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EDITORIAL

LETTER FROM THE SENIOR EDITOR

This issue of *African Primates* focuses on two topics of concern to those involved in the conservation of primates in Africa: the "bushmeat crisis", and the age old question of how to define "species" and "subspecies".

Over the last 5 years or so, and especially during the past 24 months, the hunting of large wild mammals in West and Central Africa has rapidly increased. This activity is now so extensive that it is widely believed to be a greater threat to their populations than loss of habitat. The great apes and forest baboons are particularly affected. The growth of this bushmeat industry in West and Central Africa is closely tied to the expansion of the logging industry.

In this issue of *African Primates*, Tony Rose and Karl Ammann discuss the commercial bushmeat hunting problem and suggest possible approaches to its solution. Several news items in this issue also provide information on bushmeat hunting and its impact.

Evan Bowen-Jones recently completed a comprehensive review of the bushmeat crisis for The Ape Alliance. The report, titled "A Review of the Commercial Bushmeat Trade with Emphasis on Central/West Africa and the Great Apes", provides a detailed introduction to the relationships linking the commercial bushmeat trade, logging, and the survival of populations of great apes and other large mammals. His edited report is included here as a supplement to *African Primates*.

The taxonomy of Africa's primates has always been a subject of much interesting debate. Knowledge of the number of species and subspecies of primates in Africa, their distribution and abundance, is critical to their conservation. Certain taxa are particularly problematic and in need of attention. These include the pottos, galagos, savanna baboons, mangabeys, vervets, and red colobus. Some of the challenges faced by those working on taxonomic questions are presented in a series of notes in this issue of *African Primates*. Esteban Sarmiento and Clifford Jolly discuss current thought on the taxonomy of savanna baboons and the kind of information required to resolve some of this problem.

The front cover of this issue provides the first illustration of a possible new genus and species of potto from Cameroon, Martin's false potto *Pseudopotto martini*. Colin Groves, Simon Bearder and Esteban Sarmiento provide notes that are concerned with *P. martini* and, again, with the question of valid species and subspecies. Further background discussion

on the concept of "subspecies" is provided in two reprinted notes, one on leopards and the other on sturgeons.

This issue of *African Primates* also offers articles and notes on the drill, DeBrazza's monkey, crested mangabey, chimpanzee, pygmy chimpanzee (bonobos), and gorilla.

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Tom Butynski

ARTICLES

CONSERVATION IN CENTRAL AFRICA: TIME FOR A MORE BUSINESS LIKE APPROACH?!

Abstract: In the last decade, the commercialisation of the bush meat trade, in most of Central Africa, has reached crisis level, particularly for the larger forest mammals. The major contributing factors are the development of the road infrastructure which is financed by donor institutions and large logging companies. The conservation community has not been able to counteract this trend. There are no effective measures dealing with the issue at the moment, neither on the micro or macro level.

It is now accepted that this is a crisis. With no answer at hand, it is time to look at new partnerships and new approaches which go beyond the window dressing and lip services which are the order of the day as far as the governments of the region and many of the established conservation organisations are concerned.

The first step might be to develop criteria by which the effectiveness of conservation efforts and 'return on investment' can be measured. In the absence of such criteria, the debate over 'are we winning or losing' will continue to absorb time and energy which should be spent developing new approaches to conservation in Central Africa.

Résumé: Durant la dernière décennie, la commercialisation de la viande de brousse dans la plupart

des régions de l'Afrique Centrale a atteint un niveau de crise, particulièrement chez les grands mammifères forestiers. Parmi les principaux facteurs, un implique la construction de nouvelles routes, construction qui est financée par des institutions de charité et les grandes compagnies de coupe de bois. La communauté de la conservation n'a pu contrecarrer cette tendance. Aucune mesure efficace ne permet de régler le problème en ce moment, ni à petite ou grande échelle. Il est désormais établi qu'il s'agit bel et bien d'une crise. Sans élément de réponse à portée de main, il est grand temps de chercher de nouveaux partenariats et de nouvelles approches qui s'étendent au delà des apparences et du discours superflu et vide de sens qui sont chose courante ces temps-ci, du moins tant les gouvernements régionaux et plusieurs organismes de conservation reconnus sont concernés. Une première étape serait de développer des critères par lesquels il serait possible d'évaluer l'efficacité des efforts de conservation et de s'attendre en quelque sorte à un certain "retour sur l'investissement". Sans ces critères, le débat qui demande si nous sommes en train de "gagner ou perdre" continuera d'accaparer temps et énergie, éléments qui devraient être employés plutôt à développer de nouvelles approches de conservation en Afrique Centrale.

I wonder what would happen if we got Ted Turner, Richard Leakey, and maybe Richard Branson, around a table to discuss the status and problems of conservation in Central Africa with Bill Gates (who took his executives to see the gorillas at Kahuzi Biega National Park in Congo and then returned to honeymoon in Mahale Mountains National Park, Tanzania)? We could give them the bushmeat issue, as a 'case study', and ask them to draw up a 'business-like master plan' to deal with it.

I predict that the resulting document would describe a drastically different approach from current attempts to deal with what is now recognised as a major conservation crisis. Actually, that is surely what is needed! A drastic new approach might well represent the last chance for most of the primates and other wildlife of Central Africa.

To begin with, I should establish my credentials and qualifications for commenting on wildlife conservation and business practices in this part of the world. My educational background is in business. I have a degree in Economics from a Swiss university and one in Hotel Management from Cornell University. I have lived in Africa for over 20 years. During this period, I have twice held Africa-wide positions for a large international hotel-management company. Twelve years ago, I started seriously looking at wildlife photography as a new career option. Today, while still working as a consultant to the tourist industry, most of my time is spent on photography. Taking pictures,

in turn, led me to conservation. For the last 8 years, I have researched the commercialisation of the bushmeat trade, visiting various Central African countries on a regular basis.

Today I see the bushmeat crisis as more than just another story. I am convinced that what is happening on the bushmeat front is symptomatic of events and trends in Central Africa in general. The unsustainable utilisation of wildlife and other resources (such as forests) will lead to more shortages and famine, which in turn will lead to more migration, more social unrest, more war, more starving children on TV screens in the West, and then to additional millions of aid dollars to try and do something about it...so that 'WE' feel better.

I have had the opportunity to discuss bushmeat-related topics with many conservation executives. Coming from a business background, what has surprised me more than anything else, is the lack of evaluative measures in the field of conservation; virtually no attempt is made to establish criteria against which performance can be assessed.

In my hotelier days, I was responsible for properties in several of the countries of concern today. All general managers worked to specific targets and financial budgets. Independent quality assessors would arrive unannounced, with long questionnaires to be answered. Guests were encouraged to send their comments to head office. If management did not live up to expectations, their Africa tours were often short-lived. In countries where even good managers could not produce acceptable results, management agreements were terminated. This is the way business works worldwide.

Many conservation organisations with operations in the countries concerned have budgets similar to those of large hotels, but there seem to be no real targets against which to evaluate the performance of the managers in capital cities, or of field workers out in the provinces.

Take, for instance, the Congo Republique before it degenerated into its present state. It was one of the more organised countries in Central Africa. Several large conservation organisations had offices, even head offices, in the capital, Brazzaville.

I started visiting the Congo regularly in the early '90s, mainly to document the operations of the three great ape sanctuaries there. (Two are for chimpanzees and one is for gorillas. All of them care for dozens of 'bushmeat orphans'). Here are some of the facts and observation I compiled on these trips:

- Bushmeat from a wide variety of species was available for sale in all the major markets, irrespective of whether the hunting season was open or closed.
- While the meat of protected species was disguised in some markets, it was openly displayed in others.

- For a while, elephant steaks, frozen and vacuum packed, were on sale in the capital's most up-scale supermarket chain. (When I questioned the French manager, he told me it had been imported from Chad. He thought that solved the problem. He had never heard of CITES).
- The Prime Minister went on TV, during the closed hunting season, to encourage all school children to spend their holidays hunting and fishing.
- When some concerned individuals in the West responded to the initial publicity by writing letters to the Congo Embassy in Washington they received a reply stating: "There is no poaching problem in the Congo".
- At the Conkouati Wildlife Reserve, we filmed a lorry being loaded with bushmeat, right next to an IUCN vehicle. When we interviewed one of the traders and asked why the cost of the meat doubled by the time it reached the coastal town of Pointe Noire, we were told that the government rangers manning the road blocks would need to be 'paid'. When we asked how much, we were told the more protected the species the higher the price.
- On our first and only evening in Ouessou, the gateway to the renowned Nouabale Ndoki National Park, we filmed a lorry carrying tons of bushmeat, including the carcass of a silverback gorilla. A Western researcher was dutifully recording yet another dead gorilla in his 'bushmeat book'. His job was to assess the sustainability of the trade—not to report it to the authorities or take any significant action.
- The next day, the police chief kicked us out of town, asking us to charter a pirogue to take us to neighbouring Cameroon. He gave us an armed escort who was dressed in a track suit. We assumed this was for our own protection. In the first village outside of town we stopped to load a large bag of ivory, which was to be 'escorted' to Cameroon.
- Two years later, an ABC crew filmed an elephant graveyard halfway between the Nouabale Ndoki National Park and the Odzala National Park. They counted 280 carcasses.
- The Reserve de la Chasse de la Lefini is the largest protected reserve in the Congo. It is also the site where the first group of orphaned gorillas was rehabilitated. I visited twice, and walked for hours in the savannah and forest without seeing any trace of wildlife. The local trackers informed me that there were two hippos left. The last chimpanzees and gorillas had been shot in the 1960s. In this region it was not a question of human population pressure or habitat loss. There is no encroachment. Market hunting for the capital

Brazzaville, some 2 hours away, had resulted in the wildlife being wiped out. With regular flights from Ouessou carrying bags of fresh meat as a main cargo, it is easy to anticipate what this supply and demand will do to wildlife in the longer term, even to the more remote parks and reserves.

- I started to wonder if there was any law enforcement with regard to poaching and wildlife. I asked Dr. Oko, the personal assistant to the Minister, to see the records of poacher arrests. There were none.

This brings me back to objectives and targets. Where is the hope for conservation when poachers and illegal loggers are neither arrested nor lose their licenses? What is the point when the Minister of the Environment eats bushmeat at every official function, and ministry officials rent out guns to poachers to supply the restaurants they own in logging concessions? (This happened in Cameroon, but I am sure the story is not so very different in Congo.) What do you tell a villager who happily suggests that, before you ask him to stop cutting trees or shooting gorillas, that you first go to the capital and stop the wealthy individuals who continue to loot the national resources and economy in a big way. Are all of us who are concerned about the future of wildlife and habitats in Central Africa simply wasting our time and a lot of somebody else's money?

A prominent conservation organisation, to which I offered a bushmeat expose for their in-house publication, wrote back saying:

"The chief drawback, of course, was our firm conviction that publishing your article with your compelling photographs would have wide repercussions that certainly would adversely impact our scientists in Africa. An essential and exhaustive part of their job is to maintain good relations with the governments and indigenous people so that the Society's conservation projects will be permitted to continue."

To me, this says it all. This approach is nothing more than a license to look the other way. For conservation organisations, it is suicidal to admit failure. Only success attracts donations. So let us tell the public about some of our very minor successes. Let us ignore the mayhem and loss around us. Field representatives of large conservation organisations are expected to toe the company line: Maintain good relations. Do not make waves. It is a bad career move to be confrontational.

For example, this need to be associated with success continues to be apparent in mountain gorilla conservation. Half a dozen conservation groups were competing to report increases (real or apparent) in the size of the population of gorillas in the Virunga Volcanoes: 347 apes, 355, now 364, etc. Today, to the best of my knowledge, there is not a single

conservation project that is tackling the bushmeat issue head on. Why? The issue is a sensitive one from the standpoint of politics and economics, the problem is enormous, and the chance of failure, in the eyes of the organisations concerned, is too high. The question that arises is why was the problem allowed to grow to these proportions on their watch?

To bring this back to a business context: If a multinational company ran conservation in Africa, they would set targets first. They would measure the results, and if targets could not be met they would pull out and go to where a return on investment is possible. This would be to where there is political will, or where it can be generated. In hotel management terms, this would be a place where a ministry or a minister who does not pay his bills can be shown the door.

The IMF and other donor organisations regularly pull out of countries, especially if there is no political will. Today they no longer make any bones about it. Currencies collapse and politicians shout, but the tune is called by the person who pays the fiddler.

I have never heard of a conservation organisation quitting a country in a storm of publicity.

Conservation organisations do not criticise each other. This is another unwritten rule. "The quiet, diplomatic approach achieves more than shouting and screaming" is a phrase I have heard over and over again. Is this not just another excuse for looking the other way? The governments concerned like to hide behind the fact that major conservation organisations have hung out shingles in their capital cities. "Where is the problem?"

A letter from the Congo ambassador in Washington states: 'We would like you to know that organism composed of Congolese and international experts (Japanese, British and American) sponsored by the world bank and the planning ministry take care and protect the Congolese wildlife against any danger.'

The facts are:

The rate of loss of habitat, natural resources and species in tropical Africa is now higher than ever before. The quiet, diplomatic approach has failed totally, and a lot of time and money has been wasted.

As for the bushmeat trade: it has now been commercialised to the point where it has become an integral part of the economy. The problem has now gone far beyond the capabilities of the conservation organisations. Even the giant logging companies are powerless to deal with this crisis. One executive of a major French firm told CNN that they were now afraid of the poachers, who had automatic weapons. A German logging company, concerned over the bad publicity resulting from its facilitation of the bushmeat trade, recently asked their timber transporters to tell their drivers to stop carrying bushmeat. The drivers went on strike, and the loggers and transporters capitulated.

The Congo Republique has now disintegrated with

an armed militia declaring war on the government and winning. This is not really surprising considering the amount of illegal weaponry and ammunition employed in poaching alone.

In Gabon, a prominent German logging firm has just started operations in the biologically important Lope Forest Reserve. Cameroon appears to be going the way of the Congo Republique as the conservation situation there continues to deteriorate rapidly. In the DRC, loggers are frantically looking for US\$ 50 million to link the Central Congo River Basin to the logging-road infrastructure of Congo, the CAR and Cameroon. We will then be able to buy bonobo meat in the markets of Douala.

So, who will take action? Who will create the political will necessary to achieve any results on the conservation front?

Mr. Liboz, a prominent French logger in Cameroon, went on camera and stated that what was taking place now was "Total destruction", and that there was no point in counting on the government, the loggers or the conservation community to effect any kind of meaningful change. He felt that only a major international outcry would make a difference.

But, as long as the conservation community needs to publicise its very limited success stories in order to survive, and as long as it insists on the 'quiet, diplomatic' approach, and classifies shocking bushmeat publicity as sensationalising the issue, there will be no such outcry.

Our politicians, as much as any, govern by opinion poll. If the public speaks, the decision makers listen. Ivory poaching, whale hunting and seal clubbing became major issues through public concern. What will it take to turn the large-scale, unsustainable, slaughter of chimpanzees, gorillas and other forest wildlife into a similarly emotional and effective campaign? If we can do nothing for our closest animal relatives, what hope is there for the pangolin and the potto? What does that say about mankind and the future for mankind?

In tropical Africa, the Western donor community is still taken seriously. If large sticks and carrots are our best hope, our best bet is to link donor funding to environmental performance in the same way that human rights issues are linked to donor assistance.

I found it absolutely astonishing some months ago, when the Indonesian economy had to be bailed out with tens of billions of dollars in donor assistance, and every human rights organisation spoke out and asked for severe pressure to be put on the authorities to change. I saw no evidence of environmental groups working to link these huge loans to better environmental performance—and this was while the huge forest fires were still burning. No conservation body took advantage of this opportunity to 'persuade' then President Suharto to cancel the Rice Bowl Project, in which 10,000 km² of prime orangutan

habitat are being cleared for a rice growing scheme (using US\$ 150 million from the National Reforestation Fund)!

How is it that human-rights groups got Senator Ed Kennedy to oppose the loan, while conservationists could not get US Vice President Al Gore to add his piece on the environment?

As a photographer, I will close with a picture (figure 1). This image is the result of a German journalist asking me to illustrate the price difference between bushmeat and domestic meat. We went to the Yaoundé bushmeat market and bought two gorilla arms. We then acquired the equivalent amount in beef. Next, we bought the frozen head of a chimpanzee and matched it with a much bigger pig's head. We took all this back to the hotel and stuck on price tags to illustrate that beef and pork were less than half the price of gorilla and chimpanzee.

This is clearly a question of supply and demand: the supply of great ape meat—and meat from other wild species—to satisfy the taste buds of a growing urban middle class willing to pay a premium for the product. The problem is that this practice is no longer sustainable, and has not been for some time. (Plus it carries a serious health risk for mankind as a whole (e.g., Ebola, HIV/SIV, HTLV/STLV). Increasing demand and decreasing supply will inevitably result in prices going up. With a limited resource, this will go on until the supply is exhausted, which, according to a Polish missionary, will elicit the response: "Why has God done this to us?"

Supply, demand and pricing are the domains of

economists and business people, so why not see what kind of 'solution' they can come up with?

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GROWING COMMERCE IN BUSHMEAT DESTROYS GREAT APES AND THREATENS HUMANITY

Abstract: Commercial hunting of African apes in logging concessions threatens their existence. Conservation strategies and players must expand into a multidisciplinary field of conservation development, which will synergise the relationship between humanity and nature. Recent information in epidemiology will link human health, apes and bushmeat, and will make awareness of the bushmeat crisis global in nature. This complex crisis requires multilevel, interdependent treatment. Three solution clusters are recommended: 1-Fundamental: global alliance for bushmeat education and control; 2-Urgent: multidisciplinary crisis intervention field projects; 3-Sustaining: long-term conservation development programmes.

Résumé: La chasse commerciale des grands singes africains dans les concessions forestières où la coupe de bois est permise menace leur existence. Les stratégies de conservation et les gens impliqués dans cette lutte doivent s'inscrire dans un champs multidisciplinaire plus large du développement de la conservation de telle sorte que les relations entre l'humanité et la nature soient harmonisées. De récentes informations d'ordre épidémiologique feront un lien entre la santé humaine, les grands singes et la viande de brousse et ceci aura pour effet de conscientiser sur cette crise de la viande de brousse. La crise est complexe et requiert un traitement à plusieurs niveaux où les enjeux sont

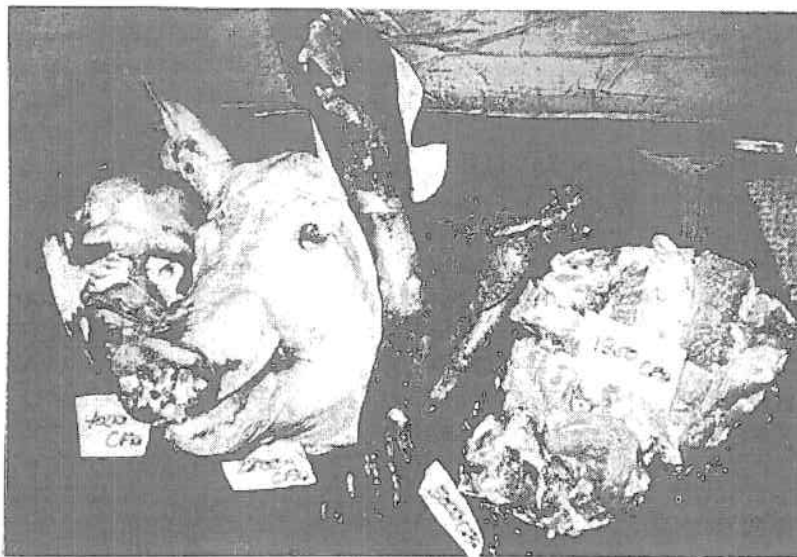


Figure 2. Items purchased in the bushmeat market in Younde, Cameroon (June 1997). Illustrated are the much higher prices paid for a chimpanzee head and gorilla arms than for pork and beef. Both the chimpanzee and the gorilla are endangered species (IUCN 1996). Photo by Karl Ammann.

interdépendants. Trois groupes de solutions peuvent être envisagés : 1- Fondamentale où une alliance globale est mise en oeuvre pour éduquer et contrôler la problématique de la viande de brousse; 2- Urgente dans laquelle sont développés des projets d'intervention de crise sur le terrain; et 3- Durable où sont mis en branle des programmes de conservation à long-terme.

Problem: African Primates are at Great Risk.

Across the forest region of West and Central Africa a conflux of factors are making commercial hunting a leading threat to the survival of many primates, including the great apes. Primate hunting is reported in 27 of the 44 primate study and conservation projects described in IUCN's recent status survey on African primates (Oates, 1996b). In 12 of these territories, hunting by humans is listed as a severe threat to species survival. The latest IUCN *Red List of Threatened Animals* (IUCN, 1996) shows a large increase in threat status for mammal species, with primates being the major order most threatened by extinction. The situation is worse in areas where most remaining apes and monkeys live outside parks and reserves. In these areas, many unique and never-studied primate populations are being annihilated, and more will follow if current trends continue (Oates, 1996a; Rose, 1996; Bowen-Jones, 1998; Ammann, pers. comm.).

The risk level for different species and populations varies with their numbers, reproductive vigour, and distributional range. Past declines have been correlated most with human population growth and habitat destruction, although bushmeat hunting has always occurred (Eltringham, 1984). Now, however, a growing body of evidence shows that shifts in human social and economic practices in the forests of Africa have greatly increased the killing of primates for meat. Oates (1996a) concludes "... while the total removal of natural habitat is clearly a major threat to the survival of many African forest primates, an analysis of survey data suggests that human predation tends to have a greater negative impact on primate populations than does selective logging or low-intensity bush-fallow agriculture."

Primary Cause: Exploitation of Resources by Industrialised World.

The bushmeat crisis has emerged as a direct result of an acceleration in the growth of industrial, extractive commerce in economically poor and politically volatile regions of Africa. People who once manifested spiritual reverence and care for the natural world have begun to view wildlife only as a material resource (Cartmill, 1993). Over a decade ago, Mittermeier (1987) also warned of the pervasive global threat of primate hunting.

