

Chimpanzee Survey in Mali, West Africa

Chimpanzees occupying dry habitats are particularly interesting because of the insights they provide on early hominid adaptations to a woodland/savanna way of life. Though certainly not "surrogate australopithecines," chimpanzees are undoubtedly closer to our ancestors in terms of morphology, physiology and intelligence than are other contemporary primates living in open woodland environments. By comparing chimpanzees living in hot, dry, "marginal" habitats with those living in more forested areas, we can hope to increase our understanding of the environmental pressures experienced during a move from the trees to the plains, and thus refine models of how our ancestors might have responded to these pressures (see Suzuki, 1969; Tutin *et al.*, 1983). In addition to conserving the species by protecting optimal forested habitat capable of supporting high chimpanzee densities, there is thus a compelling reason to protect smaller chimpanzee populations at the very limits of their acceptable ranges.

Kortlandt (1983) recently called attention to southwest Mali as possibly being the hottest and driest place in which western chimpanzees (*Pan*

troglodytes verus) exist. With funding from the L. S. B. Leakey Foundation and WWF-US, M. Mamadou Diakite (Eaux et Forêts, Mali) and I made a three-week survey of southwest Mali during December, 1984. The survey covered about 650 km by road and about 100 km on foot. In addition to the primary focus on chimpanzee distribution, we conducted a preliminary survey of a proposed national park site along the Bafing River between the towns of Bafing Makana and Manantali, where a large hydroelectric dam is under construction (Figs. 1-2).

Most of the survey zone lies between the 1100 mm and ca 1300 mm isohyets (PIRT, 1983). This zone has been termed "soudanien" or "soudano-guineen" by various authors (see Kortlandt, 1983) and is characterized by low rainfall (restricted to July through November) and high daytime temperatures. Much of the land is rocky with frequent lateritic plateaus (Fig. 3); some of which are surrounded by high cliffs broken by ravines that contain evergreen *Ficus*, etc. Many of these plateaus are covered with short grass during the rains, but are barren, rocky plains by January. Vegetation off the plateaus is diverse, and depends on the local history of human use as well as on soil depth and moisture. It is likely that all of the fertile soil in the region has been cultivated at one time or another, and the practice of annually burning off the grasses has probably affected the entire region.

