconds later from a distance, and in the early hours of the day troops call back and forth at intervals, sometimes for two or three hours on end. A derivation of this call is a simple 'garau' exchanged between members of the same troop when separated.

Unlike colobus, mangabeys are rarely seen and are often not even known to the local people. At Wenje, the northern point of their distribution, the name 'garau' is indifferently applied to both mangabey and vervet; further north, where mangabeys do not occur, the name is used for the vervet alone. At the southern end of their distribution, some people apply the word to Sykes's monkey; and a villager from Hewani, confronted with a mangabey in the forest, identified it as a baboon (Maionda). Indeed, an adult male mangabey could easily be confused with a baboon, and a female or young one

with a vervet, until one glimpses the characteristic parting on the crown.

Mangabeys spend at least half their time on the forest floor, foraging in the thin leaf litter, perhaps, on the analogy of the curiously similar Ceylon toque macaque *Macaca sinica*, for insects and fungi (Hladik & Hladik, 1972). In trees, where of course they are easier to see, they eat mainly fruit. A villager at Wenje, who knew the mangabeys well, told us that there is antagonism between them and baboons who sometimes chase them from food. Both occasionally associate with colobus and Sykes, but do not apparently seek them out as these two species seek out each other. In places, as at Maziwa and (reputedly) at Munazini, mangabeys will emerge from the forest into the surrounding bush, where they feed on certain seed-pods growing by the water.

We never saw mangabey troops of more than twelve animals, but our guides (Jilo-Paulo Simeon at Wenje, Komora Bashora at Munazini, and Kayene Jilo Heribai at Maziwa) told us they could be seen in troops of 30–50 at times, and Katherine Homewood, who is studying mangabeys at Munazini, tells us that she has seen such a troop herself. Gartlan (1970) has described a social structure among drills *Papio leucophaeus* of large troops of 50 or more which often break up into subgroups of under 20, each normally with a single adult male; this may also apply to the Tana River mangabey.

When they became aware of human beings in the vicinity, mangabeys almost invariably took to flight, either along the ground, in the trees, or up and down. The main exception to this was at Maziwa, where a troop of eight continued foraging along the ground as two of us walked parallel to them about 50 feet away. Jilo-Paulo Simeon told us that he normally had no trouble seeing mangabeys at Wenje, and that it may have been our white faces which startled them.

Distribution

In view of the mangabey's supposed greater rarity we were surprised to find that they are in fact more widely distributed than colobus. On the east bank they occur along the river from Wenje down as far as the Malindi-Lamu road, a straight distance of 35 miles, and also in places on the west bank where the forests do not extend quite so far. They also occur away from the river, at Maziwa, and they used to be found at Lango La Simba, about four miles from the river along a former course where there is still a little permanent water. One of us found mangabeys there in February 1972, but in July there were none, exactly why, we cannot say.

Colobus occur as far south as mangabeys—in the Home Forest, just north of the Malindi-Lamu road—but not as far north. They are reputed to be in forest near Kipende that we were unable to visit; if so, this would be their northern limit and would give a north-south range of 30 miles. They are not in the Maziwa forest, but they were formerly (February 1972) found at Lango La Simba. Repeated visits to the Lango La Simba forest in July and August 1972 produced only one colobus; there may have been a catastrophe which eliminated all mangabeys and all but one colobus, or perhaps the monkeys make

more seasonal movements than we are aware of, and went elsewhere through the surrounding bush.

The total forest area occupied by colobus is estimated at 648 ha., that by mangabeys at 733 ha. Mangabeys also utilise the bush immediately adjoining a forest area, so their available habitat is a little larger than this figure.

The big problem in the distribution of these animals is why are they in the Tana forests, and *only* there? Though there are occasional reports (e.g. Copley, 1950) of the Tana River red colobus in the Sokoke forest, near Malindi, we could not substantiate these during two days of visits and interviews there.

In East Africa, red colobus are found on Zanzibar (*C. b. kirkii*), in the Uzungwa range of southern Tanzania (*C. b. gordonorum*), near Lake Rukwa and along the eastern shores of the Western Rift lakes (*C. b. tephrosceles*). Of these, the last resembles *C. b. rufomitratu*s in its colour pattern but diverges strongly in its skull; while *kirkii* (and, to a lesser extent the little known *gordonorum*), resembles *tephrosceles* more in its skull but has a unique colour-pattern. If red colobus spread uniformly along the 'southern dispersal route' (Kingdon, 1971), one would expect *kirkii* to be intermediate between *tephrosceles* and *rufomitratu*s, which it decidedly is not. Two explanations are possible: 1) that colobus dispersed not along the southern route, but along a putative northern lowland route, north of the Kenya Highlands. While possible, there is no support for this in plant distributions and very little in the distributions of other animals—except perhaps the mangabey; 2) that there have been two 'waves' of colobus invasions along the southern route, an initial wave of *tephrosceles/rufomitratu*s-coloured colobus being replaced in the southern section by more specialised *gordonorum/kirkii*-coloured colobus. What advantage there might be in the more specialised colour-pattern for it to have replaced the other type is obscure; but it must be admitted that, in the absence of corroborative evidence for the first theory, the second seems more likely.