Kellert (1996) reported that in much of central Africa "a general pattern of apathy, fatalism, and materialism towards nature and wildlife" prevails. Most contemporary Africans have lost their traditional "theistic" reverence for wildlife and many have taken on the harshest utilitarian view (Mordi, 1991). With the spread of cash economy, colonial religion, and urbanised central government, "tribal values of conserving and protecting non-human life are rendered spiritually inoperable, while new ecological and ethical foundations for sustaining nature have not emerged" (Kellert, 1996). Much of African natural and cultural heritage is vanishing in the chasm between spirit and ethics.

Short-term economic incentives are prepotent in this milieu. A "live for today" attitude prevails. This holds for people struggling to survive, as well as for wealthy Africans. The competition for allegiance favours those who hire and pay local people to support unsustainable and destructive exploitative practices. One timber company executive described it rhetorically: "if you found a 100 franc note lying on the ground, would you pick it up?" (Incha, 1996). Bushmeat is like found money.

There is general agreement among conservationists that the destructive outcomes of bushmeat commerce have reached crisis proportions (Rose, 1996b; Redmond, pers. comm.). What makes this a crisis is not only the numbers, but the way they develop. Juste *et al.* (1995) crystallise the essence of the process: "With the advent of modern firearms and improved communications and transport, subsistence hunting has given way to anarchic exploitation of wildlife to supply the rapidly growing cities with game." The key word here is "anarchic". Horta (1992) wrote that "... almost all the companies in the forestry sector are 'outside the law'. Despite good legislation, there is no effective overseeing of actual operations." It is imperative that international political and financial pressures and incentives be brought to bear on these uncontrolled business activities and the resultant social anarchy. At the same time, work must begin in earnest to expand African people's values beyond the imported view of wildlife and wilderness as an exploitable natural resource.

Secondary Cause 1: Timber Industry is the Catalyst.

Ammann's (1993, 1994a, 1994b, 1996c, 1998) 9-year investigation of hunting pressures in and outside the IUCN-surveyed areas (1996) strongly indicates that unprotected and unstudied apes—especially those within 30 km of the expanding network of logging roads and towns—are being devastated by a burgeoning commercial bushmeat trade. The main catalyst of this devastation is growth of the timber industry (Pearce & Ammann, 1995; Ammann, 1996). Timber prices and profits are tied to

provision of commercial bushmeat to migrant workers. Every logging town has its modern hunting camp, supplied with foreign-made guns and ammunition, and staffed by men and women who come from distant towns and cities, hoping to make a living in the forests (Rose, 1998). With hired indigenous forest dwellers, immigrant hunters comb the forests, shooting and trapping. The consumers are not simply logging camp families, however. The bushmeat trade stretches all the way to fine restaurants and private feasts in national capitals. Little is done to teach or enforce wildlife laws, and there is absence of political will and financial incentive. Gorilla, chimpanzee, and elephant are among the animals that are slaughtered in timber concessions and sold for their meat at prices ranging from two to six times the cost of the beef or pork that is readily available to consumers.

Most timber executives admit there is a problem and say they are powerless to stop it (Incha, 1996; Splaney, 1998). Logging managers have been reluctant to let outsiders into their concessions, fearing that problems will be uncovered and business disrupted with no solutions provided. Nonetheless, a timber CEO recently invited outside investigators to help enforce laws against ape hunting in a million-acre concession in Democratic Republic of Congo (DRC) after seeing photos of seven bonobos smoked and sold for bushmeat (Ammann, in press). Loggers in south-east Cameroon are responding to new documentation of butchered gorillas and smoked chimpanzees, meeting with conservationists to discuss possible action (Ammann, pers. comm.). The timber industry's reliance on bushmeat to feed loggers and their inability to educate workers and govern their concessions leads to indiscriminate hunting, which not only fosters the breaking of laws, but also the breaking of customs. People whose cultural taboos once prohibited eating primates are beginning to try monkey and ape meat (Ammann, 1996c). As eating apes becomes an accepted practice, education and law enforcement becomes more difficult.

For example, south of the Motaba River, Hennessey (1995) studied bushmeat commerce around the Congolese city of Ouessou. He reported that 64% of the bushmeat in Ouessou originated from a single village and that one hunter may have supplied over 80 gorillas per year to the city. Hennessey also estimated that 50 forest elephants were killed annually for meat and ivory in this same study, but only 19 chimpanzees.

Similar hunting and long-distance commercial bushmeat trade is described by Wilke *et al.* (1992) in the Sangha region west of Ouessou. There, many hunters preferred trading their meat at Ouessou for a higher price, rather than at logging concessions, confirming the report of Stromayer & Ekobo (1991) that Ouessou and Brazzaville are the ultimate sources of demand. Wilke *et al.* (1992) mentioned monkey meat for sale, but said nothing about apes. They recommended that wildlife conservation

officers and biologists monitor and protect duikers, primates, and elephants to regulate "the harvest of forest protein".

Pearce & Ammann (1995) reported intense hunting of gorillas and chimpanzees for bushmeat in south-eastern Cameroon, across the border west of Wilke's study site. While some ape meat is sold to logging workers in these forests, most is shipped on logging lorries to the provincial capital of Bertoua and beyond to Yaoundé and Douala where more profit can be made. Ammann (in press) confirmed Hennessey's (1995) findings that a small portion of Cameroon bushmeat crosses the border for sale in Ouessou.

Illegal bushmeat, including gorilla, chimpanzee and bonobo, has been photographed in villages near Lope, Ndoki, and Dja Reserves, and in city markets at Yaoundé, Bangui, Kinshasa, Pt Noire, and Libreville (Ammann, 1996a, 1997, 1998a; McRae & Ammann, 1997). Steel (1994) found half the meat sold in Gabon city and village markets is bushmeat: an estimated \$50 million unpoliced trade. Twenty percent of the bushmeat in that report is primates. More recently in a region-wide review Wilkie and Carpenter (in press) suggest that annual "bushmeat consumption across the Congo Basin may exceed 1 million metric tons." Extrapolating from the above studies, the bushmeat trade across equatorial Africa could be more than a billion-dollar annual business. If logging continues to expand unchecked, the numbers of monkeys and apes killed for the cooking pot will increase.

Secondary Cause 2: Modern Weaponry Allows Even Subsistence Hunting to Threaten Ape Populations.

Demand for chimpanzee and gorilla meat can be substantial, even in areas with no logging intrusion. With the availability of guns, this hunting appears to be unsustainable Wilkie and Carpenter (in press). Kano and Asato (1994) compared ape density and hunting pressure from 29 villages in northeastern Congo Republic and reported that the majority of their informants were willing to eat gorilla or chimpanzee meat. Kano and Asato measured ape population density and asserted that the survival of both ape populations is at serious risk in this territory, as it is farther east for the bonobo, "unless a strong system can be established which combines effective protection with the provision of attractive substitutes for ape meat to the local people." The finding that village hunting of apes in a large habitat area is unsustainable when guns are used causes even more concern about the popular and growing commercial bushmeat trade supported by the timber industry.

Discussion with scores of field researchers and conservationists (Rose, 1996b, c, d; Rose & Ammann, 1996) produced consensus that "if the present trend in

forest exploitation continues without a radical shift in our approach to conservation, most edible wildlife in the equatorial forests of Africa will be butchered before the viable habitat is torn down" (Rose, 1996e). This conclusion had already been reached by Oates (1996a) and has been confirmed most recently by a coalition of the 44 wildlife protection and conservation NGOs in the UK Ape Alliance (Redmond, pers. comm.). Jane Goodall (Bowen-Jones, this issue, pp. S4) declared that "unless we work together to change attitudes at all levels—from world leaders to the consumers of illegal bushmeat—there will be no viable populations of great apes in the wild within 50 years."

Proposed Strategies

Strategy 1: Conservation must serve all of nature, humans included.

Rapid and lasting success will come to innovative conservation educators and developers who work directly with the full range of people involved in expanding human commerce. These inclusive and proactive partnerships will develop socially and ecologically sound programmes to satisfy the human needs that now drive the illegal and unsustainable commercial extraction and consumption of fauna and flora in Africa. Innovators must help human communities in forest, village, town, and city to improve their quality of life by revitalising a synergistic relationship within local and regional ecosystems. Teams of professionals and community leaders will collaborate to convert poachers to game guards, and implement eco-social improvement projects. The study of non-human biology and behaviour will be one of many conservation development services, sustained in the long term by practical interventions to transform human values and effect eco-social accountability.

As further evidence of the importance of synergising ecological and human social factors, changes are occurring that could radically alter the focus of this endeavour. In the past, we have been looking at the explosion of illegal bushmeat commerce as a wildlife crisis. For the apes in particular it has been manifested as a fight against the extinction of our closest living kin. But that genetic kinship is now being postulated to be the source of a crisis that threatens the health of humankind. Medical scientists have recently uncovered evidence suggesting that western African chimpanzees are the original source of the viruses that have propagated AIDS. Bushmeat hunting along each new logging road might bring out more than ape meat. It could transmit new forms of SIV that could further expand the AIDS epidemic.

Virologists have begun to present their evidence in journals (Gao *et al.*, 1999c; Weiss & Wrangham, 1999) and at major international conferences (Hahn, 1999a,

b). They intend to tell the public two things. First, we must stop the hunting and butchering of wild chimpanzees in order to avoid transmission of new strains of SIV. Second, we must launch a programme to study wild apes *in situ*. Biomedical research and action to influence the aetiology and management of these viruses in apes, and in bushmeat hunters and traders, may expose the keys to preventing further spread of HIV and AIDS. The escalation of the bushmeat crisis from a regional conservation challenge to a global health issue increases the complexity of the problem many times over. On every continent people are concerned about the AIDS epidemic. Forms of HIV now coming under control could be replaced by variants that renew the scourge. The chimpanzee virus factor is likely to significantly alter conservation priorities.

Strategy 2: Conservation developers will need more than multidisciplinary competence and vision.

We must gain the aid and involvement of the most wealthy and powerful people and agencies in the world. To succeed in the face of rampant resource consumption and local anarchy, conservation must be guided by five strategic imperatives:

- 1) Social leaders must promote humanity's profound obligation to conserve wildlife and wilderness, and to restore the natural world.
- 2) Political & economic authority must place conservation on par with human rights & welfare.
- 3) Conservationists must go beyond measuring and protecting biodiversity to assuring the synergy of human social systems and natural ecological forces.
- 4) Public demand for intrinsic and spiritual values of nature must overtake utilitarian exploitation and underwrite conservation development.
- 5) All wildlife habitats must be considered sacrosanct, and human intrusion must be managed in a moral, businesslike, and competent way for the global good.

Matrix of Solutions

During 3 years of focus on illegal bushmeat commerce, I have heard and conceived an ever-expanding matrix of solutions to the many elements of the crisis. Ultimately all these elements must be addressed if the destruction and dangers of the bushmeat business are to be reversed. Currently I see 10 parts to the bushmeat crisis agenda—all important. They are listed below in three groups. The first group includes items that are fundamental to initiating solutions. The second deals with areas that need urgent action. The third lists solutions leading to long-term sustainability.

Group 1 (fundamental): Global Alliance for Bushmeat Crisis Education and Control

- A. Bushmeat Campaign Alliance—Organise social change, peacekeeping, and conservation groups, select government agencies, disease research/control organisations, agribusiness, and financial institutions to collaborate to stop the trade in commercial bushmeat and its concomitant adverse effects on apes and other endangered species, local cultures, natural ecosystems, and human health. Only by making the effective treatment of this crisis a requirement for international finance and development in Africa, will the needed changes occur.
- B. African Wildlife Protection Programmes—Endow and institutionalise permanent wildlife protection teams for established parks and reserves, as well as mobile units to work in resource extraction areas. These groups will use community-based preventive techniques, inform people about ecological and health risks, encourage alternatives to bushmeat commerce, and enforce wildlife laws through interdiction and prosecution.
- C. Bushmeat Crisis Campaign—Conduct international campaigns to evoke public concern about the destructive effects of the African bushmeat crisis. Produce books and magazines as well as TV and cinema programmes; finance and organise locally developed radio and newsprint campaigns to motivate protection of apes and other endangered wildlife and to stimulate conservation development in equatorial Africa.

Group 2 (urgent): Multidisciplinary Crisis Intervention Field Projects

- A. Health Monitoring Systems—Design and install methods to study, assess, monitor, prevent and treat interspecies viral and bacterial transmissions in territories where bushmeat hunting and commerce, animal pet and orphan caretaking, and other human contact with apes and other wildlife occurs.
- B. Natural Ecosystem Renewal—Require and enable ecosystem exploiters to become conservation developers to establish bushmeat-free operations, develop effective wildlife and forest protection programmes, provide ecologically renewable products for workers and commercial consumers, and integrate disease and eco-social synergy management into their field operations.
- C. Wildlife Protector Education—Set up projects to recruit, train and re-employ bushmeat hunters as park guards, field assistants, census takers, teachers and bushmeat monitors. Swift reduction

of endangered ape and wildlife killing will come from *in-situ* projects that use hunters' skills and knowledge to support conservation.

- D. Bushmeat Orphan Recovery—Develop and implement projects to seek and safeguard ape bushmeat orphans in hunting camps, homes, businesses, zoos, and sanctuaries, and to employ them in education efforts to engender positive conservation values in local people and communities in regions where wildlife commerce is growing at highest rates.

Group 3 (sustaining): Long-term Conservation Development Programmes

- A. Eco-social Synergy Management—Develop and install mechanisms to restore and maintain synergistic relationships between the natural ecology and human social systems in the widest possible range of primate habitat. Begin with territories where human exploitation threatens life and health of apes and monkeys, humans, and natural ecosystems.
- B. Bushmeat Alternatives—Underwrite and develop alternative protein sources, non-destructive forest product businesses, ecologically sound community gardens and farms, and bushmeat-free markets and restaurants in forest, village, farm, and urban areas where domestic food and economic alternatives are needed most to counter commerce in endangered wildlife.
- C. Mobile Wildlife Missions—Establish mobile training and development projects to travel the religious missionary and public school circuits and help teachers and pastors implement "wildlife missions" to increase awareness of the economic, ecological, and health dangers of the ape and endangered wildlife trade, foster moral and humanistic concerns for living wildlife, and initiate community-based conservation projects.

The treatment of these solutions as a whole can make a difference immediately, and in the long term. Focus on any one item in isolation will eventually fail. Conservationists disagree as to which of the solutions is more important. It is time to accept that all are important; all must be done. And we must do them in collaboration, not in the usual competitive modes. The battles among egos, disciplines, professions, organisations, cultures, religions, and nations must be set aside now. I remain hopeful that this will be accomplished and that we can form and maintain truly effective multidisciplinary teams to confront this complex crisis with the goodwill and competence it requires. The future of apes and other wildlife, equatorial ecosystems, African societies, and human health depends on it.

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discontiguous forest blocks on the mainland and two on Bioko. Commercial hunting continues in all areas, despite the existence of protected areas. The resultant reduction in density and group size may affect reproduction. The Drill Rehabilitation & Breeding Center in Nigeria, initiated and operated by the NGO Pandrillus, has established natural-sized reproductive drill groups (total of 39 wild-born, 33 captive-bred drills) which are kept in electrified forest enclosures. The project's goal is eventual release of groups to the wild; emphasis is currently given to conservation education and promotion of drills and wildlife conservation locally. Pandrillus' associated conservation efforts include protection and gazetting of the proposed Afi Mountain Wildlife Sanctuary which harbours drills, a distinct form of gorilla Gorilla gorilla, chimpanzees Pan troglodytes and other threatened taxa, and small-scale development schemes compatible with conservation goals. Recommendations for further work, both in situ and ex situ, for the drill are summarised.

Résumé: Le drill *Mandrillus leucophaeus* est un des primates d'Afrique les plus menacés, notamment à cause de la chasse, de la perte de l'habitat et de la fragmentation de sa déjà très petite distribution. Aucune étude longitudinale sur le terrain quant à l'écologie et au comportement du drill n'a été entreprise à ce jour. Les résultats sur la distribution et le statut de cette espèce démontrent que l'habitat au Nigéria et au Cameroun est fragmenté en au moins 11 blocs discontinus de forêt sur le continent et deux blocs sur l'Île de Bioko. La chasse commerciale est omniprésente dans toutes les régions en dépit de l'existence d'aires protégées. La réduction de la densité et de la taille des groupes qui en résulte pourrait affecter leur reproduction. Le Centre de Réhabilitation et de Reproduction du Drill, créé et opéré par l'organisme non-gouvernemental Pandrillus, a instauré des groupes biologiquement viables de drills (totalisant 39 drills nés en milieu sauvage et 33 nés en captivité) qui sont protégés dans des enclos forestiers électrifiés. Le but du projet est de relâcher éventuellement ces groupes dans la nature, quoique l'emphasis est pour le moment mise sur l'éducation de la population quant à l'importance de la conservation afin de promouvoir la conservation locale des drills et de la faune sauvage. Les efforts de conservation de Pandrillus incluent, d'une part, la protection et l'indexation d'un sanctuaire proposé, soit celui du Sanctuaire Sauvage de la Montagne Afi qui abrite des drills, une forme distincte de gorilles *Gorilla gorilla*, des chimpanzés *Pan troglodytes* et d'autres taxons menacés ainsi que, d'autre part, des scénarios de développement à petite échelle compatibles avec des objectifs de conservation. Des recommandations pour d'éventuels travaux tant in situ qu'ex situ pour le drill sont énoncées.

THE DRILL—INTEGRATED IN SITU AND EX SITU CONSERVATION

Abstract: The drill *Mandrillus leucophaeus* is one of Africa's most endangered primates—threatened by hunting, habitat loss and fragmentation of its small natural range. No long-term field studies of the ecology or behaviour of the drill have been undertaken. Results of distribution and status surveys show habitat in Nigeria and Cameroon is broken into at least 11

Drills

The drill *Mandrillus leucophaeus*, one of Africa's most endangered and least-known primates, has a natural range of less than 50,000 km² in Cameroon, Nigeria, and Bioko Island, Equatorial Guinea. Drills are the highest priority African primate for conservation action, based on taxonomic distinctiveness and degree of threat (Oates, 1996); sympatry with other threatened primates is also a consideration. What little is known of drill behaviour and ecology mirrors their congener the mandrill *Mandrillus sphinx* (Gadsby *et al.*, 1994; Caldecott *et al.*, 1996). Three factors account for the drill's precarious situation: (i) a highly restricted distribution; (ii) habitat loss and fragmentation within this small region; and (iii) hunting.

Before 1987, the scientific community held drills to be extinct in Nigeria and on Bioko, with the only confirmed population in Cameroon's Korup National Park. This misconception resulted from an absence of information; areas outside Korup had not been investigated and there was no attempt to study the species since the late 1960s (Gartlan, 1970; Gartlan & Struhsaker, 1972). In 1987, the drill's survival in Nigeria was confirmed (Harcourt *et al.*, 1988); at about the same time, their existence on Bioko in two discontinuous forest blocks was documented (Butynski & Koster, 1990). A status and distribution survey of mainland populations was the needed next step for conservation planning.

Survey Work and Results

Due to the large area to be covered and the species' elusive nature, a traditional census was not undertaken. Rather, survey work aimed to determine past and present distribution, population status, threats, and which forests offered the best prospects for the species' long-term survival. Forest blocks were surveyed one at a time, first by road or track to up-date habitat information from maps and to document fragmentation. Next, hunters of all ages were systematically and extensively interviewed in villages closest to the forest for information on drill population patterns, hunting practices, and ecology and behaviour, such as seasonal movements over the past few decades. Hunters were also asked to carefully describe all diurnal primates and their relative abundance. Finally, each forest area was investigated on foot, recruiting as guides the best hunters encountered during interviews.

In 1989-90 we completed survey

work in Nigeria. Drills were reported to be declining in all areas and locally extinct in fringe and outlying forest patches; intense hunting was identified as the cause by nearly all of the hundreds of hunters interviewed (Gadsby, 1990). The Cameroon portion of the survey, a far greater task, was funded as a Fauna & Flora International (FFI) project in 1990. By 1994 we completed survey work for about one-third of habitat areas and cursory work in the rest; the job is thus still uncompleted.

All mainland habitats are being fragmented and destroyed by timber exploitation and agriculture, urbanisation and other forms of rural development. In Nigeria, remaining habitat is fragmented into four forest blocks, two of which are contiguous with habitat in Cameroon (see Fig. 1). Cameroonian habitat (about 70% of total range) is fragmented into at least nine blocks, some, such as Mt Kupe, are smaller than 90 km². This process continues as new logging roads are opened up in Southwest Province, the heart of drill habitat and a part of Cameroon that saw less large-scale exploitation until the past 3 years. Fragmentation isolates drill groups from one another, and existing habitats may become too small to maintain viable populations, regardless of human predation, as they are continually chipped away by small-scale exploitation and expanding agriculture at their edges.

As in Nigeria, drills were reported to be declining in all areas where interviews were conducted. Commercial hunting is more organised in Cameroon, with non-locals hunting intensively in organised groups, moving from one forest area to the next as access improved or areas became hunted out. In Nigeria most hunting is done by individual local men in areas traditionally hunted by their village.

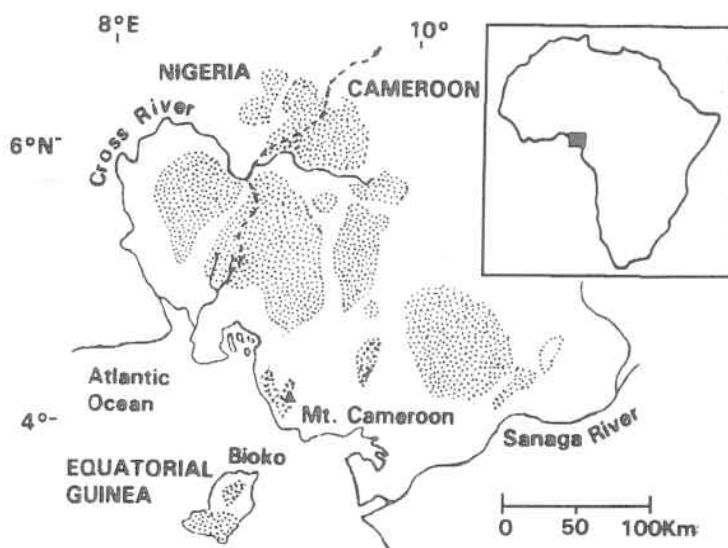


Figure 1. Probable drill distribution showing habitat fragmentation, 1999.