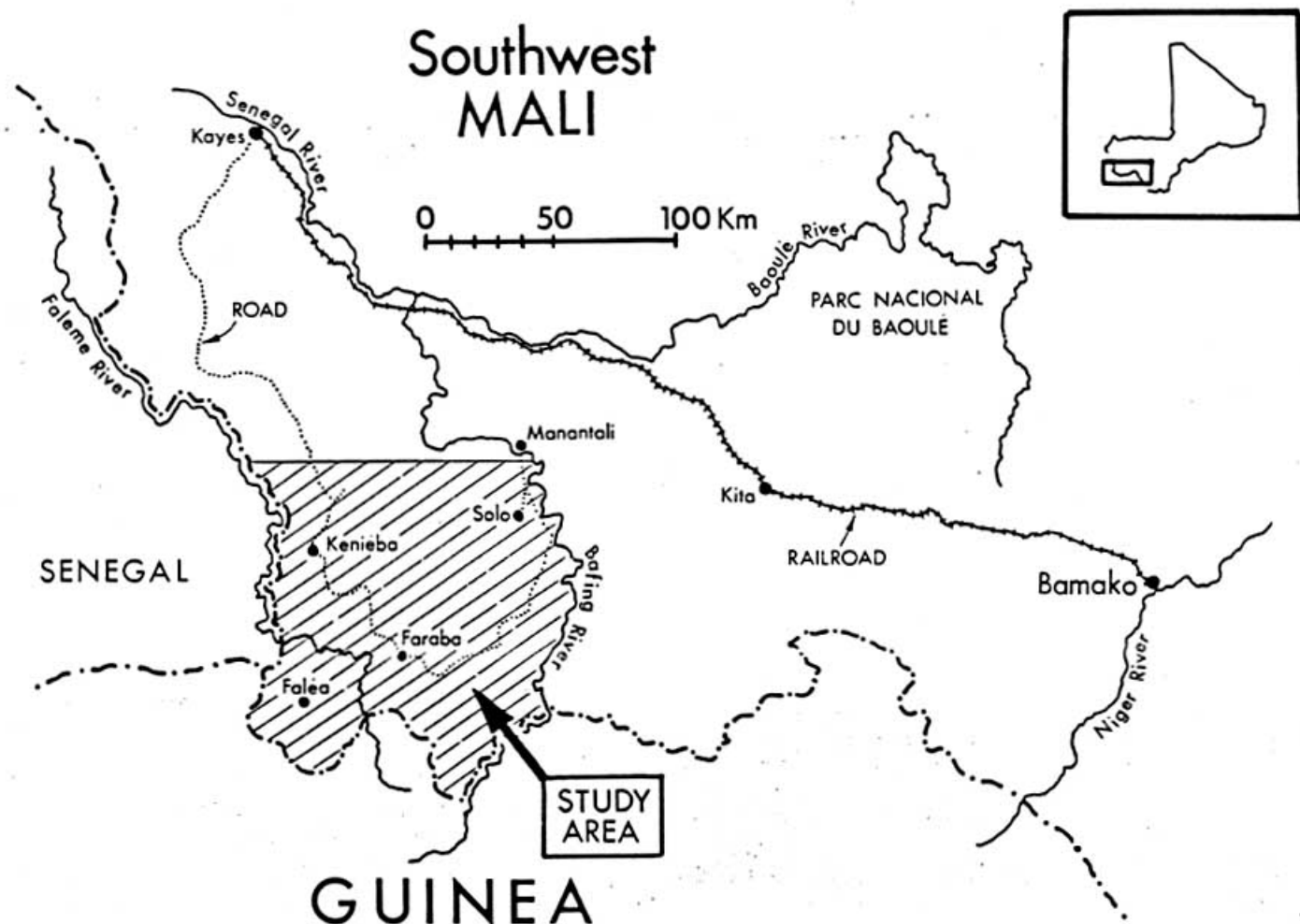


Fig. 1: Map showing the location of the study area in southwestern Mali (map by Stephen Nash from author's original).

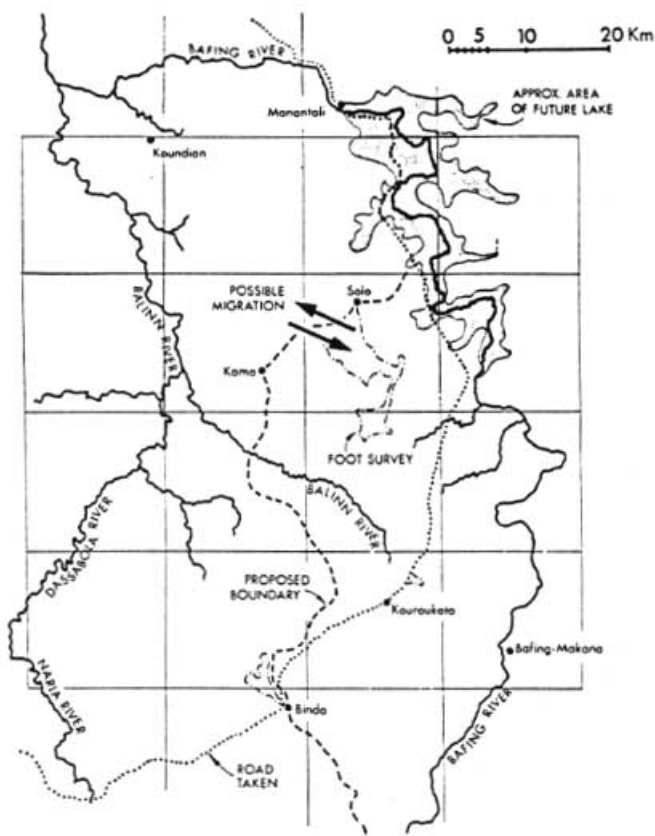


Fig. 2: Map showing portion of study area surveyed for proposed national park and region threatened by flooding from hydroelectric project (map by Stephen Nash from author's original).

The dominant woody plants in the zone include *Combretum* spp., *Pterocarpus erinaceus*, *Bombax costatum*, *Lannea* spp., *Parkia biglobosa*, *Terminalia* spp., *Daniellia oliveri*, *Detarium microcarpum*, *Vitellaria paradoxa*, and others. *Adansonia digitata* (baobab) are patchily distributed and many of the chimp nests we observed were near fruiting baobabs. Large mammals are scarce due to ubiquitous small-scale hunting; signs of buffalo, roan, hartebeest and warthog were encountered regularly near the Bafing River and we were told that eland, lion, leopard, and wild dog also occur at very low densities (see Sayer, 1977 for a summary of large mammal status in Mali). Human population density in the area is low ($5/\text{km}^2$; PIRT, 1983), but small hamlets are widespread and few if any areas are protected from hunting by simple absence of people.



Fig. 3: Cliffside forest at Dabia. Chimps utilize isolated forest patches on the steep slopes (photo by J. Moore).

