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Chimpanzees are Close to Extinction in Southwest Nigeria

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Abstract: A survey to assess the distribution and status of chimpanzees in the southwest region of Nigeria was conducted in order to identify areas where effective conservation action could be taken. Seventeen sites in five states were surveyed. Information was gathered through directed searches, using hunters as guides, and through interviews with local hunters, community members and government personnel. Findings suggest that chimpanzees survive at only about half the survey sites, and that the viability of these remaining populations is in doubt. According to interviewees, chimpanzees were present at all the survey sites 10 to 15 years ago. These findings suggest that in southwest Nigeria as a whole, their population size and distribution has sharply declined over the last decade. Recommendations include the formal and effective protection of some of these sites.
Key words: Chimpanzees, habitat loss, logging, hunting, protected areas, conservation

Introduction

Recent genetic evidence on the evolution of chimpanzee populations consistently divide West African chimpanzees into two separate groups, one in the westernmost Upper Guinea forest (*P. t. verus* Schwarz, 1934) and the second further east in Nigeria and western Cameroon, referred to as *P. t. vellerosus* (Gray, 1862) by Gonder *et al.* (2006), although Oates *et al.* (2009) have shown that the correct name is *P. t. ellioti* (Matschie, 1914). The distributional limits of the Upper Guinea and the Nigeria-Cameroon chimpanzees remain poorly understood; mtDNA of hair samples taken from chimpanzees in southwest Nigeria grouped with one subspecies according to some tree building models, but with the other when using other models (Gonder *et al.* 2006). Resolving the evolutionary relationship of southwest Nigerian chimpanzees is important in planning a strategy that can ensure the conservation of representative diversity in the living great apes, but resolving this issue is made difficult because chimpanzees in this region are rare, and samples of their hair and feces are hard to find.

Nigeria is one of fifteen countries scoring highest for primate species richness, nine of which are in Africa (Cowlishaw and Dunbar 2000, in Chapman *et al.* 2006). However, Nigeria also has the largest human population in Africa, approximately half of which occurs in the southern moist forest zone, within the historic range of chimpanzees (Oates *et al.* 2003). Much of the remaining forest habitat is contained within state forest reserves, established during the colonial period to ensure timber supplies and safeguard watersheds. Like many developing nations, Nigeria depends on its natural resources to generate much needed revenue. Combined with a relatively high level of economic development, due in large part to oil revenues, this has led to continuing high rates of uncontrolled forest conversion and natural resource exploitation. In southwest Nigeria, aided by the flatness of the terrain, this has led to highly fragmented chimpanzee habitat.

Dramatic declines in chimpanzee populations have already been documented for *P. t. verus* in Ivory Coast (Campbell *et al.* 2008) and for *P. t. troglodytes* in Gabon (Walsh *et al.* 2003). Limited surveys of southwest Nigeria have been conducted in Ondo State (Agbelusi 1994), at Omo Forest Reserve, Ogun State (Perrson and Warner 2003), at Ise Forest Reserve in Ekiti State (Ogunjemite *et al.* 2005) and on the eastern edge of the Niger delta (Bocian 1999).

The Conservation Action Plan for West African Chimpanzees (Kormos *et al.* 2003) identified the forests of southwest Nigeria as of highest priority for a survey to assess chimpanzee status. Only one small national park in southwest Nigeria, Okomu National Park in Edo State, affords protection to its wildlife, but no wide-ranging primate survey of this region has been conducted since 1982 (Anadu and Oates 1982).

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The 1982 survey concentrated on the white-throated monkey *Cercopithecus erythrogaster* and the forests of Bendel State (now Edo and Delta States). A better knowledge of the abundance and distribution of chimpanzees and other species, the threats to their survival, and the challenges facing conservation policy makers, is vital for the establishment of a realistic and effective conservation strategy. This paper therefore reports on a six-month survey that commenced at the start of 2006 in southwest Nigeria, the main goal of which was to obtain information on key areas where chimpanzees survive in viable numbers, in order to plan for more effective conservation of these areas.