Everywhere drills are hunted for bushmeat. Dogs may be used to track a group and hold it at bay in trees, where several individuals, or even an entire group, can be shot at once. Only mandrills are similarly hunted, as compared to other primates which typically flee, resulting in only 1-2 individuals killed or wounded per group per hunting encounter. The shift over the last 15 years from subsistence to commercial hunting, coupled with a growing human population with ever-increasing cash demands, has brought drill hunting to completely unsustainable levels. The peculiar hunting technique renders drills and mandrills more at risk from intense commercial hunting than other monkeys or apes.

Drills were seldom seen anywhere but it was possible to confirm occurrence of other species, including threatened forms such as red-eared monkey *Cercopithecus erythrotis*, Preuss's monkey *Cercopithecus preussi*, chimpanzee *Pan troglodytes*, and gorilla *Gorilla gorilla*. Other primates, such as crowned monkey *Cercopithecus pogonias* and grey-cheeked mangabey *Lophocebus albigena*, occurred in living memory of older, experienced hunters, well beyond their expected ranges. Close attention was given to identification of primate carcasses for sale but drill were seldom seen, perhaps because it is favoured for home consumption or simply too uncommon. Captive drill orphans were often the only physical evidence of the species' persistence in an area.

In nearly all areas, hunters reported that 'super-groups' were rarely encountered, *i.e.*, younger hunters had never seen super-groups and older men reported not seeing them since the mid-1980s. Super-groups form when two or more groups coalesce for days or weeks. They were typically reported as seasonal and corresponding to certain fruiting periods. This poorly understood behaviour, which is better-documented in mandrills, may be a crucial mechanism for the transfer of individuals and thus genetic material between reproductive groups. If in fact super-groups only rarely or no longer occur, it could imply serious genetic consequences for the species as individuals are not known to emigrate from their natal group. This is based on the fact that the only solitary drills sighted have been old males.

Conservation Measures

Most remaining drill habitat in Nigeria lies within the Cross River National Park in its two separate divisions: Oban (2800 km²) and Okwangwo (920 km²). Cameroon's Korup National Park (1260 km²) is contiguous along 17 km of border with Oban. Protection is notoriously difficult to enforce in the forest and these parks are no exception. Hunters continue to penetrate the parks. The situation is complicated by pre-existing villages in both parks, which have not been resettled as planned. While

international donor assistance for Cross River NP was terminated in 1998, federal authorities are attempting to step up protection efforts. In Korup, a recent management handover to WWF-Cameroon should be cause for optimism. In Banyang Mbo Forest Reserve east of Korup, WCS is working with villages to limit hunting. However, there are no up-to-date primate census data by which to gauge population trends in these protected areas.

Captive Breeding Program

During survey work we observed drills in villages which were captured as infants when their nursing mothers were shot. As drills are also endangered in captivity, with fewer than 60 individuals in zoos participating in the Drill SSP and EEP programs, these orphans were perceived as a valuable genetic and educational resource. In 1991 we founded the Drill Rehabilitation and Breeding Center (DRBC) in Calabar, Nigeria, in cooperation with Cross River State Ministry of Agriculture, Forestry Department and Cross River National Park. The project drew local support from individuals, businesses, media and government, with external support from FFI, the International Zoo Veterinary Group (IZVG), and encouragement from the captive breeding community.

The DRBC now maintains 72 drills (Fig. 2), over 60% of the world's captive population. Animals are recovered by donation from local citizens or after seizure by park authorities or police; no animals are purchased or removed from the wild. The first captive birth occurred in July 1994. To date we have recorded 33 live births to 13 wild born rehabilitated mothers. Survival of full term births is 94%, and 100% are successfully mother-reared. This contradicts long-held beliefs that hand-reared drills were not likely to make good mothers. Wild-born drills are still being recovered. The first births to captive bred drills are expected in 1999. Exchanges and loans of captive bred animals with supporting Drill SSP & EEP institutions are anticipated.

The DRBC is the only purpose-built *in situ* captive-breeding program for an endangered African primate. Among the many advantages of *in situ* projects is the great scope for conservation education and species promotion in a habitat area. The project is open to the public free of charge, 365 days a year, and receives thousands of visitors annually, including school groups. For most, it is their first opportunity to see drills, particularly healthy, breeding animals in natural-sized social groups. Because the long-term success of conservation programs depends on the support of people living in habitat areas, it is essential to stimulate interest in wildlife and an appreciation for endangered species. To foster a sense of pride in Nigeria's natural heritage and the responsibility to protect it, the education program stresses that drills are endemic to this small corner of

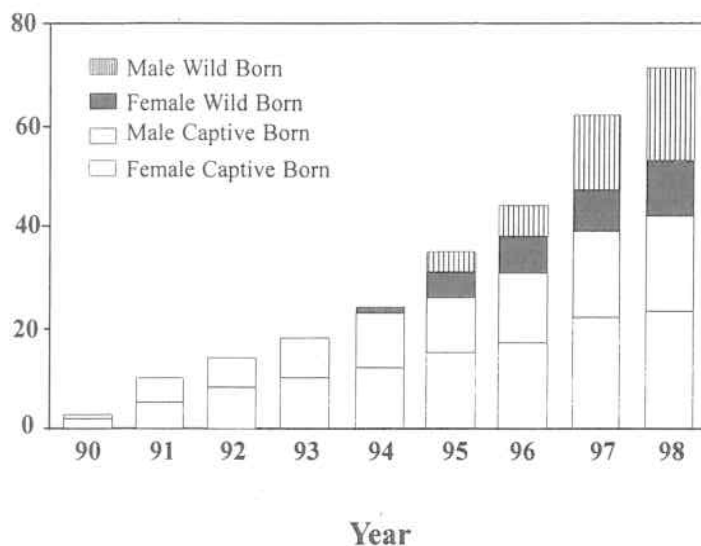


Figure 2. Demographics of drills maintained at the Drill Rehabilitation & Breeding Center, Nigeria (1990-1998). Courtesy of Nancy Harvey, CRES, ZSSD.

Africa. The DRBC also maintains 16 chimpanzees which are popular with visitors.

In 1996, most of the drills and chimpanzees were moved to a new facility in the Afi River Forest Reserve, about 200 km north of Calabar (Figure 3). The animals live in multi-hectare, solar-powered electric enclosures of high forest with natural water sources. Drills and chimpanzees both adapted readily to the forest enclosures, sleeping in trees at night, foraging and utilising all vegetation storeys. The animals are provisioned with local farm produce, and wild fruits and nuts purchased from villagers. The land is part of the Buanchor community forest enclave within the reserve; an annual lease fee is paid to the village. The DRBC employs about 40 persons at Calabar and Afi sites. Capital construction costs were provided by the Whitley Animal Protection Trust (through FFI), and the Landesgirokasse Foundation for Nature and Environment (through Wilhelma Zoo, Stuttgart). A veterinary infirmary, education centre, and permanent housing for staff, researchers and visitors are planned.

With help from an active national media sincerely interested in environmental issues, the project has had success raising the profile of drills, and of wildlife conservation in general, in Nigeria. For example, two drills smuggled from Nigeria and eventually confiscated in the Philippines were repatriated in 1997 (courtesy of Lufthansa Cargo with assistance from the International Fund for Animal Welfare). The press headlined the story, and a popular TV program seen by tens of millions of Nigerians repeatedly aired the film. The drills' story was put forward in a positive way high-lighting government cooperation and sparked editorials

ranging from animal rights to forest conservation. As public interest is critical for long-term success, we prioritise "selling" primate conservation. With Africa's third highest primate diversity, largest human population, and an estimated 94% loss of original forest, Nigeria may be considered a litmus test for conservation. Oddly enough, Nigeria is largely overlooked, sometimes as a matter of policy, by the international conservation community.

The Proposed Afi Mountain Wildlife Sanctuary

The new facility lies at the foot of Afi Mountain (c. 1400m), a canyoned massif comprising about 25% of the

Afi River Forest Reserve (383 km²), where drills, gorillas, chimpanzees and red-eared guenons occur. These drill and gorilla populations are the northwesternmost in Africa. Gorillas in this area, which extends to the Takamanda Forest Reserve in Cameroon, may prove to be a unique form warranting subspecies status

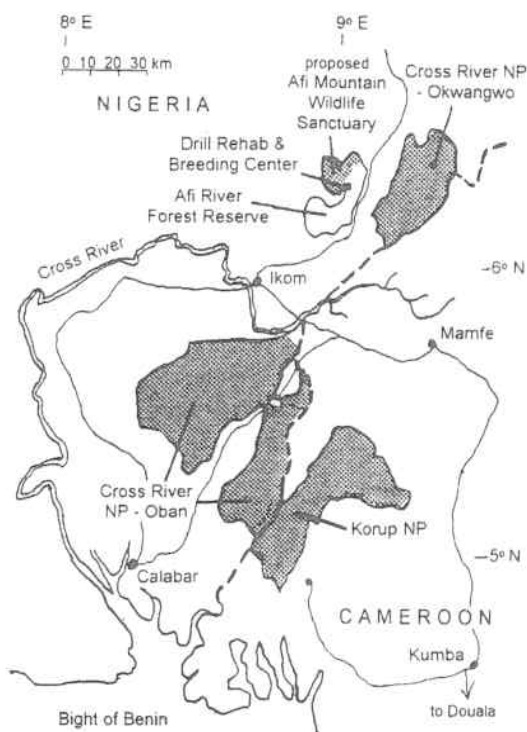


Figure 3. Protected areas of drill habitat in Nigeria and Cameroon showing Korup National Park, Cameroon; Cross River National Park and proposed Afi Mountain Wildlife Sanctuary, Nigeria; and location of the Drill Rehabilitation & Breeding Center.

(J. Oates & K. McFarland, pers. comm.).

The Afi Mountain is too steep for commercial logging and is the sole watershed for dozens of communities; forest to the north and west are lost to derived savannah. In 1993, the project initiated a protection program in 14 villages with traditional hunting rights on the mountain. Hunters from the 'landlord' villages were employed as rangers to patrol the mountain, to promote conservation in their communities and to serve as guides for fee-paying visitors (mostly Nigerian-based expatriates). The scheme produced remarkable results in reducing hunting, particularly shooting of high-profile primates, and won the 1996 Whitley Award. Whitley funds furnished equipment, field costs, training and salaries for the rangers into 1997 and helped develop small-scale tourism. While the communities largely realise that Afi Mountain's wildlife and forests are a valuable and irreplaceable natural resource and their only magnet for international attention, the ranger program was suspended due to local politics.

Fortunately, protection has had a residual effect, reinforced by a gorilla study based on the mountain. It is generally "socially unacceptable" to kill a gorilla, chimpanzee or drill. While a gorilla and two drills were shot in 1998, these were the only known incidents since 1995, and the notorious hunter was apprehended and jailed; such enforcement is unprecedented. The project is now working with the state forestry department to demarcate for regazettement the long-proposed Afi Mountain Wildlife Sanctuary (c. 125 km²). It is hoped that other conservation organizations will become involved to support the forestry department with protection and community extension work.

To bolster support for conservation, the DRBC sponsors a tree nursery (bush mango, ebony, *etc.*), tries to facilitate tourism with revenues for the community, and employs local youths to maintain the community access road and repair bridges. Project education staff visit the Afi communities, fund activities and visits to see the animals for school clubs, and fund workshops to resolve problems associated with uncontrolled farm burning and to devise long-term solutions. Community extension works were funded by the Netherlands Committee for IUCN and the Federal Environmental Protection Agency through a World Bank scheme.

Funding for the DRBC and Afi Mountain have come from many sources, especially small private donors and local assistance in kind. In addition to those already mentioned, major institutional donors include Zoological Society of San Diego, Mobil Producing Nigeria Unltd., Action Rettet den Drill, Zoologische Gesellschaft für Arten und Populationsschutz, Zoofreunde Hannover, International Primate Protection League, Apenheul Primate Park, and others. Donations are received through our Nigerian-

registered trust, Pandrillus (see Figure 4).

Conservation Action

Despite successful *in situ* captive breeding and existence of protected areas, drills remain in a perilous situation with perhaps as few as 3000 individuals surviving on the mainland and 500 on Bioko. To improve chances of preserving viable populations over the long term the following actions are prioritized:

Wild drills:

- Creation of additional protected areas in Cameroon.
- Strengthening existing protected areas in Nigeria, Cameroon and Bioko, and training for staff and management.
- Maintenance and/or restoration of habitat corridors
- Study of agricultural practices to develop proposals to minimise new forest clearing; these may contradict earlier rural development schemes and would require long-term input of expertise and funds.
- Completion and updating of Cameroon survey work.
- Ecological and behavioural studies to illuminate exchange mechanisms between groups, and migration patterns; both would help estimate minimum habitat size.
- Provision of family planning materials and education in cooperation with relevant local government agencies and NGOs.

Captive drills:

- Completion of genetic testing to resolve subspecies question for breeding drills in SSP and EEP: *Mandrillus leucophaeus leucophaeus* (mainland) and *M. l. poensis* (Bioko) drills.
- Preparation for release of drill groups.
- Analysis of minimum viability of wild drill numbers to plan for appropriate release of captive animals to augment critically-depleted wild populations.




If protection proves sustainable and adequate, the project will release a drill group to the new sanctuary where drills are now rare. With major assistance from IZVG since 1992, the captive drills are thoroughly screened and inoculated against common human infections; testing is ongoing. Some members of a release group would be collared and monitoring will be required. Their current behaviour in forest enclosures is perceived as adequate for survival in the wild.

We have tried a multi-faceted approach to drill conservation: basic survey work, *in situ* captive breeding,

THE BIG THREE

THERE ARE ONLY 3 PLACES IN THE WORLD WHERE THE BIG THREE LIVE.

Do YOU know where they are?

DRILL
kising
'sumbo'

GORILLA
echi

CHIMPANZEE
irus

1 9 9 9

JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12
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JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
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Pandrillus

H.E.P.O. BOX 826, CALABAR - NIGERIA

P.O. BOX 878, LIMBE - CAMEROON

THESE ARE THE ONLY 3 PLACES IN THE WHOLE WORLD
WHERE YOU CAN FIND
THE BIG 3:



***THEY
ARE
ALL
HERE!***

1. AFI MOUNTAIN
AFI RIVER FOREST RESERVE
CROSS RIVER STATE
NIGERIA
2. OKWANGWO
CROSS RIVER NATIONAL PARK
CROSS RIVER STATE
NIGERIA
3. TAKAMANDA
FOREST RESERVE
SOUTHWEST PROVINCE
CAMEROON

LET US HELP "THE BIG 3" TO SURVIVE!!

★ DRILL ★ GORILLA ★ CHIMPANZEE ★

Figure 4. Sample of "The Big Three" primate conservation promotional campaign materials by Elaine Scott, Pandrillus.

public education and habitat protection. While the captive program forestalled completion of survey work, we hope it has brought the species needs to the forefront and joined NGOs, local and national Nigerian government services, individuals and the private sector in aid of drill conservation. The primary goal is sustainable protection of existing wild populations, using the captive drills for local conservation education and promotion, and to secure a viable, genetically diverse breeding population.

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Kakamega. Alors que la population est demeurée stable, l'habitat de ces singes subit une grande pression invasive des populations humaines et les animaux sont souvent eux-mêmes victimes d'harcèlement des êtres humains depuis qu'on les retrouve dans les mêmes régions que les babouins Papio anubis qui exploitent les productions agricoles.

DE BRAZZA'S MONKEYS *CERCOPITHECUS NEGLECTUS* IN THE KISERE NATIONAL RESERVE, KENYA

Abstract: *De Brazza's monkeys Cercopithecus neglectus are rare in Kenya. We report on the population of De Brazza's monkeys in the Kisere Forest National Reserve, which is one of only two relatively large populations in the country. Our observations in 1996, along with those made by other researchers in the previous decade, suggest that while birth rates are low, many young survive to sub-adulthood. What happens to sub-adults is unknown, however: they may simply be replacing adults who face high levels of mortality, or they may be attempting to disperse. No new breeding groups have been established in Kisere in 10 years, although solitary males, pairs of animals, and an all-male group were observed. We found no evidence for the presence of De Brazza's monkeys in the main block of the Kakamega Forest. While the population has remained stable, its habitat is under severe threat from human encroachment, and the animals themselves are often victims of human harassment since they are found in the same areas as crop-raiding baboons Papio anubis.*

Résumé: *Les singes de Brazza, Cercopithecus neglectus, sont rares au Kenya. Nous présentons ici nos observations de ceux vivant dans la Réserve Nationale Forestière de Kisere qui font partie d'une des deux seules populations relativement larges du pays. Nos observations de 1996, jumelées à celles conduites par d'autres chercheurs lors des décennies précédentes, suggèrent que plusieurs jeunes survivent jusqu'à l'adolescence et ce malgré que les taux de natalité demeurent bas. Nous ignorons toutefois ce qu'il advient de ces adolescents: peut-être remplacent-ils tout simplement les adultes qui eux-mêmes font face à de hauts taux de mortalité ou peut-être tentent-ils sinon de se disperser. Aucun nouveau groupe reproductif ne s'est établi à Kisere depuis les 10 dernières années quoique des mâles solitaires, des paires d'individus et un groupe uni-mâle ont été observés. Nous n'avons pu trouver aucun indice quant à la présence des singes de Brazza dans la partie principale de la Forêt de*

Introduction

De Brazza's monkeys *Cercopithecus neglectus* are rare in Kenya, occurring in a few isolated areas in the western part of the country. Although they have been reported to occur in the Cherangani Hills, Mt. Elgon, Mt. Kenya and Maralal areas (Wolfheim, 1983), recent surveys have documented mainly isolated groups or single individuals. Only in Saiwa Swamp National Park and in the Kisere Forest National Reserve are multiple groups with adjoining home ranges known to occur (Brennan, 1985; Wahome *et al.*, 1993; Decker, 1995; Mugambi *et al.*, 1997).

In 1985, Brennan reported 28 De Brazza's monkeys in Saiwa Swamp National Park. She counted another 54 individuals distributed among 17 sites outside the park in the Trans-Nzoia area but did not identify these sites. In half of these sites (8/17), only one or two individuals were detected. The implication of Brennan's work was that by the early 1980's, De Brazza's in Kenya were found only in isolated pockets of suitable habitat (riverine forest), whereas a decade or two earlier they had a more continuous distribution (Brennan, 1985). A more recent survey (Mugambi *et al.*, 1997) largely confirmed the disjunct and limited distribution of this species in western Kenya.

Our study followed-up on previous censuses of the population of De Brazza's monkeys resident in the Kisere Forest National Reserve in Western Province, Kenya (34.89°E, 0.4°N; Fig. 1). This 4.6 km² forest island is separated from the larger Kakamega Forest block (178 km²) by about 2 km of populated, agricultural land. The population of 35-40 De Brazza's inhabiting Kisere was overlooked by Brennan's survey, but later discovered by Muriuki and Tsingalia (1992), and more thoroughly investigated by Wahome *et al.* (1993). Follow-up censuses were carried out by Walker (1992), Matsuda (pers. comm., 1993), and Kirathe (1997). Our main goal was to determine the current status of the De Brazza's population in Kisere. That is, was it stable, decreasing or increasing over the last decade, and what are the prospects for its long-term survival?

Kisere Forest is bounded by two rivers, the Nandamaywa on the southeast, and the Isiukhu on the west (Fig. 1). Previous studies of De Brazza's suggest they occur mainly along rivers or in swampy areas (Gautier-Hion & Gautier, 1978; Brennan, 1985). At Kisere the three resident troops of De Brazza's also

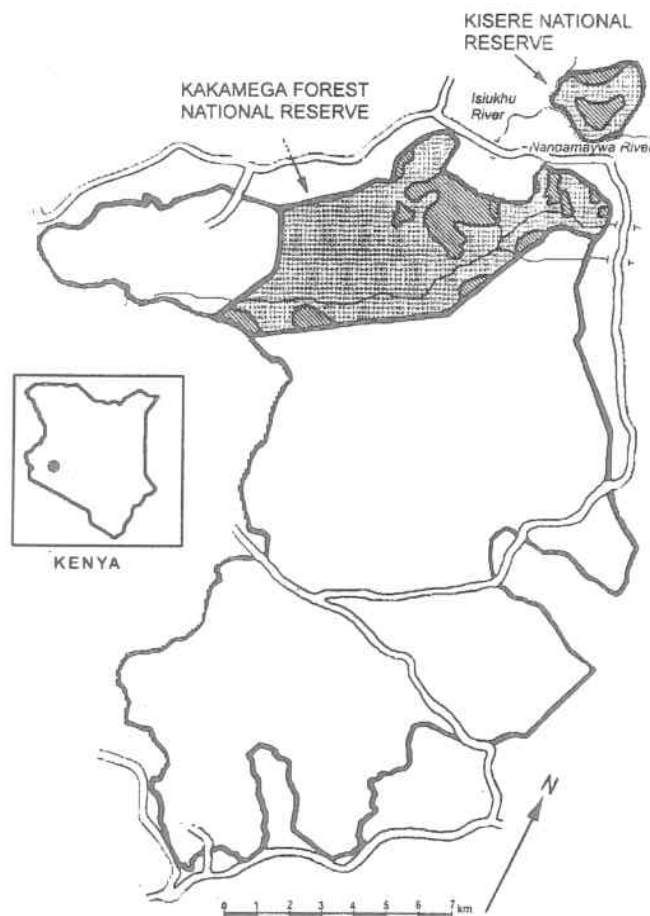


Figure 1. Map of the Kakamega Forest, Kenya, showing the Kisere and Kakamega National Reserves at the northern end.

occur only along the rivers' edges (Wahome *et al.*, 1993; this study). Our observations were made in these areas. Because one side of the river was not in the reserve, and was used for agriculture, it was easy to move along this riverbank opposite the forest where the monkeys lived, and to look into the forest from a slightly elevated vantage point. Observations were made by JC and three field assistants between 11 July and 2 August 1996 and focused on Group C. The monkeys were observed for a total of 58 hours on 13 of 17 days in the field, with complete or nearly complete counts made of group C on 11 of these 13 days.