After our survey along the route from Kayes-Faraba-Manantali, the distribution of chimpanzees was estimated by scoring 18 x 18 km quadrats on a 1:200 000 map as: (1) confirmed presence (nests seen); (2) suspected (habitat contiguous with neighboring confirmed presence areas); and (3) probable (maps and recent LANDSAT images show similarity to confirmed habitat and low human density) (Fig. 4). We were greatly aided in this by the use of 1:500000 LANDSAT imagery and vegetation maps compiled by the Projet Inventaire des Ressources Terrestres. The project's final report (PIRT, 1983) contains detailed information on vegetation, soils, hydrology, human demography etc. in southern Mali, and represents a valuable resource for anyone interested in West African ecology.



Fig. 4: Quadrat map used to estimate chimpanzee densities within the study area (C = confirmed presence [nests seen], S = suspected presence [habitat contiguous with confirmed presence areas], P = probable presence [habitat similar to confirmed presence areas and with low human population density]) (map by Stephen Nash from author's original).

We found chimp nests (Fig. 5) at all survey sites south of Kassama (about $13^{\circ} 30' \text{N}$; close to the 1100 mm isohyet on the Bafing), and saw two groups of chimpanzees near Binda: one of 2 adult females, 2 adult males, 1 subadult male and 1 juvenile, and a second group of 1 adult female and adult male, who interacted briefly with the 6-member group. Nests were observed as much as 20 km from the nearest permanent river but most seemed to be within about 10 km of available water and several local informants commented on range shifts as water holes dried up seasonally. This overall distribution agrees well with that found by Sayer (1977), except that our survey indicates that chimpanzees are spread widely through the *soudanien* woodland and are not restricted to riverine forest.

Recent fires throughout the survey area had singed many of the nests, making it difficult to estimate their ages and preventing us from quantitatively estimating chimpanzee populations based on nest counts alone (see Tutin & Fernandez, 1984). An alternative method is to assume a density equal to the lowest reported for chimpanzees, $0.08/\text{km}^2$ (Baldwin *et al.*, 1982), and calculate the population based on this figure. This would yield an estimate of about 190 chimps for the quadrats in which we confirmed chimp presence; including suspected

no accurate counts were obtained, so the results are only approximate:

Species	Troops/km ²	Approximate Density (#/km ²)
Baboon (<i>Papio papio/anubis</i>)	0.1 - 0.2	15 at 100/troop
Vervet (<i>Cercopithecus aethiops</i>)	0.17 - 0.35	5 " 20/ "
Patas (<i>Erythrocebus patas</i>)	0.15 - 0.28	4 " 20/ "

NOTE: The *P. papio* — *P. anubis* transition lies very near the survey area and our field sightings were not definitive. There may be a hybrid zone.



Fig. 5: Author measuring chimpanzee nesting tree (photo by Mana Diakité).

{typo} ... a maximum population for Mali west of the Bafing R. of ca 650. Human ...

and probable quadrats as well suggests that maximum population density is greater east of the Bafing, but there are reported to be several small (isolated?) populations of chimps between the Bafing and Bamako; this might add 50-100 for a total of about 700 chimps in Mali. However, the assumption that population density in Mali is no lower than at Mt. Assirik or Ugalla (Tanzania) needs to be tested. If the density in Mali is lower, the population there is of even greater interest regarding hominoid adaptation to a harsh environment.

We obtained only indirect evidence concerning home range size. During the survey of the proposed Bafing Makana park area we found a number of rotten nests, but few recent ones. We were told that chimps migrate into the hills away from the Bafing River during the dry season, which is consistent with the ages of the nests we found. The minimum length of such a migration would be about 25 km, suggesting a home range of at least 300 km², the range estimated for chimps at Mt. Assirik, Senegal (Baldwin *et al.*, 1982).

Because of the difficulties estimating nest ages, estimates of party size based on associated nests are very crude. Nevertheless it is interesting to note that the largest number of identifiably same-age nests in a cluster was only five; at Mt. Assirik 37% of nest groups had more than 5 nests and almost 20% of groups had more than 10 nests/group (Baldwin *et al.*, 1981). This does suggest that average party size may be smaller in Mali. Whether this indicates a lower population density or not cannot be determined from our data.

Estimated densities for other primates were calculated based on sightings from the vehicle and on foot surveys, using average and maximum perpendicular distance to the path and average and maximum sighting distances. Sample sizes are small (5-10 sightings/species) and

No other primates were seen, though we were told galago are common and in Faraba (the southernmost town visited) hunters said that black colobus can sometimes be found near the Naria River, nearer the Guinea border. It is worth noting that patas were reasonably common in the scrubby *Combretum* woodland; population densities for several open woodland sites are in the neighborhood of 2-8 individuals/km² (Mt. Assirik, C. Henty, unpublished; Laikipia, Kenya, J. Chism, pers. com.; Group II at Murchison Falls, Hall, 1965). Patas are often considered a savanna species, based largely on Hall's account of the overall habitat at Murchison Falls, where patas density may have been as low as 0.04/km². However, their primary habitat may be better characterized as scrub woodland than as "savanna" and conservation planners should probably consider 5 individuals/km² a better "norm" than 0.04/km².