In East Africa mangabeys referred to as *Cercocebus galeritus* are found only along the Tana. Elsewhere they occur only in Zaïre, Congo, and parts of Cameroun and Gabon. Their absence from any part of the southern route, such as the Sokoke Forest, the Pangani gallery forests, the Usambaras or the Uzungwas, would be consistent with a northern dispersal route as described above. Examination of the species' ecology, however, suggests a different explanation. As the animal spends at least half its time foraging on the ground, such activity is presumably important to its well-being, and the thin leaf-litter of the Tana forests and woodlands might be expected to support a great variety of insect life, land crustaceans, fungi, fallen fruit and seedlings. Every few months, floods sweep through the forests carrying away the litter and killing the seedlings and ground vegetation, keeping the forest floor open and permitting mangabeys to come to the ground to exploit the new resources that spring up after the floods. It is therefore plausible that this species of mangabey is adapted to life in forest and woodland areas where there is seasonal

flooding, and that the absence of flooding in intermediate areas is the major reason why the mangabey has disappeared.

A further consideration is the finding (Groves, in preparation) that the Tana mangabey is no more closely related to the agile mangabey of Central Africa than is the collared/sooty mangabey group *C. torquatus* of West Africa. The conclusion is that the Central African forms ought to stand as a separate species, *C. agilis*, and that the isolation of the Tana species is long-standing. A gradual dispersal up the 'southern route', as rivers successively passed through a seasonal flooding phase, is therefore quite possible over a long period of time.

Estimated Numbers

Because colobus were so easy to observe it was possible to make a fairly accurate estimate of the population. Numbers and the density per hectare calculated were estimated for two large forests—Home Forest, a mixed evergreen forest, and the big evergreen forest, grading to *Acacia* woodland, immediately north of Munazini—and five small cultivation forests near Hewani and the defunct village of Ngatana. The Tana population was then worked out, taking into account the total area of such forests where colobus are found.

The Home Forest has about 130 colobus in eight troops, an estimate we consider fairly reliable since this forest was visited almost every day and several transects were made both lengthwise and breadthwise. The area is some 50 ha., giving a density of 2.6 per ha. The Munazini forest is considered, perhaps less reliably, to have a total of 90 colobus in about six troops, which for an area of 30 ha. gives a density of 3.0 per ha. The consistency of these figures gives a certain confidence that it is valid to extrapolate the average (2.8 per ha.) to the full 630 ha. of such forests as are occupied by colobus, giving a total of 1760 individuals. Certainly the impression gained in other forests briefly surveyed was not of any great variations in density.

The five cultivation forests, each of 1–2 ha., had colobus populations varying from 5 to 12, giving an average density of 5.75 colobus per hectare. The high density in these tiny forests might be ascribed to the presence of only one troop in each; competition between troops in larger forests would probably force the population density down below the maximum.

In total, however, there are not more than 17 ha. of cultivation forests, all of them being in the southern half of the floodplain, giving a probable figure of 100 colobus for all of them combined. The full colobus total would therefore be 1760 in the large forests and woodlands, and 100 in the cultivation forests, making 1860 in all. Of these, the quasi-continuous belt of forest from Munazini north to Makere ya Gwano contains about 1210, about two-thirds of the total.

Estimating mangabey numbers is far more subjective, and we often had to rely on figures given by reliable Pokomo observers. Jilo-Paulo Simeon, who enters the Wenje forest every day and whose information we invariably found reliable, considers that in the 30-ha.

forest there are about 90 mangabeys in three large troops, each occupying a different part of the forest. This is a mixed evergreen forest with more undergrowth than usual (flooding is incomplete) and a closed canopy making it very dark. Rather similar physiognomically is the 40-ha. Maziwa forest, which is however of a special type with *Garcinia livingstonei* predominant (type 4 above). Here Kayene Jilo Heribai, less familiar with the forest than Simeon but still fairly knowledgeable about it, estimated 200 mangabeys. The average of these two densities (3.0 and 5.0 per ha. respectively) is 4.0.