Results

In 1987-89, Wahome *et al.* (1993) found 40 De Brazza's monkeys living in three groups plus three solitary adult males in Kisere Forest. Here we use Wahome's group designations (A, B, C) to refer to the three De Brazza's groups at Kisere. In 1991, Walker (1992) reported a total of 35 De Brazza's in these groups. She found that while Group A increased in size from 11 to 17 animals, the

other two groups decreased. Group C had only half as many monkeys in 1991 as in 1989, and at least one individual from this group was trapped in 1990. A 3-week survey carried out by Matsuda in 1993 found that all groups had apparently decreased in numbers but the brevity of her visit, combined with the poor observation conditions, make it difficult to interpret these results. In 1996, Kirathe (1997) counted 37 monkeys in the three groups. He found Group A to contain about half as many animals as in 1991, while Groups B and C had about the same numbers as in 1989, increasing in size since 1991.

The number of sub-adults counted in each census, including the most recent one (Table 1), indicates that the population is able to sustain enough young to maturity so that sub-adults are available both to replace their parents as breeding adults and to disperse to form additional groups if sufficient habitat were available. Also, while yearly production of infants appears low, with 3-5 adult females in each group apparently producing about one infant among them (not each) in most years (with 1989 being an exception), numbers of juveniles and sub-adults suggest good infant survival.

Since the three groups of De Brazza's are producing sub-adults which must either join one of the existing groups, form new groups or disperse out of the area, one is led to ask, "What is the fate of these individuals?" Numbers of adults in the three Kisere groups have been remarkably stable over the last 9 years, especially given the high numbers of sub-adult females identified. One possibility is that this apparent stability conceals high adult mortality with adults being replaced by maturing sub-adults. Such high mortality among adults would stand in contrast to what is known about other Kakamega guenons (red-tailed monkeys *Cercopithecus ascanius* and blue monkeys *Cercopithecus mitis*; Cords unpublished). Another possibility is that neither male nor female sub-adults are being recruited into the existing groups. As there is no evidence that they have been founding new breeding groups in Kisere Forest, they may be dispersing. Wahome *et al.* (1993) saw three solitary males in the study area but none has been reported by subsequent observers. We identified a fourth group of De Brazza's in the home range of Group C containing an adult male, a sub-adult and two juveniles of different sizes. This appeared to be an all-male group rather than a new breeding group. We also observed simultaneously two pairs of monkeys in the home range of Group C, each including a juvenile and an adult-sized individual. The adult-sized monkeys were not fully adult males, and the size of the juveniles did not match those of the juveniles in the all-male group. The two pairs were so far from Group C that we consider it unlikely that they be-

Table 1. Changes in the De Brazza's monkey population in Kisere Forest, Kenya (1987-1996). Groups are labeled as in Wahome *et al.* (1993).

Study	Month/ Year	Group	Adult males	Adult females	Sub-adult males	Sub-adult females	Juveniles	Infants	Total
Wahome <i>et al.</i> (1993)	12/87	A	1	3	0	2	5	0	11
	3/89	B	1	3	0	3	6	0	13
		C	1	4	0	2	6	3	16
Walker (1992)	7/91-	A	1	4	1	5	5	1	17
	10/91	B	1	3	1	2	2	1	10
		C	1	4	0	2	0	1	8
Matsuda Pers. comm. 1993	6/93-	A	1	2	2*		2	2	9
	7/93	B	1	2	0*		1	0	4
		C	1	2	0*		4	2	9
Kirathe (1997)	10/95-	A	1	3	0	3	1	0	8
	4/96	B	1	5	1	5	2	1	14
		C	1	4	1	5	3	1	15
This study	7/96	C	1	4	6*		3	1	15
		all- male	1	0	1	0	2	0	4

* Indicates total number of sub-adults when sex of all individuals could not be determined

longed to this group. While sightings like these are consistent with dispersal attempts, they do not confirm successful dispersal. It is possible that mortality is high among sub-adults who try to disperse.

The De Brazza's at Kisere have not been observed far inside the forest but poor observation conditions or the narrowness of the forest corridor might be responsible for this, rather than the habitat preference of the monkeys. At least in Group C's home range, the process of clearing and cattle grazing in the interior of the National Reserve has left only 200 m or less of intact forest along the river's edge. Kirathe (1997) found no major differences in distribution of plant food resources to account for the De Brazza's preference for river edges, but as just noted, there is really only edge remaining in many areas. At the southern end of Kisere Forest the Nandamaywa River joins the Isiukhu River which flows into and through the main block of Kakamega Forest (Fig. 1). Thus, the Isiukhu may previously have provided a route of dispersal for De Brazza's into the Kakamega Forest National Reserve (Tsingalia, 1988). Now the river runs through a densely populated area between the two forests and its banks are cleared of forest and intensively farmed. It is unlikely that De Brazza's are currently able to disperse successfully along this river.

We found no reliable evidence that De Brazza's occur inside the Kakamega Forest National Reserve. This finding agrees with the conclusions of previous studies, and would be expected if successful dispersal from Kisere were impossible. However, assuming similar population

dynamics in the past, it is difficult to explain why such dispersal would not have occurred previously, leading to the establishment of these monkeys in the main block of the Kakamega Forest.

Nothing obvious in the physical structure or plant composition of the forests suggests why De Brazza's should be able to inhabit the forest at Kisere but not in the Kakamega Forest National Reserve. Kirathe (1997) compared the distribution and abundance of De Brazza's plant foods in the Buyangu area of the Kakamega National Reserve and in Kisere and came to the same conclusion. Either there must be other factors that researchers have not yet been able to identify which are responsible for the absence of De Brazza's from other parts of Kakamega Forest, or dispersal away from Kisere has always been difficult, thus preventing successful establishment in new areas. Direct evidence for either of these scenarios is lacking at present.

Conclusions

While the number of De Brazza's in Kisere Forest appears to have been relatively stable over the last decade, there are factors at work in the Forest Reserve which indicate an uncertain future for the long-term survival of this population. These include intensive human use of the forest resources, harassing of monkeys during actual or suspected crop raiding (pers. observ.), and trapping of monkeys either for sale, for

food, or because they are seen as agricultural pests (reports from local people). Local farmers can distinguish between the different primate species when asked to do so. They refer to De Brazza's as "the bearded ones". But they make no distinction when it comes to harassing monkeys by throwing stones or using slingshots on them in response to crop raiding.

De Brazza's are reported to do some minor crop raiding, mostly of avocados and guavas, although we did not observe them to do so. They do not have the destructive potential of a troop of olive baboons *Papio anubis*, however. In July, for example, when maize was ripening, baboons resident in the forest frequently crossed the river to raid the fields. Children are predominantly employed to thwart the baboons' raiding activity. Understandably, children and adults are not too selective about which species they hurl stones at when attempting to drive off crop raiders.

The main effect of human harassment is to disrupt the De Brazza's feeding and ranging behavior for a large part of each day during the maize harvest. De Brazza's are especially vulnerable to this harassment because they forage low in the forest right along the river's edge where baboons are often found. This habit puts them well within range of the stones thrown even by young children. The likelihood of being hit by stones thrown at baboons is increased by the De Brazza's tendency to stay put and hide in the undergrowth rather than to flee through the canopy as other guenons and the black and white colobus *Colobus guereza* do. Thus, the habitat preference of De Brazza's and their alarm response appear to make them more vulnerable to human harassment than are the other monkeys in the forest. All other species of monkey move farther from the river's edge to avoid human activity.

The forest habitat at Kisere appears to be in a very vulnerable state. Where the rivers abut the National Reserve they provide some protection for the forest as farming occurs right up to the rivers' edges but not across the rivers into the forest itself. However, the northern border of the reserve has no river boundary and here human activity, predominantly grazing of cattle and cutting of trees for firewood, encroaches on the reserve (Fig. 1). In addition, a wide path runs through the middle of the reserve. This path is used to bring cattle into the centre of the reserve to graze and as a major thoroughfare for local people traveling from one settlement to another. In some areas the forest has been reduced to a narrow band only 100-200 m wide along the edge of the river while the interior has been almost completely cleared. Cattle graze in these cleared areas, and guava, an invasive alien, predominates. As noted above, the narrowness of the remaining forest may already have an adverse effect on the De Brazza's ability to avoid human harassment and to forage away from the river's edge. Not enough is yet known about the feeding ecology of this population to determine whether this may limit the

monkeys' food sources at certain times of the year.

Despite a determined effort by rangers from the Kenya Wildlife Service (KWS) station at Buyangu charged with patrolling Kisere Forest National Reserve, the distance between these two locations (about 20 km over poorly maintained roads, or a 2 hour walk across country) makes it difficult to maintain adequate surveillance. Local people seemed to have little hesitation about using the National Reserve to collect firewood or graze cattle during our study. Thus, we conclude that the best policy to ensure the stability and protection of the De Brazza's population in Kisere Forest National Reserve is to ensure that the forest is adequately protected so that it continues to provide suitable habitat for this species. Given the limited resources available for wildlife conservation in Kenya, we think that the best strategy for ensuring adequate protection, and one that should be implemented without delay given the fragile state of this forest, is to enforce the laws against grazing cattle and cutting firewood in the reserve. This could perhaps best be done by establishing a KWS Ranger Post in Kisere National Forest Reserve. Over the longer term, however, conservation education and the development of solutions to crop-raiding by baboons will also be essential components of a successful conservation strategy for De Brazza's at Kisere.

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SURVEY OF ENDANGERED PRIMATES IN THE FOREST RESERVES OF EASTERN CÔTE D'IVOIRE

Abstract: A 2 month survey was conducted in selected forest reserves of eastern Côte d'Ivoire in 1997. Specifically, we sought evidence of three endangered monkeys: Miss Waldron's red colobus *Procolobus badius waldroni*, Roloway monkey *Cercopithecus diana roloway*, and white-naped (or white-collared) mangabey *Cercocebus atys lunulatus*. We confirmed the presence of *Cercopithecus petaurista*, *Cercopithecus campbelli*, *Cercopithecus diana*, *Colobus vellerosus* and *Procolobus verus* in at least one of the forest reserves surveyed. The presence of *C. a. lunulatus* is suspected (though not confirmed) in two forest reserves. No evidence of *P. b. waldroni* was found. It is possible that this subspecies has recently become extinct. Poaching, rather than habitat destruction, is the major threat to the primates in eastern Côte d'Ivoire. Without immediate action,

this primate fauna will be eliminated.

Resumé: Une enquête de terrain de 2 mois a été réalisée dans certaines réserves forestières de l'est de la Côte d'Ivoire en 1997. Nous voulions particulièrement vérifier la présence de trois espèces menacées: le colobe rouge de Madame Waldron *Procolobus badius waldroni*, le singe de Roloway *Cercopithecus diana roloway* et le mangabey à collier blanc *Cercocebus atys lunulatus*. Nous sommes en mesure de confirmer la présence de *Cercopithecus petaurista*, *Cercopithecus campbelli*, *Cercopithecus diana*, *Colobus vellerosus* et *Procolobus verus* dans au moins une des réserves forestières que nous avons visitées. Il est possible que *C. a. lunulatus* soit également présent (sans que nous puissions le confirmer toutefois) dans deux réserves forestières. Nous n'avons pu trouver aucun indice quant à la présence de *P. b. waldroni*. Il est possible que cette sous-espèce se soit récemment éteinte. Le braconnage, plutôt que la destruction de l'habitat, est la plus importante menace pour les primates dans la région est de la Côte-d'Ivoire. Sans action immédiate, cette faune des primates disparaîtra.

Introduction

Recent surveys of the Upper Guinea East subregion reveal that three primate subspecies, Roloway monkey *Cercopithecus diana roloway*, Miss Waldron's red colobus *Procolobus badius waldroni*, and white-naped (or white-collared mangabey) *Cercocebus atys lunulatus*, are facing extinction in the forest reserves of southwestern Ghana (Oates, 1993, 1996; Struhsaker, 1993; Struhsaker & Oates, 1995; Whitesides & Oates, 1995, Oates *et al.*, 1996/97). Populations of these primates have historically extended into eastern Côte d'Ivoire: *C. d. roloway* to the Sassandra River, *C. a. lunulatus* to the Comoe River, and *P. b. waldroni* to the Bandama River (Booth, 1958). Prior to this project, the status of these subspecies in the western portion of their range was unknown. In 1996, John Oates proposed a survey of those areas in eastern Côte d'Ivoire believed to contain populations of these primates. We conducted this survey between 10 March and 1 May 1997.

Results

Satellite image photographs (LANDSAT), supplied through Bryan Dickinson of the Ghanaian Forestry Department, were studied to identify forest blocks believed to contain primate populations. Subsequently, we relied heavily on the advice of Dr. Wolf E. Waitkuwait, an ecological consultant to the Societe de Development des Forêts (SODEFOR) working for the

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Four areas were selected for investigation: the Bossematie, Songan, Mabi and Yaya Forest Reserves (Fig. 1).

Surveying began in the Bossematie Forest Reserve (180 km²). Our work there consisted of foot surveys carried out during parts of 6 days in various portions of the reserve. In addition, we spent 2 nights in the reserve with an ecological monitoring team¹. We obtained visual and audible confirmation of two monkey species: Campbell's monkey *Cercopithecus campbelli* and the lesser spot-nosed monkey *Cercopithecus petaurista*. It is likely that two, and perhaps three other species are present in Bossematie. Possible evidence of white-thighed black-and-white colobus *Colobus vellerosus* was found, in the form of *Piptadeniastrum africanum* feeding remains, near where monitors saw *C. vellerosus* the previous week. Three years' worth of data gathered by the bio-monitors also indicate that olive colobus *Procolobus verus* are occasionally encountered in the reserve. The monitors also reported hearing the loud call of *C. diana* once in 3 years (approximately 1 month prior to our arrival). *P. badius* and *C. atys* are absent (table 1).

The Mabi Forest Reserve (510 km²) is located roughly 35 km south of Bossematie. Using methods similar to those employed in Bossematie, 4 days and 3 nights were spent searching for monkeys. We encountered *C. petaurista* and *C. campbelli* (always in association) on many occasions. We conducted interviews and searched restaurants in surrounding villages. We were consistently told that *C. petaurista* and *C. campbelli* can be purchased regularly in local markets. Occasionally *P. verus* and *C. vellerosus* (rarely) can be found in markets and/or restaurants (Caspary,

1994). No evidence of *P. badius* or *C. atys* was found inside Mabi or in the surrounding villages (table 1).

The Songan Forest Reserve (350 km²) is located on the eastern side of the Comoe River adjacent to, and south of, Bettie village. Brief surveys by vehicle revealed that this area (although protected) is heavily cultivated and that virtually no undisturbed forest remains. The existing small patches of forest are essentially islands surrounded by slashed and burned fields, extensive areas of secondary growth and/or dwellings. We found no forest that resembled suitable habitat for monkeys. None of the people we spoke with had seen or heard monkeys in the Songan Forest Reserve for at least 2 years (table 1).

The Songan Forest Reserve is separated from the Mabi/Yaya Forest Reserve Complex (350 km²) by the Comoe River. We believe that the steep banks and thick vegetation lining both sides of the river may act as a deterrent to poachers attempting to gain access to the Mabi/Yaya Reserves from the Songan side. We spent 3 nights in the Songan Reserve overlooking the hills of the Mabi/Yaya Reserve on the opposite bank. In order to survey additional areas inside Mabi, we descended the Songan bank, crossed the Comoe, and climbed the opposite bank. During these surveys, *C. campbelli* and *C. petaurista* were the only primates (indeed, the only mammals) encountered in Mabi (table 1). Despite the difficulty in reaching this forest, we found a number of large, well constructed trails, many ground traps/snares, and large numbers of shotgun shells (I picked up 18 shotgun shells in the first hour of our foot survey). Two poacher camps were found and destroyed during the first day of this survey.

The Yaya Forest Reserve (220 km²) is contiguous with the larger Mabi Forest to the north. Our expectations for locating monkeys here were great due to the relative difficulty in reaching the deeper portions of the forest and because fewer villages surround this reserve. We spent 4 days and 3 nights inside Yaya, confirming (both audibly and visually) the presence of five species of monkeys: *C. campbelli*, *C. petaurista*, *P. verus*, *C. vellerosus* and *C. diana*. Yaya represents the only area where *P. verus*, *C. vellerosus* and *C. diana* were observed (table 1).

Three nights were spent in the village of Malamalasso (also known as Aboisso-Comoe) near the southern extent of the Songan Forest Reserve. Two nights were spent in Kosandji near the southwestern border of Mabi Forest Reserve, and two nights were spent in Bettie village (between the Songan and Mabi Forest Reserves). We questioned many villagers about bushmeat in local markets and restaurants. A recent survey of 40 restaurants in Abengourou and surrounding villages revealed that *C. campbelli*, *C. petaurista* and



Figure 1. Forest reserves surveyed in eastern Côte d'Ivoire (1997).

Table 1: Presence of monkeys in five forest reserves in eastern Côte d'Ivoire (1997).

	Bossematie	Mabi	Yaya	Songan	Ehy
<i>Procolobus badius</i>					
<i>Procolobus verus</i>	+	+	*		+
<i>Colobus vellerosus</i>	+	+	*		+
<i>Cercopithecus diana</i>			*		+
<i>Cercopithecus petaurista</i>	*	*	*		+
<i>Cercopithecus campbelli</i>	*	*	*		+
<i>Cercocebus atys</i>					+

* Presence confirmed; + Presence suspected

P. verus are the only monkeys presently found in the bush meat markets (Caspary, pers. comm.).

In Bettie, we learned of a SODEFOR employee who had kept a monkey as a pet for over 10 years. We visited the man who claimed the monkey had bitten him 4 days earlier, and that he had killed and eaten it. The man informed us that he had rescued the monkey as an infant from poachers in the Songan Forest Reserve. We were shown photographs and identified the monkey as *C. a. lunulatus*.

During a 1 week trip to Ghana, we learned of individuals who regularly hunted in extreme southeastern Côte d'Ivoire. This area is directly across the Tano River (which, south of Ediegouasou, serves as the border between Côte d'Ivoire and Ghana) from the village of Nzulenu. We understand that there is a small patch of forest directly east of the Ehy Lagoon and south of the Kotangna Forest Reserve. It seems that this area is unnamed. We refer to it as the Ehy Forest. Hunters claimed that *C. petaurista*, *C. campbelli*, *C. diana*, *P. verus*, *C. vellerosus*, *P. badius* and *C. atys* can be found here. Time constraints prevented us from visiting the Ehy Forest.

We were presented with a juvenile male *C. d. roloway* which was subsequently confiscated and taken to Ghana's Kumasi Zoo. In addition, we were offered a smoked *C. a. lunulatus* which had supposedly come from the same area as the Roloway (the price was US\$ 3). If *C. diana* and *C. atys* are present in the Ehy Forest, then the possibility is good that *P. verus*, *C. vellerosus*, *C. petaurista* and *C. campbelli* are found there as well.

Discussion

C. campbelli and *C. petaurista* are the most abundant monkeys and perhaps the only species in viable

populations in the forest reserves of eastern Côte d'Ivoire. *P. verus* and *C. vellerosus* can still be found, but at very low densities. *C. diana* and *C. atys* are also present, but certainly not at numbers approaching those necessary for sustainable populations. It is probable that these subspecies will be extinct in the near future. No evidence of *P. b. waldroni* was found. It is possible that this taxon is now extinct.

While it is true that little undegraded forest remains in Côte d'Ivoire (Marchesi *et al.*, 1995), the greatest threat to primates in this region is hunting, not habitat destruction. Indigenous organizations, such as SODEFOR, have slowed and/or stopped the destruction of rainforest in many places throughout Côte d'Ivoire. They do not, however, possess the resources necessary to combat the rising levels of hunting. During our surveys, we regularly heard gun shots. In many areas discharged shotgun shells litter the forest floor. Snare and other ground traps were found easily and often. Our impression is that the hunters and farmers we encountered were surprised by our concern with the forest and its inhabitants. This is particularly unfortunate because forest in some of the more remote portions of the Mabi/Yaya Forest Reserve complex, for example, is undisturbed, resembling the Tai National Park in western Côte d'Ivoire. The forests visited during our survey are essentially unprotected: no armed personnel (*e.g.*, *Eaux et Forêts*) patrol these areas. As a result, the network of trails, even in the remote portions of the forests, is extensive and well traveled. In short, the status of these forest reserves does little to protect them. Without immediate action, all monkeys still present in these reserves will be eliminated.

Summary and Recommendations:

- We observed five species of monkeys in the forest

exaggerate the differences between the two chimpanzees (e.g., de Waal & Lanting, 1997). Nomenclature has become a tool in this ideological exercise.

Since 1992, I have elucidated the historical background of this issue in both personal communications to colleagues and in published papers (Kortlandt, 1992, 1993, 1995). In these, I have briefly expressed why the term “bonobo” is, in my opinion, scientifically unacceptable.

Recently, White (1996) has proposed resolving the controversy by renaming *Pan paniscus* the “gracile chimpanzee” and *Pan troglodytes* the “robust chimpanzee”. This seems an excellent idea. We should all be embarrassed that no one amongst us had put forward this suggestion earlier. It now seems apposite to evaluate the pros and cons of the current alternative vernacular names. Too many researchers are not aware of the facts and background. This review is intended to initiate a fully-fledged open discussion. Hopefully it will eventually lead to some degree of consensus.