Hamlets are scattered throughout the southwest and most men carry shotguns with them (Fig. 6). No species of mammal, bird or reptile seems exempt from hunting (Figs. 7-9); those not eaten as food are used for magic charms and/or traditional medicine. Skins used for medicine are sold by the piece, and ca .01 m² of chimp skin is worth the equivalent



Fig. 6: Farmers always carry shotguns. Incidental poaching is a serious problem (photo by J. Moore).



Fig. 7: A vendor purchases a patas monkey (*Erythrocebus patas*) head from local people to sell in a Bamako market (photo by J. Moore).



Figs. 8-9: (top) Lion skull, aardvark head and monkey paws among other wildlife artifacts for sale in a Bamako market. (bottom) Various skins for sale in the same market. Arrow indicates a chimpanzee skin (photos by J. Moore).

of several days wages. Elephant, serval, colobus, eagles, python; literally everything from aardvark to zebra was available in Bamako (scraps of zebra skin may have come from a pair that had been at the zoo). It is hard to estimate market turnover and hence impact on species. Over a one-month period, most of two adult chimp skins, half a serval skin, and at least three patas heads were sold at one market. For the more prolific or common species this is probably a negligible rate of use, but for larger carnivores and chimps it could be serious. Two chimps/month would be more than 3% of the estimated Malian chimp population per year.

At this time chimpanzees in Mali are protected only by their resemblance to humans. Most people we spoke with did not approve of eating them, even medicinally (through obviously they are used to some extent). I was told that an isolated group of chimps remains in a small reserve south of Bamako, but according to Eaux et Forêts staff this is not a viable population. Arid-country chimpanzees are primarily interesting for their behavioral adaptation to their habitat. Their ecosystem is unique, and at present there is no area in Mali in which savanna chimps and their habitat are protected. The Parc National du Niokolo-Koba in Senegal contains chimps in similar habitat, but apparently only a single community (Tutin *et al.*, 1983).

There is a large dam being constructed on the Bafing River at Manantali, which is expected to flood some 500 km² by about 1990 (D. Schreiber, personal communication). The Government of Mali is considering the establishment of a new national park just south of the dam, partly to compensate for the lost habitat and partly, as I understand it, in recognition of the low wildlife population surviving in the existing Parc National du Baoulé.

Establishment of the Bafing park would in principle protect the habitat of the northernmost chimpanzees in Mali. There is every reason to believe that the park zone contains part of the most marginal habitat in which a reproducing chimpanzee community exists. During our survey, we were struck by the increase in signs of larger mammals — droppings, hoofprints, etc. — encountered when we entered the proposed area, and it is one of the apparently few areas in Mali where giant eland are known to occur. In addition, the dam will probably create extensive shallows as the lake floods the nearly flat land near the river. This may make the area suitable for waterfowl, which are currently seriously affected by the recurring failures of the annual rains and consequent shrinking of the Niger delta near Mopti. Finally, access to the dam site is excellent, creating the potential for wildlife tourism if animal populations are protected.

Although favoring the creation of the park, the Malian government's resources are being seriously strained by the Sahelian drought. The Bafing park has great potential for research on chimpanzee adaptation to the savanna and, more generally, into the *soudanien* ecosystem itself. International interest and support for the Government of Mali's plans, possibly in cooperation with the existing international Manantali dam project, will play a vital role in realizing this potential.

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Acknowledgements

I am extremely grateful to M. Nampaa Sanogho (Directeur-General, Eaux et Forêts) for his cooperation in making this project possible, and

to Dr. Stephen Cobb, M. Sekou Kanta, M. Hamid ag Mohamed Lamine, Dr. William McGrew, and M. Bourama Niagate for their advice and assistance setting up the survey. Mana Diakite's timely arrival and decision to join the survey greatly enhanced the experience and the results. Mr. B. Heinzenknecht (TAMS) and Dr. Ibrahima Siby (Directeur, PIRT) very kindly made the PIRT report available. I thank the Entreprises de Construction du Barrage de Manantali (ECBM), and in particular M. Dieter Schreiber, for generously providing lodging and transportation. Lou Mazel and Carol Hunsberger put me up in Bamako for far longer than anticipated; "thanks" is inadequate.

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