Methods

The survey covered 17 sites (14 forest reserves, one game reserve, one national park, and one privately-owned, former forest reserve) in five states (see Table 1 and Fig. 1). The natural vegetation of most of these sites is lowland moist forest and swamp forest, although the one game reserve surveyed further north fell within the transitional zone between high forest and true Guinea savannah. Termed 'derived' savannah, this habitat was mostly composed of dry savannah woodland as a consequence of anthropogenic changes.

Information was collected through directed searches of each site and, where possible, interviews of local hunters, timber fellers, community members and government personnel. Broad area-reconnaissance surveys of each site were implemented, involving walking slowly and quietly through the forest along existing tracks, such as logging roads and hunting paths. A more systematic methodology could not be implemented because of time constraints and because very little was known about most of the sites, for example, the state and degree of habitat fragmentation of each. Up-to-date maps were not available from the forestry departments. Maps that dated back at least 30 years that show the original logging compartments were available for only a few sites. The amount of time spent at each site varied, but in most cases was limited to just a few days (Table 1). This survey can, therefore, only be considered a rapid assessment. It depended on finding reliable guides, and hunters, who remained suspicious of us, were reticent to act as guides, resulting in the inadequate sampling of some of the sites. Because I was unable to dispel suspicions as to the project's true motives, discussions remained informal (that is, the author did not write down the answers given by guides in front of them or present them with a systematic questionnaire). Hunters were primarily used to direct the author to areas where they had observed chimpanzees previously. The few available maps were also used to focus research on areas where natural forest remained.

I was usually able to confirm the presence or probable absence of chimpanzees (there were only a few exceptions),

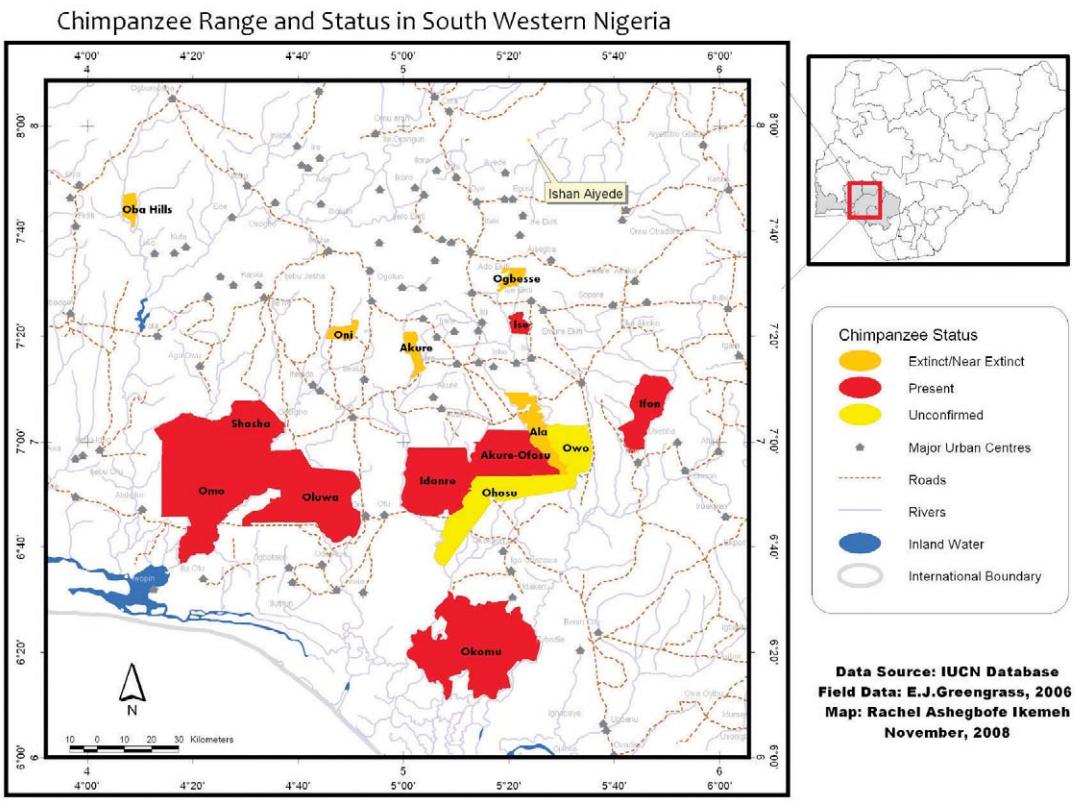

Figure 1. Chimpanzee distribution and status in southwest Nigeria. The former Ologbo Forest Reserve, located approximately 60–80 km southeast of Okomu, is not shown on this map. Note that even where chimpanzees are reported as present, their distribution is patchy due to the fragmentation of their habitat.