Pro “Bonobo”

- In everyday talking and writing, the word “bonobo” is easier to use than “pygmy chimpanzee”.
- When talking and writing about both chimpanzee species, the distinction “chimpanzee vs bonobo” sounds better stylistically than “chimpanzee vs pygmy chimpanzee” or “common vs pygmy chimpanzee”.
- Journalists and TV documentary makers prefer bonobo because it sounds more exotic.
- The (common) chimpanzee is not common nowadays. Calling it common might cause uninformed people to think that the species is not endangered.
- Some colleagues think that *P. paniscus* is not smaller than *P. troglodytes*. At any rate, it is not as much smaller as the word “pygmy” might suggest.
- Some colleagues feel that *P. paniscus* is so different from *P. troglodytes* that it should have an entirely different name (i.e., that it should not be referred to as a chimpanzee).
- Emphasising the difference between the chimpanzee species by employing the term “bonobo” helps provide a stronger identity for *P. paniscus* researchers who are heavily outnumbered by their *P. troglodytes* counterparts.

Contra “Bonobo”

- Names given by discoverers and first describers are generally retained in science, even if they are nonsensical or confusing (e.g. “Greenland”, American “Indians”). The same applies to both Latin and vernacular scientific names in zoology

(e.g. *P. troglodytes* and *Pongo pygmaeus*, the American “mountain lion” and the insectivorous “ant lion”, the Tasmanian “wolf”, the African “wild dog”, the American “prairie dog”). There is no reason to strip Coolidge and Schwarz of the rights and honour due to them historically.

- Ease of pronunciation is not a scientific argument. Ornithologists have no problem with such tongue-twisting terms as “British lesser black-backed gull” and “Scandinavian lesser black-backed gull” which express scientifically-based taxonomic knowledge (subsp *affinis* and *fucus*).
- Binomial vernacular names are current in primatology and in African zoology in general, even when the genera are different (e.g. anubis and gelada baboon, black and white rhino, various hyenas, many antelopes, etc.). Even in the names drill and mandrill, and lion and leopard, the principle is recognisable. Abolishing binomiality conceals both taxonomic and general zoological knowledge—pre-Linnean zoospeak is now 264 years out of date, except with regard to domesticated animals. Current scientific practices should be respected. Alternatively, “*paniscus* chimpanzee” could have been used as a vernacular expression.
- The common ancestor of the two species (from 5–7 million to 1–2 million years ago) which has, until now, conveniently been called the “proto-chimpanzee”, should be renamed the “proto-chimpanzee-bonobo” or the “proto-bonobo-chimpanzee (depending on which species is considered more primitive)—these names are stylistically awkward.
- Renaming is generally an ideologically or politically motivated act. Just think of “negro” vs “black” people, St Petersburg-Petrograd-Leningrad-St Petersburg, Congo-Zaire-Congo, etc. Such motives should not enter into science. In a scientific paper, one would expect that the names of animals are as scientific and meaningful as the rest of the paper.
- Heck (1939) reported that he negotiated intensively and continuously with the dealer for nine days to buy the animals but all this time he “forgot” to ask what the word bonobo meant. “Possibly it is the local species name or the pet name of one of the apes” (translated). An implausible story. He also added that, of the people familiar with “dozens” of African languages and dialects whom he asked, none knew the word. Nevertheless Tratz and Heck (1954), quoting Heck (1939), wrote in a footnote (translated): “Bonobo is the native name of *Pan paniscus*”—a case of faulty memory or dishonesty, we may ask. The word may, in fact, have been a misspelling of the name of the town of Bolobo on the animals’ crate. They were probably shipped from this town since it

was the main centre of the ivory trade on the Congo River until the 1930s. The renaming may simply have been a publicity stunt to raise the status of the Hellabrun Zoo and its director. At any rate, it is a nonsense word. There is no reason to endorse such poor scientific behaviour. We must avoid the use of nomenclature as word-trickery for fund-raising or publicity purposes.

- As already mentioned, Tratz and Heck (1954) proposed raising the taxonomic status of the animal by assigning it its own genus *Bonobo*. No taxonomic arguments were, however, brought forward. It was an attempt at taxonomic kidnapping in zoological systematics. It was also an act of arrogance *vis-à-vis* taxonomy in general, and against the leading American primatologist, H.J. Coolidge, in particular. Scientists should not endorse bad science of this kind, either directly or indirectly.
- In recent years, the renaming has proceeded without consultation of either the Musée Royal d'Afrique Centrale in Tervuren, Belgium, which has the type specimen and the main collection of specimen material, or the Congolese authorities and zoologists who are responsible for ensuring the continued survival of the species. For more than 60 years the Congolese and Belgians have called the species both officially and legally *chimpanzé nain*. In vernacular language the terms "le paniscus" were frequently used in the former Belgian Congo. Foreign interference in renaming an animal of such importance to the nation's natural and cultural inheritance again shows arrogance and a lack of elementary courtesy. Conservationists above all should refrain from such behaviour.
- The taxonomic distinction between the two types of chimpanzee is minimal. Schwarz and Coolidge disagreed whether the animal deserved specific or subspecific status. Earlier authors had overlooked the taxonomic difference, including M. Weber (mentioned above) and Schouteden (1928), the leading expert on the mammals of the Belgian Congo at the time. The main differences are the "paedomorphic" (juvenile) anatomy, the slender build, and the relatively longer arms and legs of *P. paniscus*. Taxonomically, these distinguishing characters are not very impressive. The ecological differences between the two species are also much smaller than usually alleged (Kortlandt, 1995; 1999). Calling the species a "bonobo", instead of giving it a binomial chimpanzee name, is therefore taxonomically misleading, and acts as a smoke screen disguising the true nature of the species. It transforms this chimpanzee into a taxonomic orphan hidden behind a false name by its protective foster parents. Imagine the confusion when zoo visitors are told that what is obviously a chimpanzee is not a "chimpanzee" (*paniscus*), while it remains a "chimpanzee" (*Pan*), even while all gorillas, macaques, baboons, etc., remain gorillas, macaques and baboons despite their differences. Some authors have even claimed (in popular scientific press) that the "bonobo" is more closely related to man than the common chimpanzee. Do they mean that the "bonobo"-human furcation is evolutionarily younger than the chimpanzee-human furcation and that the chimpanzee-"bonobo" furcation is a case of parallel or even convergent evolution? This is, of course, taxonomic demagoguery dressed up in vernacular language. (Incidentally, has anyone ever tried to crossbreed the two chimpanzee species, either naturally, by artificial insemination or *in vitro*?)
- The assertion that *P. paniscus* is not smaller than *P. troglodytes* is apparently based on a comparison with the Gombe chimpanzees (e.g., Morbeck & Zihlman, 1989). The latter are diminutive in comparison with other populations of the species. This is probably because of habitat deterioration and, possibly, genetic drift. Furthermore, the methods of data collection were not consistent and the samples were too small to be statistically significant. For a valid comparison one should try to trace the data on the (200?) *P. t. schweinfurthii* chimpanzees captured in the Epulu rainforest area for F. Stare's polio research programme in the 1950s and '60s. I myself have seen quite a few of them and the adult males look as large as those of any other race. There may also have been some confusion as to the meaning of "size". (A giraffe is taller but an elephant is larger.) For the time being, the conclusion that *P. paniscus* is smaller under comparable ecological conditions seems to stand. Belgians in the colonial era, who were familiar with adults of both species either in or from the wild, agreed on this (pers. comm. around 1960 and Vanderbroek archive). However, size as such is rather an irrelevant argument, except in the context of allometry.
- Admittedly, the social and sexual behaviours of the two species are remarkably different. This, in itself, cannot be sufficient reason for assigning special status to *P. paniscus*. Compare this with the situation where all fossil *Homo* species are called "humans" and "early men", in spite of their even more distinctive social, technological and linguistic differences from us. Social and sexual behaviour is quite unstable in the course of evolution and under different ecological conditions, not only in vertebrates but even in social insects. Many mammals, particularly the carnivores and ungulates, show remarkable social differences within a genus and even within a species. Should the Grevy's zebra be renamed because ecologically and behaviourally it differs from the common zebra

even more than chimpanzees do from one another? The peculiarities of *P. paniscus* may largely be aspects of its paedomorphism. Among mammals, juveniles (as a rule) are more social, less aggressive and more diversified sexually, or "polymorph perverse" in the words of Freud. The high-pitched vocalisations may also, in some respects, be attributed to paedomorphism. Abandoning binomiality in the case of the two chimpanzee species obscures a real zoological problem: why is *P. paniscus* a juvenilised chimpanzee, having a prepubescent body with an adult brain and reproductive organs, and with elongated arms and legs? Masking this problem by means of nomenclature impedes research.

- The taxonomic position and general zoological nature of *P. paniscus* may need to be reconsidered when new research on the chimpanzees of south of the Lukuga, east of the Lualaba and west of Lake Tanganyika clarifies their geographical position and their taxonomic and evolutionary status (Jo Thompson, Primate Society of Great Britain meeting 15/4/96; Jonathan Kingdon, pers. comm.).
- The tactics employed by protagonists of "bonobo" are often far from subtle. The National Geographic Magazine stated that "bonobos [are] often called pygmy chimpanzees" (Linden, 1992, pp. 14 and 16). Once an anonymous referee advised an editor not to publish a paper of mine because I called the "bonobo a pygmy chimpanzee". In another case, an author had to fight with a publisher to retain the term pygmy chimpanzee. This is an inversion of the correct state of affairs. When I submitted a paper to the (American) editor of the *International Journal of Primatology* he answered: "It is the editorial policy [...] to use bonobo in preference to pygmy chimpanzee. If an author were to object to this, I would simply use *Pan paniscus* throughout the paper and no common name." If I were a Congolese I would probably call this US neo-colonialism or cultural imperialism. If I were an American I might call it anti-scientific censorship. Being a European I demand freedom of carefully considered scientific expression. Internationally, it is standard practice that controversies over vernacular names are decided by the national zoological (or mammalogical, ornithological, etc.) society in the country where the species lives. (The International Commission on Zoological Nomenclature deals only with Latin scientific names.)
- Renaming a species creates a dangerous precedent. Firstly, according to a current Congolese language, "bonobo" might eventually be changed to "elya". Then the three subspecies of the (common) chimpanzee might be renamed (from the west to the east) "démoui" or "wodon", "tschego" or "pongo", and "soko" or "sokomutu". Furthermore,

the African lion will become "simba", the African bush elephant "tembo", the black rhino "faru", and so on, at least in East Africa, but elsewhere other names would be used. In Australia a group of ideological activists has even proposed substituting all English animal names with Aboriginal names—in a land with hundreds of native languages and dialects. Australian zoology would become virtually inaccessible to the rest of the world. We Euro-Americans already have enough problems with "deer-elk-moose-eland" terminology and should resist any new source of zoological confusion.¹

- Legal actions by conservationists using the term "bonobo" would be invalid since an animal species called "bonobo" does not exist in Congolese law, nor in the law of any other country, to my knowledge.

Conclusion 1

The name "bonobo" for the pygmy chimpanzee is zoologically misleading and nomenclaturally incorrect because it: (1) obscures the true nature and taxonomic status of the species. Moreover, it (2) has an unpleasant background historically; (3) is used for unsound reasons; and (4) goes against current scientific standards. The words "pygmy chimpanzee", on the other hand, provide a meaningful term, expressing the character of the species as a paedomorphic form of the chimpanzee. Moreover, for more than 60 years, "pygmy chimpanzee" has been the official and legal name in Congo-Zaire-Congo and Belgium. Foreigners should not try to impose alien names on their host countries. The term "bonobo" should, therefore, be dropped from the scientific and conservation literature, unless it will be incorporated into Congolese law. Still, the classical vernacular names "chimpanzee" and "pygmy chimpanzee" remain problematic stylistically.

White's Proposal: "Robust" and "Gracile" Chimpanzees

Quarrels over nomenclature are often emotionally charged and can last for decades, or even generations. For instance, the controversy on "ethology" vs. "animal psychology" (in Europe) or "comparative psychology" (in the United States) that started in the 1930s, and reached its peak in the 1950s, still lingers on to date. It would be regrettable if the same were to happen with the pygmy chimpanzee/bonobo controversy. We should be grateful, therefore, if White's (1996) proposal to rename the two species the "robust" and the "gracile" chimpanzee were to gain general acceptance. In contexts where no confusion is possible, we may continue to talk and write about "chimpanzees" (*i.e.*, both species) as we do about "gorillas", "gibbons", "baboons", etc.,

where we do not use the species name every time we refer to them.

The advantages are manifold. All the pro-bonobo arguments listed above, except one, are covered by the term "gracile". Moreover, it has the additional stylistic advantage that an adjective can also be used as a noun. Furthermore, 13 or 14 of the 15 contra-bonobo arguments can be overcome by adopting the new terminology. The only really serious objection to adopting the term "gracile" is that it strips Coolidge and Schwarz of their priority rights as name givers.

The main advantage is, of course, that the proposed new names provide the most concise and accurate description one can imagine, without prejudice or implication as to their taxonomic status or general zoological nature. (In non-comparative studies, "chimpanzee" can still be used for *P. troglodytes* when there is no chance of confusion.)

Nomenclaturally, re-uniting the two close relatives under a single name will stimulate further research as to why they are different—anatomically, behaviourally, ecologically and evolutionarily. It may also inspire palaeoanthropologists to make comparisons. For instance, the gracile australopithecines are generally supposed to have lived in more open and drier habitats than their robust counterparts. This could and should have been doubted because among humans, chimpanzees and many other mammals, the "pygmies" and graciles inhabit the rain forests or other dense vegetation, while the robust forms tend to occur (at least in part) in more open or mosaic landscapes, and even in open bush- and/or grasslands. Only recently doubts have arisen as to the supposed open-land adaptations of the gracile australopithecines (unpublished).

These issues raise many intriguing questions. Remember, if you will, the so-called foetalisation theory of human ontogeny and evolution (Bolk, 1925). To tackle such problems by means of comparative research, it will be more fruitful to consider *P. paniscus* as a juvenilised and gracile chimpanzee with somewhat lengthened arms and legs than as a quite different kind of creature as emphasised by the name "bonobo".

Conclusion 2

White's proposal solves a real problem. Yet there will be resistance to its adoption. As already mentioned, nomenclature is an emotive subject. A name often serves as a flag, a banner, or a coat of arms. There will be many individuals who prefer to stick to the priority principle and to honour the discoverers—these people will continue to say and write "pygmy chimpanzee". On the other hand, those who study only *P. paniscus* and lack a broader perspective will not willingly give up the symbol of their special identity, *i.e.* the term

"bonobo". Thirdly, comparative researchers will prefer an adequate comparative terminology. Among some Germans, there may be nationalist feelings. Reaching a multipartite consensus is often more difficult than thrashing out a bipartisan controversy. After the books by de Waal and Lanting (1997) and Wrangham and Patterson (1996), the influence of the media and publications (with their preference for the exotic) may have been decisive. At any rate, conservationists should have a significant say in the procedure. Ultimately, it is the Congolese who must make the morally and legally binding decision. The survival of the species depends on them. We foreigners should leave the decision on vernacular nomenclature to them.

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¹ Eland is the Dutch name for the European elk whereas the African "eland" is a large antelope.

NOTES

HUMAN RELATIONS WITH CHIMPANZEES: A PROPOSED CODE OF CONDUCT

In a world increasingly dominated by humans and their needs, no chimpanzee is safe. The efforts made so far to enhance species survival in the wild and individual well-being in captivity have not offset growing human abuses of chimpanzees.

Frustrated by possible failure of mainstream wildlife conservation and animal protection measures to give chimpanzees a better survival advantage, some are suggesting that more might be gained by formulating a "Chimpanzee Bill of Rights" which would grant the species some concrete standing in the human legal arena.

My concern is that an initiative centring on legal standing may raise further barriers in a political climate still too conservative to endorse such radical legislation.

Seeking a less provocative approach that appeals to the human conscience rather than to our legislative system, I prefer to focus on a "Code of Human Conduct" whereby chimpanzees achieve more egalitarian coexistence as members in a global community of sentient beings. The main challenge arises not so much with finding topics to address as with finding words and phrases to convey how chimpanzees are like humans—but are not humans.

Free and captive chimpanzees face different problems in the two settings they occupy. A new code of human conduct must target both situations. The first task, then, is to define these two areas of concern.

Problem I

The chimpanzees living in ever smaller numbers in the range countries of equatorial Africa are being depleted by the dual pressures of habitat destruction and human persecution, with some regional units already extinct and others heading that way at varying rapid rates. The conservation measures enacted to date are not assuring the survival of free chimpanzees.

Problem II

The chimpanzees removed in large numbers from range countries in equatorial Africa, with a high mortality rate caused by destructive capture methods, are incarcerated presently in captive conditions that are mostly unsuited to their needs. Low reproductive rates are linked to poor maintenance conditions and management practices. Care standards adopted to date are not ensuring the well-being of captive chimpanzees. If we retain our egocentric attitudes about nature, exploiting and destroying chimpanzees for purely human gain, our best efforts to save this kindred species will fail. Chimpanzees are not, of course, the only ones standing on the precipice of extinction. Fundamental changes of attitude are essential, in my view, to making solid progress on the other, more pragmatic fronts of wildlife conservation and animal protection where we must win the fight to stem population decline in the wild and to stop individual abuse in captivity. A new code of human conduct may pave the way for these changes.

My proposals for a code of human conduct are outlined below in a set of basic objectives followed by specific propositions. Both reflect my priorities in forging attitude changes about our relationship with

chimpanzees. Others are invited to add or amplify on these points in letters to the editor.

Objective A

There is global recognition of the Endangered Species status of chimpanzees, free and captive, backed by international consensus that (a) the wild population remains threatened by extinction in all range countries so long as the factors responsible for present rates of decline continue to overwhelm conservation measures aimed at enhancing species survival, and that (b) the captive population can be classed as self-sustaining only when it contains a majority of third generation captive-born members in all user countries.

Proposition 1

Unilateral protection of free chimpanzees is urgently needed in a spectrum of habitat zones that preserve both biological and cultural diversity in the wild populations, where all types of land development, including "sustainable" natural resource use, and all forms of direct persecution, such as hunting for bush-meat markets and taking for commercial trade, are, in principle, prohibited entirely or, in practice, restricted within regions crucial to species survival. Range states have an obligation to support international restrictions on trade by imposing legislative controls on local hunting and taking of chimpanzees. Whenever habitat competition by humans becomes contentious in range countries, mutual coexistence with chimpanzees should be emphasised.

Proposition 2

Tourism for commercial gain also poses severe dangers, raising risks of contamination by many contagious diseases common to humans, and must be prohibited entirely in core portions of vital habitats and restricted in all protected habitats, with international and national agencies cooperating to strictly enforce controls.

Proposition 3

A total ban should be invoked on international trade of free-born chimpanzees, with no exceptions granted for supplementing the captive population with wild chimpanzees: a moratorium is recommended on international trade of captive-born chimps for purposes other than publicly verifiable propagation to enhance species survival, or at least until the captive population achieves self-sustaining status.

Proposition 4

Penalties now on the books offer only minor deterrents to dealers and buyers. Substantial fines and sentences, in excess of current penalties and always exceeding the profits to be gained by those perpetrating infractions, must be set to enforce legal restraints

on damaging the wild population and on trafficking in live individuals.

Objective B

Cooperative international support of a global network of outdoor sanctuaries that can provide refuge for all orphaned and unwanted chimpanzees, whatever their origin, and particularly for those confiscated during enforcement of laws that prohibit taking and trading of free-born individuals.

Proposition 5

Range countries in Africa should share the responsibility of supporting free-born chimpanzees after they enter captivity even though they generally lack both the resources and the expertise needed to cope with maintenance of these chimpanzees. Construction and operation of local sanctuaries should be an international responsibility shared by wildlife conservation, animal protection and zoological organizations as well as government agencies.

Proposition 6

Preclude killing of unwanted chimpanzees in user countries, for any reason whatsoever. Each country holding captive chimpanzees should institute a national policy backed by specific plans and budgets to support them for their natural life-spans.

Proposition 7

Countries serving as transit points for shipment of chimpanzees should prohibit passage of all individuals destined for countries which do not operate registered sanctuary programs. To encourage all nations to create sanctuaries, international treaties governing trade in endangered species should be amended to prohibit member states from receiving any wildlife shipments until such time as sanctuary programs are established.

Objective C

Universal acknowledgement that chimpanzees share with humans an array of behavioural, social, communicational, emotional, mental and biological traits, including the capacity to suffer physical pain and psychological trauma, as well as numerous positive experiences, which together demonstrate a close kinship that confers upon each a natural right to coexist on one planet.

Proposition 8

For moral and ethical reasons, in addition to many practical advantages in maintaining eco-system diversity, humans must respect the sovereignty of chimpanzees as a species and the dignity of chimpanzees as individuals, and are further obligated to act in ways that neither endanger the survival of

free chimpanzees nor deprive the well-being of captive chimpanzees.

Proposition 9

While chimpanzees may continue to serve as involuntary sources of knowledge for humans in ways that lead to exploitation of wild populations and abuse of captive individuals, actions often justified on the basis of alleged human gain, the sharing of so many definitive traits entitles chimpanzees to inherent freedoms and intrinsic benefits akin to those humans prize for themselves.

Proposition 10

Chimpanzees, showing qualities and abilities that overlap with humans, merit legal protection beyond what is now granted by wildlife conservation laws and animal protection regulations. Humans, having seized control over chimpanzee survival options and well-being standards, hold responsibility to provide legal redress for chimpanzees whose welfare may be violated in ways warranting court intervention.

Proposition 11

All forms of neglect, privation and abuse, whether physical or psychological, practised by trainers, experimenters, exhibitors or even temporary wards of captive chimpanzees, should be punishable in courts under statutes based on values akin to ones applied to protect human freedom and rights.

Objective D

Worldwide recognition of an obligation to exclude chimpanzees from all types of human exploitation and utilisation which do not directly benefit the chimpanzees themselves, on the dual bases that (1) such uses cannot be reconciled with an international ranking as Endangered Species, and (2) such uses are incompatible with current ethical constraints on placing humans in situations causing physical and/or psychological suffering.