The Home Forest, most of which appears to experience very little flooding, seems very poor in mangabeys, which are evidently restricted to the northern and southern ends of the forest, rarely visiting the central portion with which we were familiar. We estimated 50 individuals, a density (if the whole forest is counted) of 1 per ha. In Munazini we estimated 90 individuals, a density of 3 per ha.; but the latest information (Katherine Homewood, pers. comm.) is that this may be too high by half.

Accepting an average of density for these four forests of 3 per ha., we arrive at a total of 2130 for the full 710 ha. occupied by mangabeys. In the 1-ha. cultivation forest on the west bank of the river, opposite Hewani, there are five mangabeys. Extrapolating this figure to cover other cultivation forests gives a total of 115 for the 23 ha. of this type of forest occupied by mangabeys. A 'world total' would then be 2245. While this figure, greater than that for colobus, is in accord with the wider distribution of mangabeys, its shaky foundation makes it a guide only: the true figure might be only half this (if, for example, there are many forests as unsuitable as the Home Forest in the large sample) or it may be half as much again. Katherine Homewood and Clive Marsh have indicated, on the basis of their continuing studies, that they prefer a low figure for mangabeys (about 1500).

We arrive therefore at total figures of 1860 for the red colobus (fairly reliable) and 2245 for mangabey (not very reliable). In both cases the Munazini/Makere group of forests contains some 60 per cent of the total.

Other Fauna

In addition to the five species of monkey, the following mammals were recorded by sight or by trapping in the flood-plain region:

Forest: bushbaby *Galago zanzibaricus*, Huet's bush squirrel *Paraxerus ochraceus aruscensis* at Hewani, red bush squirrel *P. palliatus tanae* at Wenje and Munazini, tree rat *Thamnomys dolichurus*, spiny mouse *Acomys subspinosus wilsoni*, pangolin *Manis* sp., genet *Genetta tigrina*, leopard at Munazini, elephant, bushpig, buffalo, and red duiker *Cephalophus natalensis*. Two forest species known from the Sokoke Forest, the golden-rumped elephant-shrew *Rhynchocyon chrysopygus* and Zanzibar duiker *Cephalophus adersi*, were looked for and enquired after, but not found.

Grassland: shrew *Crociodura* sp., grass mouse *Arvicanthis niloticus*, multimammate rat *Praomys natalensis*, civet, Egyptian mongoose

Herpestes ichneumon, marsh mongoose *Atilax paludinosus*, spotted hyaena *Crocuta crocuta*, serval, elephant, hippopotamus, buffalo, waterbuck, topi. Hunter's hartebeest *Damaliscus hunteri* does not occur on the floodplain, and appears to be restricted to the arid country inland from Lamu.

In the forests the lack of undergrowth appeared to have a marked effect on the bird fauna, which is rather impoverished at least at the southern end. But it is much richer in the Wenje forest, where mixed flocks can be seen. Two birds recorded in the Home Forest, the warbler *Bradypterus baboecola* and the sunbird *Anthreptes reichenowi*, are range extensions. Another interesting bird is the rare falcon *Falco chicquera*, which nests in the palm belts in a locality known as Mitapani ('the place of the palm-trees') at the south end of the Home Forest.

Conservation Prospects

The presence of two endemic subspecies (or species) of monkey, the intrinsic interest of a seasonally inundated forest-grassland complex, and the presence of the northernmost outliers of the East African coastal forests, make the Tana River floodplain a region of outstanding biological importance, some of which should be set aside as a reserve. The requirements are:

- 1) The reserve must be large enough to include viable chunks of all main habitats: forest, woodland, bush and grassland as well as sections of the river itself.
- 2) It must be protected from human interference, while respecting the rights of the people living there. The Pokomo have a river-based culture, and it would be unthinkable to translocate them, although some from the floodplain area are being encouraged to move to the irrigation scheme further upstream at Hola. Interference includes:
 - a) Forest clearance for cultivation. The cultivation forests along the river show that this has happened in the past; cultivation encroachment into the Wenje forest, and its abutment on the forests at Munazini and Maziwa, show it is an ever present danger that will grow as the human population expands and more cultivation is needed; comparison of the 1948 and 1962 census figures for the floodplain locations (Gwano, Ndera, Salama and Kinakomba) shows an average annual rate of population increase of 2.7 per cent over the 14 years. Although schemes such as the irrigation projects now under way at Hewani and Wema will doubtless result in increased agricultural yields per acre, expansion of the cultivated area is inevitable.
 - b) Grass burning. Every year the Orma, the cattle-keeping tribe of the floodplain, burn the grass near the river. In the process, some of the bush at the forest edge may get desiccated and killed, and so the following year is itself susceptible to burning. In this way the fire can push back the forest margins. At Lango La Simba, we observed fires within the forest itself, and wondered about the fate of the colobus and mangabey that once lived there.
 - c) Charcoal burning. In some forests we found trees being felled by

fires lit at the base so as to burn gradually through the trunk. Such fires could get out of control; and in any case, destruction of a sizeable living tree threatens quite a large area of forest. This method of felling is often used in making canoes.