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and where present, was able to obtain some information on their distribution and status. Hunters were the best guides, providing the most accurate information, and answering questions related to chimpanzee presence reliably. Observations of habitat quality and the evidence of chimpanzee presence that I collected complemented their information. Abundance was more difficult to assess though, and questions related to abundance were not answered reliably, although habitat quality provided indirect clues to population status.

Confirmation of chimpanzee presence was obtained directly, from sightings, vocalizations and drumming, or indirectly from finding dung piles, discarded food wadges and nests. A Garmin GPS 12 XL was used to record the locations of chimpanzee presence, but it did not work well under the dense forest canopy and as a consequence very few recordings were made. The chances of gathering direct evidence were maximized by camping inside the forest whenever possible, as chimpanzees are most active and most vocal in the early morning and late evening.

Results

There was considerable variation in the quality of the habitat at each site. There is no primary forest left in southwest Nigeria. Larger sites still had blocks of actively exploited secondary forest at their centers, but two of the smaller sites had

Table 1. Inferred status of chimpanzees at different survey sites in southwest Nigeria.

Site	Legal status	Size (ha)	No. of days in the field	Directed search with hunter	No. of nest groups encountered	Other signs	Inferred status
Ondo State							
Idanre	Forest Reserve	54,100	6	Yes	2 (one group of 2 nests, one group of 1 nest)	Vocalization: pant-hoot	Present
Akure-Ofosu	Forest Reserve	40,100	2	No	0	None	Probably present based on hunters' reports and remaining forest cover
Ala	Forest Reserve	19,900	3	Yes	0	None	Extinct / near extinct
Owo	Forest Reserve	24,100	1	No	0	None	Unconfirmed, insufficient information gathered
Ifon	Game Reserve	28,200	2	Yes	0	Food remains	Present
Oluwa	Forest Reserve	82,800	4	Yes	Unknown (5 nests of various ages observed along river)	Sighting of adolescent male; vocalization: food grunt	Present
Akure	Forest Reserve	7,000	2	No	0	None	Extinct / near extinct
Osun State							
Shasha	Forest Reserve	9,000	1	No	0	None	Probably present based on hunters' reports
Oba Hills	Forest Reserve	6,800	5	Yes	0	Vocalization of annoyance	Extinct / near extinct
Oni	Forest Reserve	5,600	1	No	0	None	Extinct
Ekiti State							
Ogbesse	Forest Reserve	7,500	1	No	0	None	Extinct
Ise	Forest Reserve	6,200	6	Yes	2 (5 nests each)	None	Present
Ishan-Aiyede	Forest Reserve	*c.*7,000	1	No	0	None	Unconfirmed, not enough information gathered
Edo State							
Okomu	National Park	21,200	11	National park guide	2 (one group 2 nests, other group 1 ground nest)	Food remains; feces	Present
Ohosu	Forest Reserve	47,100	1	No	0	None	Unconfirmed: not enough information gathered
Ologbo	Privately owned former Forest Reserve	4,000	3	Yes	1 (1 nest)	None	Present
Ogun State							
Omo	Forest Reserve	130,500	7	Yes	2 (each group 1 nest each)	Vocalization: scream; drumming; feces	Present

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been completely converted to farmland, with no natural forest remaining. While eight of the 14 forest reserves, in theory, make up two contiguous forest blocks (the Idanre, Akure-Ofosu, Ala, Owo, Ohosu complex and the Omo, Oluwa, Shasha complex), in reality the remaining natural forest within these reserves is becoming increasingly fragmented and disturbed as a result of unregulated and unsustainable timber extraction practices. Factors affecting the quality of the habitat at each site included their size and their distance from major towns and roads. Southern Nigeria has a well developed road network with some forest reserves traversed by major roads. Illegal squatter farming camps invariably follow logging activity. While these camps may have originated as hunting camps in the recent past, they have now evolved into permanent farming settlements. Hunting activity is prevalent at all the sites but it is the combined influence of all these activities that threaten remaining wildlife populations.