Proposition 12

Chimpanzees should not be utilised for entertainment purposes of any kind, whether profitable or charitable, and strict sanctions are needed to prohibit not only the training of chimpanzees by persons connected with such industries but also the buying and selling, or breeding, of chimpanzees for such frivolous purposes.

Proposition 13

Standards of maintenance and care in all biomedical institutions, where the majority of captive chimpanzees are now confined must, in keeping with their stated aim of producing a physically and

psychologically healthy self-sustaining population, be substantially raised by legal mandate to provide all individuals with optimum living conditions. These are, at minimum, cage size above 400 ft² of floor space and 20 ft height, social housing at all times, trained care-givers to provide daily enrichment activities and materials, and independently funded retirement programs. Any institution failing to comply with these standards should be prohibited from breeding or otherwise acquiring more chimpanzees.

Proposition 14

Standards of maintenance and care in all zoological institutions exhibiting chimpanzees for purposes of public education must, in keeping with the stated aims of conserving the species, exceed the requirements set for biomedical facilities so as to meet the public expectations that endangered chimpanzees should be granted optimum living conditions. All zoological institutions serving the public should be barred by law from selling or donating chimpanzees to (1) any entertainment operation whatsoever and to (2) any biomedical facility.

Proposition 15

Chimpanzees should never be forced to involuntarily enter conditions or situations which humans themselves would not willingly enter under exactly the same terms. The baseline measure for relating to any chimpanzee in captivity must be voluntary participation by that chimpanzee.

Objective E

Commensurate with recognising the species sovereignty and the individual dignity of chimpanzees, there should be no rights of personal or institutional ownership whereby captive individuals can be subjected to treatment as mere property under assorted human laws.

Proposition 16

Personal ownership, most particularly where commercial gain is a motive, cannot be reconciled with philosophical ranking of chimpanzees as an Endangered Species. Private citizens should be prohibited from buying, transporting, keeping and selling, or otherwise gaining autonomous control over, the life and welfare of free-born or captive-born chimpanzees.

Proposition 17

Institutional ownership, even by those dedicated to human education and health, should be prohibited unless (1) they empower groups of humans selected

from the general public to render collective decisions on all issues affecting the lives and welfare of captive chimpanzees, (2) they offer verifiable proof of keeping chimpanzees for the sole purpose of species propagation aimed at countering extinction in range countries, and (3) they comply with the optimum maintenance and care needs of every confined chimpanzee.

Proposition 18

Legal sanctions backed by stiff penalties are needed to bar killing of captive chimpanzees living in any institution, regardless of age or reproductive status, for any reason other than humane euthanasia in publicly evaluated cases that involve pain or suffering beyond known remedies.

Proposition 19

No chimpanzee, free or captive, should ever be the victim of an exchange for monetary or other profit by any person or institution. The buying and selling of a chimpanzee invariably invokes treatment as property, and thereby demeans individual dignity.

Chimpanzees are, by all measures known to humans, sentient and sensitive beings whose qualities and abilities match ours more closely than those of any other living species. I do not consider chimpanzees to be humans, nor do I view humans as chimpanzees, but I do think that each merits equal consideration in the grand scenario of life on this planet. So I hope that some day in the foreseeable future the proposals outlined above will be widely adopted as the guideline for governing human relations with chimpanzees.

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LESSONS IN SELF-MEDICATION FROM GREAT APES?

Investigation of self-meditative behaviour in the African great apes is important for understanding how apes combat parasite infection and other pathogens that affect their health, reproduction and ultimate survival. To date, three general types of self-meditative behaviour have been identified: bitter pith chewing, whole leaf swallowing and geophagy. These behaviours are

thought to assist in the control of parasite infection and related symptoms of gastrointestinal upset. The genus of nematode found to be most closely associated with self-medication in Mahale chimpanzees, *Oesophagostomum*, is known to infect a number of non-human primate species, occasionally humans, as well as pigs, sheep and cattle. While a number of broad spectrum anthelmintics are currently available for the treatment of this and other parasites, growing chemoresistance and the prohibitive costs of such drugs make their use impractical if not at times impossible in African nations.

Recently, great interest has been taken in looking for new and alternative anthelmintics using natural plant products derived from ethnomedicine to curb human suffering and economic loss. The study of self-medication in great apes too can be expected to aid in this effort.

A multinational, multidisciplinary collaborative of scientists, The CHIMPP Group (see International Primate Directory), are involved in one such study. The anti-helminthic potential of *Vernonia amygdalina* and a variety of other plants collected in Tanzania, Zaire and Cameroon has already been documented. Many of these are used in traditional African ethnomedicine and are cultivated on the edges of gardens or collected from areas of secondary growth around villages. The group has begun to verify the wider pharmacological potential of some plants and to consider the usefulness of methods employed by great apes in the control of nematode infection in humans and livestock living under similar conditions in the tropics.

A project scheduled to start in the spring of 1998, involves collaboration between Michael Huffman (director, The CHIMPP Group), Tanzanian Universities (Department of Veterinary Sciences, Sokoine University of Agriculture and Department of Zoology-Herbarium, University of Dar es Salaam) and The Danish Centre for Experimental Parasitology (Copenhagen). Promising great ape medicinal plant species available in Tanzania will be collected and tested in Denmark. Once complete, the details of how to use those species deemed effective will be disseminated to local government and regional authorities, and to international primate sanctuaries, such as those run by volunteers of the Jane Goodall Institute, and zoos throughout Africa where the plant material is readily available or can be grown and harvested nearby.

For conservation education purposes, information on self-medication in great apes has already been incorporated into the Jane Goodall Institute's Roots and Shoots' travelling chimpanzee museum program since 1994. A similar use of information is being planned for community conservation and tourist education programs in Tanzania in collaboration with the Mahale

Mountains Wildlife Conservation Society (Dar es Salaam), and the Mahale and Gombe National Parks.

Detailed knowledge of the medicinal plant flora included in the great ape diet is important for community conservation policy planning of buffer zones around national parks and other protected great ape habitats threatened by human encroachment. Public education and application of the scientific knowledge for livestock and captive primate parasite control programs where great ape species exist is a positive and unique approach to raising local awareness of the intrinsic value of these endangered primates and the necessity for protecting them and their natural habitat.

[source: The CHIMPP Group]

PRÉCISION DE LA SITUATION DU CHIMPANZÉ (*PAN TROGLODYTES VERUS*) EN GUINÉE BISSAU: UNE ENQUÊTE EN COURS

Introduction

Parmi les 11 espèces de mammifères menacés en Guinée Bissau (Féron et al., 1997), le chimpanzé *Pan troglodytes verus* et l'éléphant *Loxodonta africana cyclotis*, inscrits à l'annexe I de la Convention de Washington, sont particulièrement en danger.

Les données récentes de la littérature sur les chimpanzés de Guinée Bissau sont pour l'instant fragmentaires et contradictoires. Ainsi, le Guide de la Biodiversité de la Guinée Bissau (WCMC, 1991) mentionne que le chimpanzé est éteint dans le pays. Cette information est reprise dans la Liste Rouge des Espèces en Danger (IUCN, 1996). Pourtant, des publications récentes (Limoges, 1989; Teleki, 1989; Gippoliti & Dell'Omo, 1995) mentionnent la présence de chimpanzés en Guinée Bissau.

Observations

Pour l'observateur résidant en Guinée Bissau, le chimpanzé n'est pas un animal très rare et des rencontres imprévisibles sont fréquentes notamment sur les routes nouvellement ouvertes et / ou goudronnées du sud du pays. De même, les touristes peuvent observer des groupes de chimpanzés dans la forêt de

Cantanhez (Féron, 1996; Tiniguena, 1997). Enfin, de jeunes chimpanzés sont encore proposés à la vente à Bissau et de nombreux individus sont observables au zoo du Ministère de l'Agriculture et chez des particuliers (observations personnelles). Avec les informations disponibles dans Limoges (1989), il est possible de dresser une carte provisoire de l'aire de répartition possible du chimpanzé en Guinée Bissau : sa superficie serait d'environ 7.000 km².

On peut penser que cette population, la plus occidentale d'Afrique, est en voie de fragmentation par les effets conjugués de la disparition de ses habitats préférentiels et de la géographie particulière de sa partie Ouest, caractérisée par un découpage en péninsules et estuaires. Les péninsules, elles mêmes découpées en "sous péninsules" difficiles d'accès pourraient représenter à court terme les derniers refuges de sous populations de chimpanzés qui seraient alors isolées les unes des autres.

Avant d'envisager la pertinence de la réalisation d'activités de protection de la population de chimpanzés dont la capture et la chasse sont interdites par la loi, et d'identifier les pistes prioritaires à suivre pour un éventuel Plan National de Conservation, la Direction de la Forêt et de la Chasse et le Bureau de l'UICN ont mis en chantier une enquête afin de clarifier les points suivants :

- la distribution actuelle de l'espèce, sur la base de la connaissance des villageois vis à vis de la présence/absence des chimpanzés,
- les techniques et circuits de captures et de commercialisation et l'estimation des quantités d'animaux capturés,
- les relations entre les populations locales et les chimpanzés.

Méthode

Une petite équipe a visité plusieurs fois la zone probable de répartition du chimpanzé. Des enquêtes systématiques sont effectuées dans les villages situés sur les routes accessibles en voiture. Une attention particulière est apportée aux villages proche des limites de l'aire de répartition afin de les préciser. Une fiche d'enquête accompagnée d'une photographie d'un chimpanzé est utilisée pour obtenir les informations suivantes : identification de l'espèce (absence de queue, cri, nom local); nom et coordonnées géographiques du village; connaissance de la présence ou de l'absence de chimpanzés sur le terroir du village; direction (notée avec une boussole) et distance approximative des groupes les plus proches; comportement des villageois à l'égard des chimpanzés (hostilité, indifférence ou respect); connaissance des techniques de capture; consommation éventuelle de viande de chimpanzés.

Les informations géographiques sont intégrées dans un Système d'Information Géographique (Mapmaker) afin d'établir une carte de présence / absence des animaux. Cette carte, sera superposée à la carte de végétation obtenue par image satellite, afin de soustraire toutes les zones où la présence de chimpanzés est considérée comme impossible (rizières, mangroves, villes).

Conclusion

Nous sommes toujours à la recherche de littérature indiquant des densités de chimpanzés dans des milieux de forêts, savanes et palmeraies semblables à ceux que l'on peut trouver en Guinée Bissau afin de pouvoir, à terme, donner un ordre de grandeur de la population du pays.

Il a été possible de consacrer un budget de 1.000 USD à ce travail dont les résultats seront disponibles au cours du premier trimestre de 1998.

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BIRTH OF A WILD GORILLA

William Betunga is a park ranger/guide in Bwindi Impenetrable National Park, Uganda. On his 551st visit to the gorillas, on 13 November 1997 he, two trackers and a group of four tourists witnessed the birth of a gorilla to Nyabutono, a female in the Katendegere group, a group comprised of three individuals. Here is Mr. Betunga's account of the birth:

"After removing a few leaves in our way, we saw gorillas clearly. I knew that Nyabutono was pregnant. Normally, she is very shy and it is difficult to get good views of her. Today was a rare sighting. Nyabutono, Kacupira (the silverback) and Kasigazi (the juvenile) were together just sitting and not eating. The silverback quickly turned towards us, looked at us for 5 minutes and relaxed, leaning against a tree with the other two sitting about 1.5 m from him. The silverback occasionally glanced down the slope to where Nyabutono was sitting. This attracted my attention. I could tell she was putting on a strange face and she appeared to be having difficulty in what she was doing. I saw her pull something that looked like an intestine from her vagina, eat it and lick her hands several times. I told the trackers that she was in labour but they didn't believe me! She continued touching her arms and private parts, licking the hands and continually changing position, lying down on her sides and stretching her body. This continued for about 40 minutes after our arrival. She even tried to eat some leaves but only half-heartedly. At times she would stand up on her hind legs and spread them and even use one arm to open her bottom as wide as possible. As the labor progressed, she laid down some leaves on the ground and the silverback started to come closer, occasionally glancing at us. He moved close enough for the female to put one hand on his shoulder and the other on a branch. He put his arm around her waist from behind and rested his hand on her stomach. In this position she was obviously bearing down, the strain on her face showing, though there was no audible sound. In actual fact, the only noises throughout were the occasional grunt/growl from the silverback - even that was at low volume and could hardly be heard 10 m away.

After only a few minutes in this position, she used one hand to reach down and remove the baby as it appeared. She was almost sitting on the ground as she gave birth but was holding herself up a bit with her arms. Soon after this she moved quite quickly towards the juvenile, threatening him, although he remained close by. She then folded over some fern leaves, at the spot where he had been, to make a crude nest and sat in it. She pulled out something that I thought was the placenta and started eating it and licking her hands. She picked some fern leaves and put them between the baby and her stomach and rested the baby on them. She then moved closer to the silverback who was near us and started licking all parts of the baby, turning it all over. The juvenile came closer and licked the baby. He was very curious to see it. The silverback was, meanwhile, also taking a close look at his first-born.

The baby arrived at exactly 11:30 h, about 40 minutes after we had arrived. Throughout the birth, the group was close together and there was no feeding or moving. After 50 minutes of watching we decided to leave the group on its own, but before we left we gave the baby a new name- Magoba, which means 'profits'.

Unfortunately, the infant died only 3 weeks after it was born. Only scant remains were found, so it was not possible to determine its sex.

William Betunga

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ELEPHANT DUNG : A FOOD SOURCE FOR THE CRESTED MANGABEY *CERCOCEBUS GALERITUS*

Elephant *Loxodonta africana* dung mainly contains fibrous material and fruits (e.g., Alexandre, 1978). Here we report on observations showing that elephant dung is exploited by crested mangabey *Cercocebus galeritus*, a semi-terrestrial monkey. These observations were made in the Parc National d'Odzala (PNO) (0°23'-1°10' N; 14°39'-15°11' E) in the Republic of Congo. This park harbours a large elephant population (Fay & Agnagna, 1991). The frequency of dung is particularly high in clearings that elephants visit to drink and to eat salt, and on trails leading to clearings. A mean of one dung pile every 27m was observed on elephant trails (Vanleeuwe & Gautier-Hion, 1998).

The first observation was made near Ekania (1°2' N; 15°3' E) on the Mambili River. A *C. galeritus* was observed searching through an elephant dung pile (although it was not possible to establish why). The second observation was made in the Mbouébé clearing near the Lekoli river (0°3' N; 14°5' E) where we watched a group of 10 *C. galeritus* for 20 minutes. The animals moved about in all directions in search of dung piles. The monkeys searched through the dung with their hands. On finding a fruit they seized it, sat down, held the fruit in both hands, opened the 1 mm thick woody shell with their front teeth, and crushed the single olive-sized seed within. In this case, the fruits were those of *Strombosia pustulata* (Olacaceae).

Usually, only soft, immature fruits of *S. pustulata* are eaten by forest monkeys (e.g., Gautier-Hion, 1980). We suggest that passage through the elephant digestive tract softens the mature fruit, making the nut more accessible. Indeed, in view of the abundance of *S. pustulata* in the forests which surround the observation sites, it is difficult to explain why *C. galeritus* would move into the open where both leopards *Panthera pardus* and spotted hyenas *Crocuta crocuta* occur (pers. obs.) if there were no advantage in this behaviour. Contrary to colobus *Colobus guereza*, and gorillas *Gorilla gorilla gorilla* (pers. obs.), *C. galeritus* were not observed to feed on vegetation in clearings.

In addition to *C. galeritus*, four mammal species, blue duiker *Cephalophus monticola*, red duiker *Cephalophus callipygus*, bush buck *Tragelaphus spekei* and red river hog *Potamochoerus porcus* (pers. obs. and F. Magliocca & S. Querouil, pers. comm.) in PNO move into clearings to eat the seeds of four different fruits found in elephant dung. White (1995) reported that red river hog, mandrills *Mandrillus sphinx*, African civets *Civettictis civetta*, and squirrels search through elephant dung for seeds and insects in Gabon. Though passive ingestion of insects was possible, direct observations indicate that monkeys searched selectively for seeds.

The elephant is considered a key species in the regeneration of tropical forests (e.g., Alexandre, 1978; White *et al.*, 1993). It remains to be learned to what extent fruits in elephant dung are used by primary consumer mammals, and to what extent mammals, acting as post-dispersal seed predators, limit seed dispersal rates.

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- spines on the neck vertebrae (third cervical to second thoracic). It differs from the potto in its less broadened snout, in details of the skull and teeth, especially the very long upper first premolar (resembling the fork-marked lemur *Phaner furcifer*) and very reduced third molar, and in some quite marked postcranial features: it has a long tail (the incomplete tail of the type specimen appears to have 15 vertebrae, whereas the potto illustrated by Schwartz (1996) for comparative purposes has five or six), the neck vertebrae are much less elongated and the second cervical vertebra is not modified at all, the humerus has an entoepicondylar foramen, and the styloid process at the distal end of the ulna is less hooked (suggesting greater mobility of the wrist). It is small in size, at the lower end of the size range of pottos.
- While the skull could be mistaken for that of a potto (and the specimen was catalogued as a potto in the museum), and its modified hand and neck spines ally it to the potto and angwantibo *Arctocebus calabarensis*, some features suggest that it is primitive compared to both potto and angwantibo—neither of these, for example, possesses an entoepicondylar foramen, and the position of the lacrimal fossa in *Pseudopotto* (inside, not outside, the anterior margin of the orbit) recalls *Nycticebus*. Its possession of a long tail implies that the tail may have been shortened independently in the African and Asian lorises, and the less hooked shape of its ulnar styloid suggests that this is another feature in which Asian and African slow-climbers have converged.
- Is it just an odd-looking potto? If it differed from other pottos in only one feature, this would be feasible; but it has a long list of differences. Also, Schwartz (1996) identified a second specimen, the skull of a juvenile from Cameroon (exact locality unknown), also in the Zürich collection, which possesses the same cranial and dental oddities.

PSEUDOPOTTO MARTINI: A NEW POTTO?

Pseudopotto martini Schwartz, 1996, is a newly described genus and species of potto, or potto-like primate. The generic name means "false potto", and the specific name honours the well-known primatologist Bob Martin, who is Professor of Anthropology at the University of Zürich-Irchel.

The type specimen is the complete skeleton of an adult female (which formerly lived in Zürich Zoo and was said to have come from "Equatorial Africa") in the Anthropologisches Institut und Museum, University of Zürich-Irchel. Like the potto *Perodicticus potto* it has a fairly broad muzzle, forward-looking orbits, a reduced index finger and somewhat lengthened

Schwartz (pers. comm.) searched the records of Zürich Zoo but could find no further information on the animal, and no photograph is known of it when alive. The false potto is evidently a fairly rare beast; the Zürich collection has only two specimens, but over 30 of *Perodicticus* (which, incidentally, Schwartz and Beutel (1995) divide into five "morphs", which they suggest are probably different species!). No other specimen is known, or at least has so far been identified, in any other collection. We do not even know precisely where it lives, except that it is reportedly somewhere in Cameroon.

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PSEUDOPOTTO: WHEN IS A POTTO NOT A POTTO?

The naming of a new genus of potto (*Pseudopotto*), based on two museum specimens, highlights the problem of how we recognise and name 'cryptic' species and genera (see the preceding two notes in this issue on *Pseudopotto martini*). Cryptic species are those animals that museum taxonomists find hard to tell apart but which actually have different specific mate recognition systems, for example, many owls, bats, rodents, frogs and crickets (Vbra, 1985).

The slow-moving African pottos (*Perodicticus*) and angwantibos (*Arctocebus*) are among the most cryptic of all primates, being extremely secretive and quiet. However, as with their Asian counterparts, the slow and slender lorises (*Nycticebus* and *Loris*), it is becoming increasingly clear that superficial similarities mask more fundamental differences that have passed unnoticed (Bearder, 1987). Although tradition dictates that there is just one species in each genus (*P. potto*, *A. calabarensis*, *N. coucang* and *L. tardigradus*), a more critical look is beginning to reveal some striking local differences. Are these peculiarities merely intra-specific variations, or are we dealing with an array of species that cannot interbreed, some of which have had a sufficiently long history of isolation to justify separation at a generic level, as in the case of *Pseudopotto*?

Parallel studies of galagos (or bushbabies) by the Nocturnal Primate Research Group at Oxford Brookes University, suggest a way forward. Galagos are the sister group to pottos in Africa. They are well known for their loud calls which penetrate the forest at night and help to distinguish between species that look almost identical (Bearder *et al.*, 1995). Populations of galagos with distinctive call repertoires also vary systematically in details of their hard anatomy (skulls and limb bones), soft anatomy (reproductive organs, arrangement of hand and foot pads and hair structure), behavioural ecology (diet, habitat use and social

structure), and biochemistry (mitochondrial DNA sequences, chromosome arrangement, *etc.*).

Thirty years of research on galago diversity leads us to estimate that there could be up to 40 galago species in Africa, of which less than half have been studied and named so far. Sound proves to be a useful diagnostic feature for galago taxonomy since it is an important means of attracting the opposite sex. It follows that those species which rely mainly on scent to locate their mates will be much harder to distinguish, including the pottos, other members of the family Lorisidae, and many other nocturnal mammals (Bearder *et al.*, 1996).

Returning to the case of pottos, close inspection of photographs in the wild and records of animals in captivity point to some interesting divergence. For example, some separate populations of pottos have different gestation lengths. Tail lengths vary from about 4 cm (an almost invisible stump) to some 30 cm (approximately the same length as the head and body), with gradations between these two extremes in different parts of Africa. Even short-tailed pottos can look very different from one another when seen side by side. Two individuals of unknown origin, confiscated separately at Schipol airport, Netherlands, and then housed together, showed an obvious contrast; in one the eyes were large and protruding whereas in the other they were relatively small and sunken.