- d) Firewood collecting. The Pokomo women collect firewood in the forest, usually dead wood, but some instances of live-wood cutting were noticed; even the removal of much dead wood is undesirable, depriving the soil of the nutrients released through its decay. Saplings are also cut for building poles.
- e) Hunting. The area is at present divided into hunting blocks. As far as the Pokomo and Orma are concerned, we did not get the impression that wilful destruction of animal life is a serious problem. Elephants and buffaloes that damage crops are dealt with by the Game Department; baboons are killed, if they can be caught, by the villagers themselves. Mangabeys only raid crops if these are right inside the forest, and colobus do not do so at all; but mangabeys are reputedly easy to catch, and a few years ago one was caught at Maziwa and sold to an FAO official as a pet. Only leopards—still trapped for their skins which are sold to Somali traders—seem to be under direct pressure.

3) Studies of the migration patterns of the larger fauna, especially elephants, are essential, and the reserve must include the whole of their transhumant range. Elephants restricted to a small part of their normal range would inevitably destroy the forests. Their numbers, in any case, must be watched.

4) Scientific considerations must take precedence in reserve management, but tourism could supply a useful source of revenue. The reserve would eventually be administered by the local people for their own financial benefit and prestige. Proximity to the Lamu tourist route would be a great help, and the plentiful large game in the grasslands provides an inbuilt tourism potential. There is no reason why small parties with a competent guide should not be permitted to look for monkeys or duikers in the forest.

The best area for a scientific reserve would undoubtedly be the forests north of Munazini, containing over half the total mangabey and colobus populations. In the thornbush country beyond the forests are zebra, warthog and Peters's gazelle *Gazella granti petersi*. Access points would be Munazini in the south and Wenje in the north.

We suggest also that special attention be given to the preservation of the Home and the Maziwa Forests, the former botanically rich and adjoining areas where topi and other floodplain herbivores can be easily seen, the latter a unique type of forest and prime mangabey habitat with easy viewing.

The extent of any reserve created would depend largely on the degree of human exploitation to be permitted within its boundaries, and some way should be found to limit this. Ideally some sort of conservation area should extend from the Malindi-Lamu road in the south to a little beyond Wenje in the north, and as far on either side of the river as is necessary to accommodate elephant movements and

desirable for tourist potential. The three forest blocks indicated—Munazini, Maziwa and Home Forest—need to be protected whatever the status of the surrounding countryside.

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References

- CLUTTON-BROCK, T.H. 1972. Feeding and ranging behaviour of the red colobus monkey. Ph.D.Thesis, University of Cambridge.
- COPLEY, H. 1950. Small mammals of Kenya. Highway Press, Nairobi.
- GARTLAN, J.S. 1970. Preliminary notes on the ecology and behaviour of the drill. In Napier, J.R. & P.H.ed., *The Old World Monkeys*. Acad. Press.
- HLADIK, C.M. & HLADIK, A. 1972. Disponibilités alimentaires et domaines vitaux des primates à Ceylan. *Terre et Vie*, 1972: 149–215.
- HOLLIHN, K-U. 1971. Das Verhalten von Guerezas, Nasenaffen und Kleideraffen bei der Nahrungsaufnahme und ihre Haltung. *Z.f.Säugetierk.* 36: 65–95.
- KINGDON, J. 1971. *East African Mammals*. vol. 1. Academic Press.
- NISHIDA, T. 1972. A note on the ecology of the red colobus monkeys living in the Mahali mountains. *Primates* 13: 57–64.

A paper by Katherine Homewood on the Tana River Mangabey will be published in the next issue of *Oryx*.

Enforcing the Endangered Species Act

The US Fish and Wildlife Service (which is the new name for the Department of Sport Fisheries and Wildlife) has in effect confiscated \$35,000-worth of imported crocodile shoes—the importers in fact 'transferred their ownership interest' to the US Government in settlement of a case brought against them for importing species on the endangered list.

Market for Tiger Skins

From Burma comes a report that a buying centre for animal skins and live crocodiles has been opened at Akyab, capital of Arakan State, adjoining Bangladesh. The price offered for a tiger skin is up to K.400 (£35; US \$100), for crocodile skins K.5 per foot. 'Tiger skins from Bangladesh', says our informant, 'are certain to be smuggled into Arakan to be sold at the buying centre'.

Marine Reserve in Tonga

The Tonga Government has created a reserve on the main island, Tongatapu, to protect 7000 acres of lagoon. Proposals to create marine parks on some coral reef areas are under consideration.