Figure 2. Illegal timber fellers at the former Ologbo Forest Reserve (4,000 ha), Edo State, southwest Nigeria. Today a private reserve. Photograph © Elizabeth J. Greengrass. July 2007.

Figure 3. 'Derived' savannah that has replaced much of the rain forest in southern Nigeria today. These grasslands are the direct result of unsustainable logging and farming practices over an extended period of time. Photograph © Elizabeth J. Greengrass. 2008.

Chimpanzees were confirmed at seven sites based on the direct and indirect evidence collected by the author. Chimpanzees were probably present at two more sites, based on the reports of hunters and the quality of the habitat (see Table 1 and Fig. 1). Chimpanzees were extinct at two sites that had been completely converted to farmland and where no natural forest remained. At three more sites chimpanzees were either extinct or very close to extinction. Forest conversion was such that very little natural habitat remained, and could not have supported more than a few individuals. At Akure Forest Reserve, for example, the only natural forest remaining is the Queen Elizabeth Plot (2–5 km² in size). Despite the proximity of humans, many of whom hunt inside the plot, people reported seeing a chimpanzee on the forest edge on a number of occasions. Chimpanzee-like vocalizations were also heard in one of only two forested gullies remaining at the Oba Hills Forest Reserve. The reserve has been almost entirely converted to plantations and farms, and the persistence of a few isolated individuals may be due only to the species' natural longevity.

By nature, chimpanzees are extremely vocal and come together to socialize in large parties on a regular basis. The pant-hoot, the chimpanzee's long distance call, helps to keep individuals that are not in close proximity in contact with each other. Despite this, however, evidence of the presence of chimpanzee presence and evidence of social cohesion among individuals was rare during this survey. Only at Idanre Forest Reserve were chimpanzees heard to pant-hoot. The largest nest site observed (at Ise Forest Reserve) was composed of only five nests, suggesting that larger social groups were rare or absent. Drumming was heard only once at Omo Forest Reserve (in response to a female's scream when she observed researchers). The paucity of such evidence can be explained by the fact that human pressure and disturbance were severe at six of the seven sites where the presence of chimpanzees was confirmed.

Because this was the first time that most of these sites had been surveyed for chimpanzees, the rate of decline and significance could not be quantified. However, according to interviews with hunters and local communities, chimpanzees survived at all the survey sites 10–15 years ago. This indicates that chimpanzees have disappeared from about half the survey sites within a very short period of time. In southwest Nigeria as a whole their population size and distribution has sharply decreased within the last decade.

Discussion

The rapid decline in the chimpanzee population that this survey identified coincided with a boom in timber production during the 1990s. At this time, new, more efficient sawmills were established, encouraging the timber industry to grow and local economies to become even more reliant on the trade. Most, if not all, timber operations are illegal, unregulated and unsustainable. At one of the survey sites (Ise Forest Reserve) Ogunjemite *et al.* (2005) found that the rate of exploitation was over five times higher than the rate of forest regeneration,

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and logging pressure was intense and increasing. However, the timber industry is highly organized and illicitly supported at all levels of government, and where corruption is institutionalized there is little incentive to correct this. Legitimate companies practicing long-established working plans that were in the majority 30 years ago are now all but absent from the region. The findings of this survey that natural resources in southwestern Nigeria are being over-exploited at an unsustainable rate are not new and have been reported by Agbelusi (1994), Anadu (1987), Anadu and Oates (1982), and as far back as the 1960s (Petrides 1965 in Anadu 1987). Clearly, many wildlife species, chimpanzees included, have been threatened by widespread habitat loss for a very long time.

Figure 4. The broken forest canopy, partly the result of past logging, on the periphery of the Okomu National Park (21,200 ha), Edo State, southwest Nigeria. The forest improves as you travel further into the park and is probably the best example of mature secondary forest in southwest Nigeria. Photograph © Elizabeth J. Greengrass. 2008.