Some taxonomists now recognise two species of angwantibo (*Arctocebus calabarensis* and *A. aureus*) (Groves, 1989), and there is serious doubt over the number of species within both the slender and slow loris genera. We are convinced that an appropriately rigorous taxonomic study of pottos, using the multidisciplinary approach outlined above for galagos, will reveal further species. It is perhaps time to move away from the limitations of our own sensory specialisations and recognise that similarity in outward appearance can be profoundly misleading as an indication of species. More rigorous and fine-grained studies are required to show what is actually there—a rich array of nocturnal primates and other mammal species that have been largely ignored.

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THE VALIDITY OF "PSEUDOPOTTO MARTINI"

Schwartz (1996) recently described a new genus *Pseudopotto martini* on the basis of the partial skull and the "essentially" complete skeleton of an adult female captive animal from an unknown locality, and the skull of a subadult male without a fully erupted dentition and a locality specified only as "Cameroon". Both specimens are housed in the Anthropological Institute and Museum at the University of Zurich.

According to Schwartz (1996), the new genus is distinguished by the following postcranial characters: Long tail, less hooked ulnar styloid process, humeral entoepicondylar foramen, short ilia, and non-bifid C2. Craniodentally, it is characterised by diminutive M3s and P3s, laterally compressed lower premolars, higher cheek teeth cusps, more buccally emplaced cristid obliquas on the lower molars, a lacrimal fossa internalised within the orbit, and a more hooked coronoid process and "goneal" region. The maxillary and mandibular dimensions of the first and second molars of the alleged

new genus are within the range of measurements of 33 potto *Perodicticus potto*.

Unfortunately, Schwartz does not sort his comparative sample of *P. potto* according to locality, so that it is uncertain whether it contains undiagnosed specimens of *Pseudopotto*. Moreover, he does not examine the holotype of *P. potto*, present statistics to test if the new genus differs from *P. potto* (which it so resembles), or quantify any of the supposedly diagnostic characters. His claims as to the diagnostic merits of his metric characters, therefore, cannot be tested. Considering that the holotype of *Pseudopotto* is a captive specimen, and that there is no information given as to how long this animal was in captivity, it is unlikely that many of Schwartz's metric traits will prove diagnostic. Captive animals usually show differences in muscular and ligament attachment areas (hooked coronoid and "goneal" region), and overall body size (Sarmiento, 1985). Moreover, differences in the diets of captives can affect cusp height and wear surfaces considerably. The cheek teeth chosen as diagnostic (i.e., P3, M3, lower premolars), are notoriously variable in size, not just in pottos (see Fig. 9 in Schwartz, 1996) but in all primates; occasionally, there are differences between the right and left side of the same individual. In this regard, the absence of the right half of the mandibular and maxillary dentition in the holotype further adds uncertainty to Schwartz's metric characters.

I examined 11 specimens of *P. potto* from localities well outside of Cameroon. All of Schwartz's (1996) diagnostic non-metric characters for *Pseudopotto* are

Table 1. The frequency of occurrence in *Perodicticus potto* of the diagnostic non-metric traits of *Pseudopotto martini* (Schwartz, 1996). The mean and range of variation in the number of caudal vertebrae of *P. potto* are also provided (Schultz, 1961).

	Frequency (%)		Sample size
1) Entoepicondylar foramen	4.5	(41)	11
2) Non-bifid C2	3	(27)	11
3) Internalised lacrimal fossa	3	(27)	11
Caudal vertebrae ^a	\bar{x} = 11.3	range 5-17	n = 31

^a Structures present unilaterally are tabulated as 0.5. The 11 specimens of *P. potto* are from the mammalogy collection at the American Museum of Natural History.

^b Since the type specimen for *P. martini* was a captive animal and was missing at least one caudal vertebra, it is unlikely that Schultz, who worked extensively with the Zurich collection, would have included it among his sample of 31 *P. potto*. Three additional *P. potto* examined by the present author also yielded a mean of 11 caudal vertebrae (range = 8-15).

prevalent in *P. potto* (Table 1). Although Schwartz does not provide measurements of tail length, the relationship between tail length and the number of caudal (tail) vertebrae allows some degree of comparison and fails to show differences between *P. potto* and *Pseudopotto*. As counted from Schwartz's Figure 3, *Pseudopotto* has at least 11 caudal vertebrae; one or more elements may be missing. This value is close to the mean seen in *P. potto* (Table 1).

Schwartz (1996) does not present convincing data that merit the erection of a new genus or even a new species. All of the data that could be tested indicate that *Pseudopotto* does not differ in any significant manner from *P. potto*. Whether or not these, or other specimens presently recognised as *P. potto*, prove to be a new taxa (Groves, 1974), must await detailed studies which map out taxa distribution, find areas of sympatry, and quantify the significant morphology and its associated adaptive differences.

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THE PROBLEM OF SUB-SPECIES: FURTHER COMMENT

I have read the paper proposing revision of the subspecies of the leopard *Panthera pardus* (Miththapala *et al.* 1996). Dr O'Brien and his group are high professionals and this article presents a lot of material. Personally, I do not like that the authors use genetic distances in this particular case. For me, these characteristics are rather fuzzy, I prefer to work with

molecular markers, *e.g.* with differences in the nucleotide sequences. I would say that the authors should continue their research and their next step should be sequencing of a mitochondrial gene (or genes) or a so-called D-loop (or control) region. The choice of a particular gene or the D-loop region depends on the goal of the research. But as a first step in answering the question about the number of subspecies in leopards the author's data are OK.

In principle, O'Brien's molecular approach to the problem is the same as mine. I do not believe that there are 27 leopard subspecies. To take into consideration morphology only, as in the letter of P. Leyhausen (1997); how many subspecies does one need to describe, for instance, within the domestic dog or cat? This situation I know well from the example of sturgeons. During the 19th century, many researchers described scores of species and subspecies within European and American sturgeons until they understood that there is a great morphological variation within a species in such characters as the shape of rostrum or colour of different body parts. Our genetic and molecular data showed that the number of sturgeon species is rather restricted. We also found a cryptic species, which some ichthyologists have described as a subspecies, but we showed that the genetic and molecular uniqueness of this form is much greater than that of a subspecies. Incidentally, cryptic species are found now in many animal groups, for instance whales, when molecular methods are applied. It means that there is also an opposite problem: the existence of sibling species which cannot be discriminated on the basis of morphology. I am convinced that the number of subspecies and species should be based only on the basic genetic and molecular information. Of course, there will be discussions on the interpretation of this information among specialists, but this is understandable; we are present at the beginning of the emerging science of molecular phylogeny. Currently, there is only a trend towards a consensus among molecular geneticists on how to apply the genetic and molecular data to the traditional taxons, such as species or subspecies. But the genetic and molecular data have already become a basis of another emerging science, conservation biology.

It is not easy for a layman to make a judgement in the debate between molecular scientists and traditional taxonomists. But, for example, the colour of a tail or a pattern of stripes on the tail of cats are genetic characters, which are inherited within a species and can be extremely polymorphic. I am convinced that for modern taxonomy, systematics and conservation we need to use more fundamental genetic characters.

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[Source: *Cat News* 27: Autumn 1977]

HOW TO DEFINE A SUBSPECIES?

Anonymous (1996) raises the question whether the recent findings of O'Brien and co-workers would justify (or force) us to reduce the number of leopard subspecies from 27 to 8. To this, or rather the validity of the evidence, Alan Shoemaker objects. Shoemaker argues that (1) the museum material available has not been given proper attention; (2) the animals sampled by the O'Brien group were mostly captive-born, more often than not closely related and in some cases of doubtful ancestry; and (3) several of the subspecies to be lumped into one are easily distinguishable to the expert.

After measuring and photographing skulls and furs of all felids, including leopards, in 22 major museums all over the world, and having seen innumerable leopards in zoos—many of them wild caught at registered localities—and quite a number also in the field in East and West Africa, India, Nepal and Sri Lanka, I cannot but sympathise with Shoemaker's view, although some of his sweeping statements may be arguable, e.g., "Zaire leopards are consistently small..."; in fact, the largest leopard skull in the collection of the Natural History Museum in London is labelled "Upper Uelle, NE Congo-No.16.6.29.5, basicranial length 231 mm". And all the museum specimens I have seen are not sufficient to decide whether some of the subspecies described are valid or not. There simply are not enough specimens of each of the subspecies described.

There are mainly two reasons why I cannot reservedly accept conclusions based on the O'Brien evidence: (1) they completely neglect the problem of polymorphism; and (2) they assume that the evidence works in both directions.

1. Polymorphism is a widespread phenomenon in the

living world. There is no reason why there should be no biochemical and molecular polymorphisms within a natural population. I do not know of a single pertinent investigation. To neglect the possibility that some or even considerable polymorphism could exist within a population diminishes the weight of the differences between samples, the various inadequacies of which Shoemaker justly points out.

2. Granted that differences found between samples are significant, I quite agree that they can serve to validate subspecies (or species). However, if this method of approach yields no significant difference, it does not follow that no such difference exists. It only follows that the method fails to reveal one.

Any investigator can look at an infinitesimal fraction only of an animal's total molecular, biochemical and genetic make-up. Who says that the significant (or what a given taxonomist believes to be significant) differences between any two organisms under investigation must express themselves in just that fraction? Who says that the significant difference between subspecies A and B must show in the same quarter as that between B and C or that between C and A? In other words: the relatedness of A, B and C cannot be quantified exactly because, more often than not, it is qualitatively different. Any attempt by any one method or technique to monopolise taxonomy or formalise it too strictly must end in failure. As long as I can see at a glance whether what I am looking at is a specimen of *Panthera pardus saxicolor* or *P.p. tulliana*, I shall consider them as different subspecies, mDNA or not.

After all, the three criteria O'Brien and Mayr have named for defining a subspecies leave a wide margin and are not unequivocal. How would one establish, for instance, "...a unique natural history relative to other subdivisions (i.e. in this case: to each other, ref.) of the species." For *Prionailurus bengalensis horsfieldi* and *P.b. trevelyani* respectively? All these recently developed molecular techniques are certainly extremely useful tools. But the living organism is the result of innumerable interacting factors which in order to produce a functional whole, must combine and compromise. Therefore, no single one can claim to represent that whole exclusively or adequately. Systematists will always have to try and balance the evidence of morphology, embryology, physiology (biochemistry, genetics and molecular build-up included) and palaeontology, because that balance constitutes the essence of the living organism and its evolutionary history.

For that reason, whether we like it or not, taxonomy and systematics will always contain some elements of uncertainty and subjective judgement. I did not always

think so. Each time a new approach to the problem was opened up I hoped it might provide the final, irrefutable, absolute solution: electrophoresis, cytogenetics, gene charts, and mDNA and mRNA analysis. Now, at the end of my life, I am trying to reassemble cat systematics on the basis of skulls I have measured and photographed in the world museums. When I started to collect the data I still honestly believed it should be possible to solve conclusively all the riddles of interspecies relationships—alas, no longer! When all animal life is extinct and the relics safely preserved in glass cases, some late colleague will at last be able to write the definitive systematic. There will be no living organism to prove him wrong—then.

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(source: *Cat News* 26: spring 1997)

BABOON NOMENCLATURE

On *Primate-Talk*, someone recently posted: "A colleague of mine is looking for the current correct way to designate baboons (*Papio cynocephalus* and *Papio anubis*) in the scientific literature. Years ago, information was given that the correct designation was *Papio cynocephalus*, of *cynocephalus* and *anubis* sub-types' (depending on how they looked), because the *cynocephalus* and *anubis* subspecies interbreed. Some scientific journal reviewers, however, have questioned this phrasing. Does someone know what the correct names for the different species of baboons are these days, and whether possible interbreeding needs to be considered or mentioned?"

This apparently simple query opens many worm-cans, not least the definition of "species". The short answer is that there is no "right" answer, but there are at least three current usages:

- A usage that is gaining ground (e.g., at the Southwest Foundation for Biomedical Research, the world's largest scientific baboonery) is to call all living baboons (excluding geladas and mandrills, of course) subspecies of one species (Williams-Blangero *et al.*, 1990; Jolly, 1993). This follows the Biological Species concept of Mayr (1982),

which accords greatest weight to interpopulational gene-flow in the wild. This would make "olives" and "yellows" *Papio hamadryas anubis* and *Papio hamadryas cynocephalus*, respectively.

- The old (but still respectable) usage that recognises five full species: *P. hamadryas*, *P. papio*, *P. cynocephalus*, *P. anubis*, and *P. ursinus* (vernacular names: hamadryas, Guinea, yellow, olive, and chacma baboons, respectively; Hill, 1970). This also accords (more or less) with the currently fashionable "phylogenetic species concept", which emphasises whether you can consistently tell members of the populations apart, not whether they interbreed. The trouble is that there are at least two others that you can easily and consistently tell apart from these five, but no one recently has raised them to full species status.
- The usage beloved of socio-ecologists (e.g., Smuts *et al.*, 1986), which divides *Papio* into two species: *P. hamadryas* (for the hamadryas baboon) and *P. cynocephalus* for the rest (which are often called subspecies). The two species are sometimes vernacularised as "desert baboons" and "savanna baboons", respectively. According to this, yellows are *P. cynocephalus cynocephalus*, olives are *P. c. anubis*. This system is widely used, but is my least favourite, because: (a) it doesn't fit any accepted definition of "species" very well; (b) *P. cynocephalus* as thus defined is almost certainly paraphyletic (i.e., hamadryas are probably related to olives more closely than olives are to chacmas, for example); (c) many "savanna" baboons don't live in "savannas".

"*Papio cynocephalus*, of *cynocephalus* and *anubis* subtypes" sounds scientific, perhaps, but it's not "Scientific Nomenclature" in any neo-Linnaean sense. It would be better simply to say: "yellow and olive baboons, *Papio hamadryas* (s.l.)", or if you prefer, "yellow and olive baboons, *Papio cynocephalus* (s.l.)". Adding "s.l." just shows that you are using these terms in their broad, inclusive sense. Alternatively, you could say "yellow baboons (*Papio cynocephalus*) and olive baboons (*P. anubis*). Guinea, hamadryas and chacma baboons can be named in analogous ways.

All this is irritating, I am sure, to biomedical researchers because the choice between these usages depends entirely upon the definition of "a species", which tends not to be a major concern on their part! It is important, however, to indicate what "kind" of baboon is used in an experiment, and for this the vernacular terms are the least ambiguous. It is also a good idea to indicate the geographical origin of the stock from which the animals came, if it is known. Finally, hybrid ancestry is always a possibility for animals bred in captivity, and even for some wild-caught individuals.

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**CURRENT PROBLEMS WITH PAPIO
TAXONOMIES**

Species with a wide latitudinal and geographic
distribution, occupying a variety of habitats and
comprised of a number of distinct populations, often
present taxonomic problems. Since the more remotely
related populations on either end of a distribution may
comply with the "sympatric test" (naturally occurring
populations with overlapping ranges that do not
interbreed; Mayr, 1982; Patterson, 1985) used to
demonstrate species differences, but are genetically
linked through intermediary populations, it is often
up to the taxonomist to decide where to make the cut-
off defining a species. This injects subjectivity to the
most objective of all taxonomic categories.

Comprised of at least seven distinct populations
(based on external characters such as arched tail vs.
broken tail, tail length, adult and newborn pelage
colour and texture, callosity colour, presence of mane,
cape, or hair fringes, and body size; Jolly, 1993;
Kingdon, 1997), and distributed throughout tropical
Africa and into the temperate regions of Southern
Africa, baboons are no exception. A taxonomy of

baboons (*i.e.*, members of the genus *Papio* excluding
mandrills, drills and geladas), therefore, must out of
necessity be partially subjective. Adoption of one or
another of the three currently recognised species
concepts, that is "biological species concept" (BSC;
Mayr, 1982) "species recognition concept" (SRC;
Patterson, 1985), or "phylogenetic species concept"
(PSC; Cracraft 1987), and differences in the evidence
used to indicate species differences (*i.e.*, ecological,
genetic, morphological or behavioural) may further
add subjectivity to a taxonomy (Jolly, 1993; Sarmiento
et al., 1995).

Taxonomic subjectivity, however, is not the main
source of ambiguity leading to the current confusion
in baboon taxonomy (Altmann & Altmann, 1970; Hill,
1970; Smuts, *et al.* 1986, Jolly, 1993). This ambiguity
stems largely from the untested assumptions made by
each of the currently recognised taxonomies. Testing
these assumptions is critical to arrive at which of the
current usages, if any, is the most appropriate.

- A) The single species taxonomy, in which each of
the distinct populations of baboons (Fig. 1) is
considered a subspecies of *Papio hamadryas* (Jolly,
1993), assumes cross-breeding at each of the zones
where the ranges of the different baboon
populations come into contact. Only two of as
many as 12 of these contact zones (*i.e.*,
hamadryas-anubis zone, anubis-yellow zone) have
been studied (Fig. 1). Gene-flow was found to
occur within both of these contact zones (Kingdon,
1971; Samuels & Altmann, 1986; Phillips-Conroy
et al., 1991). What little is known of the contact
zone between kinda and grey-footed baboons,
suggests that there is no gene-flow between these
two populations (Ansell, 1978; pers. observ.). All
of the other contact zones are poorly known. There
is a conspicuous absence of museum specimens
from Shaba Province (Democratic Republic of
Congo) (Schouteden, 1944), northern
Mozambique, western Zambia, and Angola in
areas where many of the distinctive baboon
populations (*i.e.*, kinda-anubis, yellow-anubis?,
grey-footed-yellow, grey-footed-kinda, kinda-
chacma?) either meet or have overlapping ranges.
- B) A taxonomy which recognises all the distinct
populations of baboons as different species of the
genus *Papio* is at odds with the BSC, which usually
considers allopatric populations with some gene-
flow across contact zones as subspecies of a single
species (Mayr, 1982). This taxonomy is also at
odds with the SRC, which considers interbreeding
animals with a common specific mate recognition
system as members of the same species (Patterson,
1985). Although the PSC (Cracraft, 1987) may
support designating each of the distinct populations
of baboons as different species, the currently used

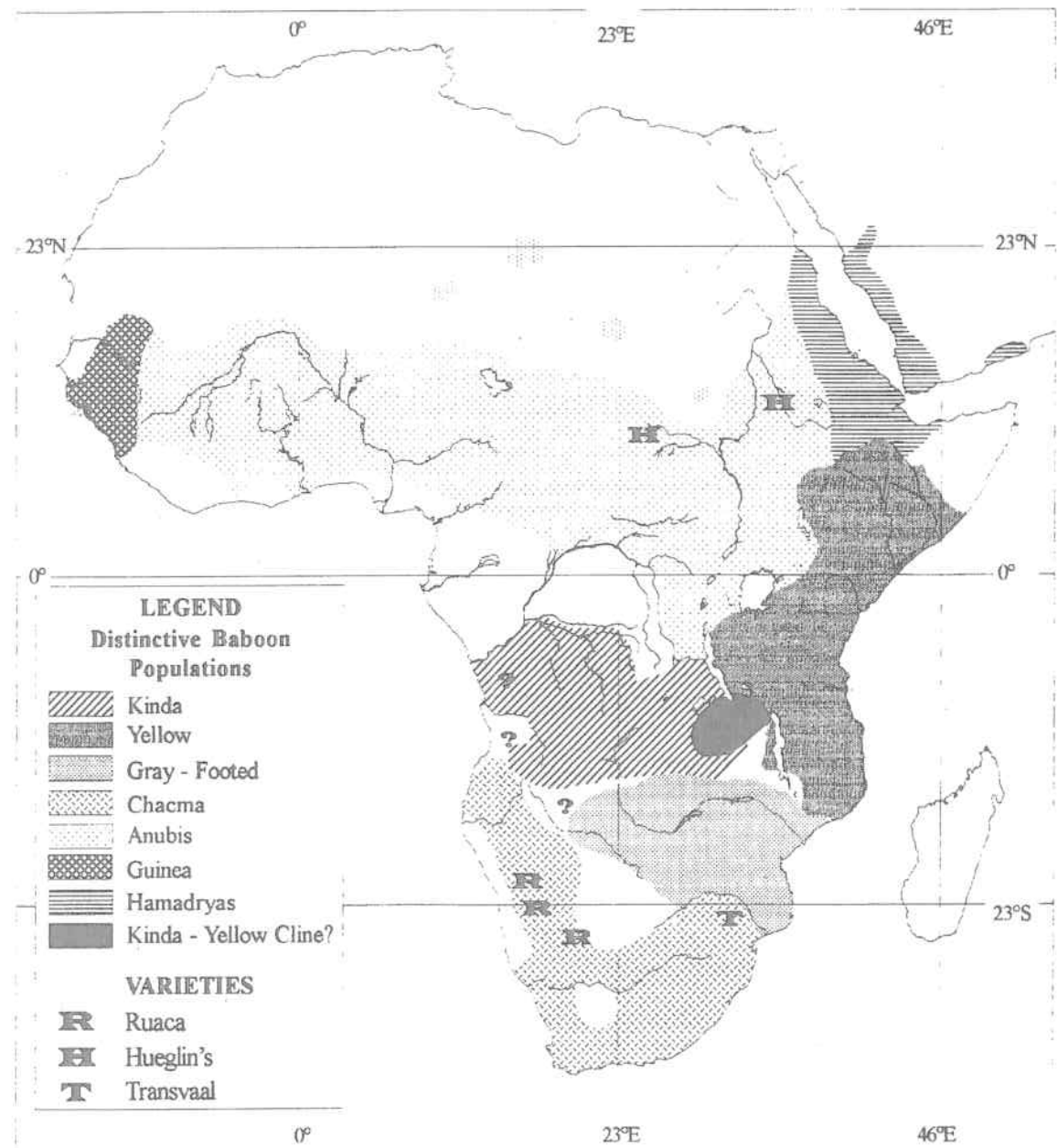


Figure 1. Distribution of the various distinctive baboon populations in Africa. Note the following: (1) gray-footed grades more or less imperceptibly into chacma; (2) Transvaal and ruaca are varieties of chacma; (3) Hueglin's is a variety of anubis; (4) hamadryas and anubis, and anubis and yellow have contact zones where interbreeding is known to occur; (5) no interbreeding has been documented between yellow and hamadryas, in any of their contact zones, most of which are poorly known; (6) the kinda-yellow contact zone (eastern Zambia) may form a cline; and (7) with exception of the Congo river, most rivers act more as filters than as biogeographic boundaries.