Figure 5. The canopy at the former Ologbo Forest Reserve (4,000 ha), Edo State, southwest Nigeria. The forest in this reserve, now privately owned, is badly damaged, and one of the poorest examples of mature secondary forest in the region. Photograph © Elizabeth J. Greengrass. 2007.

The contribution of hunting to the decline of the chimpanzee population in recent times is less clear, but almost certainly hunting pressure peaked with timber production because threats to primate populations are correlated (Chapman *et al.* 2006). Nowadays, however, hunting appears to have lessened in intensity as a direct consequence of over-exploitation in the recent past. In many parts of southwest Nigeria, hunters do not hunt on a full-time basis. Hunting camps in forest reserves are becoming rare, or have evolved into agricultural settlements. While in the early 1980s, a large proportion of the Nigerian population from all income groups ate bushmeat regularly (reported as 50% by Chapman and Peres [2001] or 80% by Anadu [1987] from the same source), nowadays the consumption of bushmeat is quite rare, at least in the southwest. Some bushmeat is still sold at markets along major roads but the species offered are typically limited to those that persist even under heavy hunting or that also thrive in degraded habitats, such as Maxwell's duiker (*Cephalophus maxwelli*) and the grasscutter or cane rat (*Thryonomys swinderianus*).

While the survey demonstrates the ability of chimpanzees to persist under conditions of high human pressure and disturbance, the viability of these remaining populations is in doubt. Timber trees can contribute disproportionately to the diets of some primate species (Chapman and Peres 2001), indicating that logging has a severe impact by reducing food availability. While chimpanzees do have flexible diets, their energy requirements as large primates with large home ranges predisposes them to a reliance on high energy fruits. Diet quality and feeding efficiency may determine certain aspects of sociability and female reproductive success (Greengrass

Figure 6. Forest cutting and burning by subsistence farmers at the former Ologbo Forest Reserve (4,000 ha), Edo State, southwest Nigeria. Photograph © Elizabeth J. Greengrass. 2008.

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Figure 7. A chimpanzee knuckle print preserved in wet sand along a logging road at the former Ologbo Forest Reserve, Edo State, southwest Nigeria. This picture was taken in May 2008, after active law enforcement had been implemented and loggers were forced to leave. Photograph © Elizabeth J. Greengrass.

2005), and a recent paper showing that core area quality is associated with variance in reproductive success (Emery-Thompson *et al.* 2006) suggests that, by lowering the quality of their habitat, logging pressure may affect the reproductive success of female chimpanzees. A reduction in food availability associated with logging may decrease the animals' condition and increase their vulnerability to disease or parasites (Milton 1996 in Chapman *et al.* 2000) and also increase infant and juvenile mortality. Despite their behavioral adaptability, chimpanzee communities have defined territories that limit the individuals' abilities to avoid widespread human-induced disturbance.

The formal and active protection of some sites through a combination of law enforcement and revenue-generating activities is strongly recommended. While there is scope for the development of a domestic tourism industry, carbon credit schemes may be a more feasible means by which stakeholders in Nigeria can benefit from protecting their natural resources. Since this survey was conducted, further survey work has been carried out in the Omo, Oluwa, Shasha complex (Oates *et al.* 2008) and plans are presently underway for longer-term protection of that area. Since 2007, as part of the Round table on Sustainable Palm Oil (RSPO) initiative, the former Ologbo Forest Reserve has also been protected by a private oil palm company. While the project initially met with a great deal of success in stopping illegal logging, problems related to corrupt logging cartels working in the area that have a large influence at both the local and state level, and the company's failure to recognize the importance of employing a specialist to manage the protected area, will weaken the project in the long-term.

This is the third catastrophic decline in a chimpanzee population documented within the last decade. The severe declines documented for *P. t. troglodytes* (see Walsh *et al.* 2003) and *P. t. verus* (see Campbell *et al.* 2008) in Gabon and Côté d'Ivoire, respectively, occurred in countries that were believed to be the last strongholds for these subspecies. These surveys record a global decline in ape populations over the last two decades that suggest that conservation efforts are not advancing as much as they should. My results suggest that chimpanzees in southwest Nigeria are now on the brink of extinction. Unless effective action is taken, they will be extinct within the next few years in most of the sites where they were found to remain during this survey.

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