The possible contact zones are as follows: (1) kinda-grey-footed; (2) kinda-yellow; (3) kinda-anubis(?); (4) grey-footed-chacma; (5) grey-footed-yellow; (6) yellow-anubis; (7) yellow-hamadryas; (8) anubis-guinea; (9) anubis-hamadryas; (10) kinda-chacma. The Kalahari separates the grey-footed-chacma boundary into two contact zones. The yellow-anubis boundary has two separate contact zones created by Lake Victoria. In this regard, as many as 12 or 13 geographically separate contact zones are known to occur. Possible contact zones without known location are followed by a question mark in parentheses.

five species taxonomy (Hill, 1970) fails to recognise at least two of the distinct populations (*i.e.*, kinda and grey-footed; Jolly this issue, pp. 47-48). Even if this taxonomy was amended to encompass these two populations, it may still not

be in sync with the PSC. To do so, it would be necessary to know if any of these populations imperceptibly grade into each other. That is, whether they exhibit a cline, or if they remain consistently identifiable at their respective contact

Table I. Summary of external phenotypic characteristics exhibited by each of the distinctive populations of baboons. The available binomial or trinomial nomen appears in parentheses after common name:

Species	pelage	size	mane	face	tail	perineum
Guinea (<i>papio</i>)	reddish-brown	small to medium *	short to medium	purple-black	arched	pink
Hamadryas (<i>hamadryas</i>)	grey-brown to light grey in harem males	small to medium*	long	Reddish/flesh coloured	arched	pink
Anubis (<i>anubis</i>)	olive-brown including under-sides and feet		short to medium	purple-black	broken	black
Hueglin's (<i>hueglini</i> , variety of anubis)	lighter than anubis with lighter undersides		short to medium	purple-black	broken	black
Chacma (<i>ursinus</i>)	dark brown, feet black		none, nape and neck black-fringed	purple-black	short and broken	black
Ruaca (<i>ruacana</i> , variety of chacma)	lighter than chacma	smaller than chacma	none, nape and neck black-fringed	purple-black	short and broken	black
Transvaal (<i>orientalis</i> , variety of chacma) ***	lighter than chacma		none, nape and neck black-fringed	purple-black	short and broken	black
Gray-footed (<i>griseipes</i>)	grey-brown including feet		none, nape and neck black-fringed	purple-black	broken	black
Yellow (<i>cynocephalus</i>)	brownish-yellow		none, nape and neck yellow - fringed	purple-black	variably arched	black
Kinda (<i>kindae</i>)	Brownish-yellow, infants reddish**	small, including teeth and skull*	none	purple-black	arched	black

Notes made of body size only if relatively small

**Neither of the two skins seen of the Kinda infants from Angola and Katanga, Zaire, were reddish as claimed by Ansell (1960).

***represents a cline from gray-footed to chacma

zones and can thus be considered true species (in the PSC sense; Cracraft, pers. comm.).

- C) Dividing *Papio* into two species (*P. hamadryas* for hamadryas baboons and *P. cynocephalus* for the remaining populations) also assumes cross-breeding at each of the zones where the ranges of the non-hamadryas baboon populations meet or overlap. Because hybridisation at the hamadryas-

anubis contact zone has been well documented, this taxonomy also assumes that gene flow between these two populations is (presently and/or historically) less than occurs between the other non-hamadryas baboon populations. What little is known of the contact zone between grey-footed and kinda baboons suggests this assumption is incorrect. The fact that gene-flow occurs between

anubis and hamadryas baboons, however, cannot in itself be used to support a taxonomy placing the two baboons in the same species. Among papionins, gene-flow naturally occurs even between what are recognised as different genera (*i.e.*, *Theropithecus* and *Papio*) (Dunbar & Dunbar, 1974; Jolly *et al.*, 1997). Behavioural, morphological and ecological differences, and the presence of an isolating mechanism limiting gene flow between male anubis and female hamadryas baboons (Kummer, *et al.* 1970; Yalden, *et al.* 1977; Kummer, 1995), are all consistent with different species designations in other cercopithecines (*i.e.*, *Cercopithecus ascanius* and *Cercopithecus mitis*; Struhsaker *et al.* 1988).

Whether or not the degree of differentiation shown by anubis and hamadryas is diagnostic of species differences is in part a subjective decision and depends on where the taxonomist chooses to make the species cut-off. Since the rate of gene-flow between distinct populations is expected to differ (historically and presently) at each of the contact zones, the taxonomy must be consistent in the magnitude of behavioural, morphological, ecological and/or genetic differences chosen to designate taxonomic levels (*i.e.*, either subspecies or species) for all the baboon populations. Regardless of its subjectivity, any practical resolution of the hamadryas/anubis taxonomy depends on knowing the relative differences among the distinctive baboon populations and what happens at their respective contact zones. All of the currently recognised species definitions, as set out either in the BSC (Mayr, 1982), the SRC (Patterson, 1985) or the PSC (Cracraft, 1987), rely on having data from contact zones (when these exist) to arrive at species designations. Regardless of the definition used, resolving the ambiguity in baboon taxonomy depends on knowing, at the very least, the phenotypes and sexual interactions of those animals at the contact zones of the distinctive baboon populations. Without the data necessary to test for species differences, the best alternative to ambiguous taxonomies is to provide data on geographic origin, and a photograph and/or summary description placing the animal in question in one of the distinct populations. In the case of laboratory animals, the likelihood of a hybrid ancestry should also be noted (see Jolly this issue, pp. 47-48).

Instead of further propagating a 40 year old discussion on baboon nomenclature, this note will hopefully provide an impetus to gather the data necessary to arrive at a practical (albeit subjective) solution to this problem.

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FOREIGN AID AND CONSERVATION OF TROPICAL FORESTS: AN ACTION PLAN FOR CHANGE

There is currently a widespread and enormous expenditure of foreign aid for development and conservation in the tropics. In addition to the World Bank and the European community, aid is particularly prominent from Japan, United States of America, United Kingdom, France, Germany, Finland, Sweden, Norway and the Netherlands.

Although more time, effort and money are being expended for conservation in the tropics than ever before, the loss of natural resources and areas of conservation value is occurring at an unprecedented rate. Numerous proximate variables contribute to this increasing loss, but ultimately the problem revolves around the issue of ever increasing rates of consumption due to a combination of expanding human populations in most tropical countries, and to excessive consumption tied to policies encouraging economic growth in the so-called developed nations.

In the short and intermediate term, however, much of the loss in the conservation race can be attributed to inappropriate foreign aid development programs and projects. These foreign aid efforts either threaten conservation areas directly, or are ineffective in their attempts at conservation. This ineffectiveness is often due to excessive administrative costs, poor planning, contracting inappropriate advisors, and lack of accountability in terms of performance. Underlying these flaws is the practice by government aid agencies of subcontracting the administration and implementation of their bilateral aid grants to commercial companies and NGOs who, all too often, have little or no experience in, or deep-seated concern for, the countries and problems they are dealing with. In essence, these are some of the problems resulting from collaboration between government bureaucracies, commercial enterprises, and consulting firms.

Many of us who have participated in conservation in the tropics over the past 37 years feel that it is time

for a change. Specifically, we feel that government aid agencies have an obligation to both the donor constituency (the tax payers) and the recipient nations to use foreign aid grants in the most effective manner possible.

Biologists working in the tropics are often in a unique position to observe and collect information on foreign aid programs and projects that influence natural resources and conservation areas. How can this information be used effectively to bring about positive change? There is no simple formula that will apply to all cases. However, once the facts are assembled and alternative plans for more effective conservation projects are developed, a lobbying campaign can be implemented. This depends on effective teamwork between field workers and conservation lobbyists who have access to the decision makers and media.

We are in the early stages of developing a coalition between field biologists working in the tropics and Friends of the Earth (USA), an NGO based in Washington, D.C., that specialises in lobbying for conservation, and has had long experience in influencing government expenditures, both domestic and foreign. One of our first objectives is to develop a network of individuals who are prepared to participate in the resolution of problems involving foreign aid and conservation. We are seeking the collaboration of individuals who are in a position to collect information on specific cases of conservation and foreign aid. Initially we will focus our attention on problems of tropical forest conservation. The immediate goal is to identify and collect information on projects that influence the conservation status of specific forests.

Although most of our efforts will concentrate on projects that either threaten these forests or represent an inappropriate or ineffective approach to conservation, we will also highlight projects that are implementing conservation in an effective and appropriate manner. Understanding the basis of successful conservation projects is as important as identifying and describing the threats and failures.

The kinds of projects we will focus on include a wide range of activities, such as so-called development projects that will destroy tropical forests outright, as well as conservation projects that are inappropriate or ineffective. The specific cases selected for action will depend on the type and amount of information collected by ourselves and our colleagues while in the field. Once sufficient information is collected on a specific project, it will be presented as a case study to Friends of the Earth. Friends of the Earth is committed to examining these reports to determine what the potential and capacity for action are. Actions might include lobbying and publicity efforts that aim to improve the conservation status of the particular area in question, obtaining congressional oversight hearings, etc.

The following is a checklist of the types of

information needed for each case study:

1. Present status of area.
 - physical description: size, altitude, terrain, *etc.*
 - biological attributes
 - legal status and future plans; administrative agency
 - current conservation activities
 - regional setting, *i.e.*, general status of surrounding area
2. Details of project being evaluated.
 - objectives and activities of project
 - project administrators and managers
 - monitoring plans and current status
3. Financial details of project.
 - total budget and itemised allocations
 - donors (sources of funding)
 - financial administrators
 - overhead costs and an evaluation of effectiveness
4. Details of the problems.
 - direct conflict of interest
 - inappropriate or ineffective use of funds
 - sources of a problem: the perpetrators and beneficiaries
5. Sources of information, except where confidentiality is imperative. Includes documents (written contracts, proposals, reports, letters, newspaper articles, *etc.*), observations, interviews, photographs, *etc.*
6. Names and addresses of potential allies with similar concerns.
7. Recommendations for resolution of problems.
 - detailed suggestions for project improvement
 - details of agencies or other contracts that might be able to influence the project

Throughout the study of forest conservation problems, the observer must continually think in terms of what information is needed to make a compelling case for action to remedy the problem. The more corroborative information, the better. Detailed notes on all information and sources, as well as copies of relevant documents, will help to build a convincing case

If you are able to prepare a case study, can contribute to the development of such a study, or are simply interested in the problem, please contact Carrie Oren. Please include your E-mail address and areas of interest (professional, geographic, specific projects).

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CONVENTION AFRICAINE POUR LA CONSERVATION DE LA NATURE ET DES RESSOURCES NATURELLES

Le continent africain s'est engagé à mettre ses ressources naturelles et humaines au service du progrès général des peuples dans tous les domaines de l'activité humaine, puisqu'il y a prise de conscience de l'importance toujours grandissante des ressources naturelles au point de vue économique, nutritif, scientifique, éducatif, culturel et esthétique. Aussi, grande est la prise de conscience des dangers qui menacent ce capital irremplaçable. Une action collective entreprise en vue de la conservation, de l'utilisation et du développement de ce capital par l'établissement et le maintien de son utilisation rationnelle pour le bien-être présent et futur des générations a été décidée par l'établissement de la convention africaine pour la conservation de la nature et des ressources naturelles.

Le principe fondamental de cette convention vise à prendre les mesures nécessaires pour assurer la conservation, l'utilisation et le développement des sols, des eaux, de la flore et des ressources en faune, en se fondant sur des principes scientifiques et en prenant en considération les intérêts majeurs de la population.

Les expressions suivantes qui ont respectivement la signification ci-après, méritent d'être citées:

1. Ressources naturelles: signifie ressources naturelles renouvelables, c'est à dire les sols, les eaux, la flore et la faune;
2. Spécimen: désigne tout représentant d'un espèce animale ou végétale sauvage ou une partie d'une telle plante (ou animale);
3. Trophée: désigne tout spécimen d'animal mort ou une partie d'un tel spécimen, qu'elle ait été incluse ou non dans un objet travaillé ou transformé ou traité de toute autre façon, à moins qu'elle n'ait perdu son identité d'origine, ainsi que les nids, oeufs, coquilles d'oeufs.
4. Réserve naturelle: désigne toute aire protégée en vue de ses ressources naturelles soit comme réserve naturelle intégrale, parc national ou réserve spéciale.
 - 4.1 Réserve naturelle intégrale: désigne une aire:
 - a. placée sous le contrôle de l'Etat et dont les limites ne peuvent être changées, ni aucune partie aliénée, sauf par l'autorité législative compétente.

- b. est sur l'étendue de laquelle toute espèce de chasse ou de pêche, tout pâturage, toute fouille ou prospection, sondage, terrassement ou construction, tous travaux tendant à apporter des perturbations à la faune ou à la flore, toute introduction d'espèces zoologiques ou botaniques, soit indigènes, soit importées, sauvages ou domestiques, sont strictement interdits.
 - c. où il est défendu de résider, de pénétrer, de circuler ou de camper et qu'il est interdit de survoler à basse altitude sans autorisation spéciale écrite de l'autorité compétente et dans laquelle les recherches scientifiques y compris les éliminations d'animaux et de végétaux en vue de maintenir un écosystème ne peuvent être effectuées qu'avec la permission de l'autorité compétente.
- 4.2 Parc national: désigne une aire:
- a. placée sous le contrôle de l'État et dont les limites ne peuvent être changées, ni aucune partie aliénée, sauf par l'autorité législative compétente.
 - b. exclusivement destinée à la propagation, la protection, la conservation et l'aménagement de la végétation et des populations d'animaux sauvages, ainsi qu'à la protection des sites, des paysages ou des formations géologiques d'une valeur scientifique ou esthétique particulière, dans l'intérêt et pour la récréation du public.
 - c. dans laquelle l'abattage, la chasse, la capture d'animaux et la destruction ou la collecte de plantes sont interdits, sauf pour des raisons scientifiques ou pour les besoins de l'aménagement et à condition que de telles opérations aient bien lieu sous la direction et le contrôle de l'autorité compétente.
 - d. comportant tout milieu aquatique auquel s'appliquent toutes ou l'une des dispositions du point (4.2). Les activités interdites dans les réserves naturelles intégrales en vertu des dispositions des points (4.1)b sont également interdites dans les parcs nationaux sauf dans la mesure où elles sont indispensables pour permettre aux autorités du parc, notamment par des mesures d'aménagement, de mettre en oeuvre les dispositions du point (4.2)b pour permettre au public de visiter ces parcs, néanmoins, la pêche sportive peut être pratiquée avec l'autorisation et sous le contrôle de l'autorité compétente.
- 4.3 Réserve spéciale: désigne d'autres aires protégées telles que:
- a. Réserve de faune: qui désigne une aire:
 - mis à part pour la conservation, l'aménagement et la propagation de la vie animale sauvage, ainsi que pour la protection et l'aménagement de son habitat;
 - dans laquelle la chasse, l'abattage ou la capture de la faune sont interdits, sauf par les autorités de la réserve ou sous leur direction ou leur contrôle;
 - où l'habitation et les autres activités humaines sont réglementées ou interdites.
 - b. réserve partielle: ou sanctuaire, désigne une aire mis à part la protection de communautés caractéristiques d'animaux et plus généralement d'oiseaux sauvages ou la protection d'espèces animales ou végétales particulièrement menacées ainsi que les habitats indispensables à leur survie.
 - c. réserves des sols, des eaux et des forêts: désignent les aires mis à part pour la protection de ces ressources particulières.
- Sols**
- Les mesures efficaces de conservation et d'amélioration des sols doivent être prises dans la lutte contre l'érosion et la mauvaise utilisation des terres à travers les points suivants:
1. Adoption des plans d'utilisation des terres fondées sur des études scientifiques (écologiques, pédagogiques, économiques et sociologiques) et en particulier sur des classifications relatives à la capacité d'utilisation des terres.
 2. Amélioration de la conservation du sol et l'introduction de méthodes culturelles meilleures qui garantissent une productivité des terres à long terme.
 3. Le contrôle de l'évasion causée par diverses formes d'utilisation des terres et qui pourrait aboutir à une perte des couverts végétaux.
- Eaux**
- Les politiques de conservation, d'utilisation et de développement des eaux souterraines et superficielles doivent être instituées pour garantir aux populations un approvisionnement suffisant et continu en eaux potables en prenant les mesures appropriées, eu égard:
1. à l'étude des cycles de l'eau et aux inventaires par bassin de drainage;

2. à la coordination et la planification des projets de développement des ressources en eau;
3. à la prévention et au contrôle de leur pollution.

Flore

Des mesures nécessaires doivent être prises pour protéger la flore et assurer la meilleure utilisation et son meilleur développement à travers les actions suivantes:

1. Adoption des plans scientifiquement établis pour la conservation, l'utilisation et l'aménagement des forêts et de parcs en tenant compte des besoins sociaux et économiques des populations, de l'importance du couvert végétal pour le maintien de l'équilibre hydrologique d'une région, pour la productivité des sols et pour conserver les habitats de la faune.
2. Contrôle des feux de brousse, de l'exploitation des forêts, du défrichement et du surpâturage pour les animaux domestiques et sauvages.
3. Mise à part des surfaces constituées en réserves forestières, l'application des programmes d'afforestation là où c'est nécessaire.
4. Création de jardins botaniques en vue de perpétuer les espèces végétales qui présentent un intérêt particulier.

Ressources en faune

Dans le cadre d'un plan d'utilisation des terres et du développement économique et social des populations, la conservation, l'utilisation rationnelle et le développement des ressources en faune et de leur environnement doivent être pris en compte. Ces ressources doivent être aménagées suivant les plans basés sur les principes scientifiques suivants:

1. L'aménagement de la faune à l'intérieur d'aires sélectionnées en suivant les buts assignés et l'aménagement de la faune exploitable en dehors de ces aires pour en obtenir un rendement maximal soutenu, compatible avec les autres utilisations des terres et complémentaires à celles-ci.
2. L'aménagement des milieux aquatiques, qu'ils soient d'eau douce d'eau saumâtre ou d'eaux côtières, en tendant à diminuer les effets nuisibles des pratiques d'utilisation des eaux et des terres qui pourraient avoir un effet néfaste sur les habitats aquatiques.

Espèces protégées

Il est important et urgent d'accorder une protection particulière aux espèces animales et végétales

menacées d'extinction ou qui seraient susceptibles de le devenir ainsi qu'à l'habitat nécessaire à leur survie. Dans le cas où l'une de ces espèces ne serait représentée que sur le territoire d'un seul État, ce dernier a une responsabilité toute particulière pour sa protection.

Trafic de spécimens et de trophées

L'importation et le transit des spécimens et trophées doivent être accompagnés d'autorisation requise sous peine de la confiscation des spécimens et trophées illégalement exportés et sans préjudice à d'autres sanctions éventuelles.

[source: *Vie & Nature*, No. 3]

NEWS

"STINK" OVER MONKEY MEAT

According to the 23 May 1996 issue of the British *Times* newspaper, some Spanish baggage handlers refused to handle luggage on flights from Malabo, Equatorial Guinea, to Madrid, Spain, after the discovery of rotting monkey meat in passengers' suitcases. There is one flight a week from Malabo, the capital of Equatorial Guinea, a former Spanish colony, to Barajas Airport, Madrid. The meat is destined for the kitchens of the immigrant Equatorial Guinean community living in Spain. Some of the meat is carried in diplomatic bags. Iberia Airlines responded to baggage handlers' complaints by issuing protective gloves and masks to baggage handlers but some still refused to touch luggage coming from Malabo. One handler said: "I am sure a few monkeys arrive every time a plane lands from Guinea. But we can't really check each and every suitcase on each and every flight."

All monkey species are listed on Appendix I or Appendix II of the Convention on International Trade in Endangered Species (CITES). This means that an export permit from the government of Equatorial Guinea, a CITES member since 1995, should accompany any shipment. Identifying whether the monkey meat came from an Appendix I or II species could be difficult, and it is possible that chimpanzee meat could be included in shipments.

Monkey meat is also reported to be carried on flights from Zaire to Belgium and is offered for sale in restaurants in Brussels. In March 1996, 21 people died in an epidemic of Ebola virus in Mayibout, Gabon. This outbreak was caused by eating chimpanzee meat. The "Monkey Meat Connection" from Africa could

well carry the Ebola virus into the heart of Europe.

[source: *IPPL News*, Vol. 23, No. 2, 1996]

MONKEY MEAT IN TANZANIA

Monkeys in Tanzania's Southern Highlands face extinction because locals are eating them, the state news agency Shihata reported on 14 November 1997. Quoting Mbinga game officer Patrick Ndimbo, the agency said that almost 60% of the area's 200,000 residents had now resorted to eating monkey meat, and that the monkey population was dwindling very fast. Shihata said only a few monkeys could be spotted in Huli forest and along the banks of Lake Nyasa, which borders Tanzania and Malawi.

"It is now common in Mbinga District to have monkey meat on the menu of most restaurants," the agency quoted Ndimbo as saying. He said the meat is considered such a delicacy that a small monkey can be traded for a goat.

This was the first time Shihata reported that people in Tanzania were eating monkeys.

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[source: *Primate-Talk*, 15 November 1997]

BEATING THE BUSHMEAT BUSINESS: SWAPPING GUNS FOR SCHOOLS, SIGHTSEERS

It's no secret that unsustainable hunting and habitat destruction have had a formidable impact on the flora and fauna on the world. Consider what's happening to the earth's jungles: one acre of tropical rainforest is destroyed in the world every second. And in the case of nonhuman primates, wild populations are in danger in all of the 92 countries in which these animals occur, according to Conservation International.

Thanks to aircraft surveys and satellite images, the effects of habitat destruction can be more easily measured and seen. But on a more fundamental level, how does one assess the number of animals killed by hunters and poachers every day? In West Africa, actual numbers are almost impossible to come by, but what is obvious is that the bushmeat trade is big business.

Primate populations have suffered greatly due to habitat loss from logging, farming and the live-capture-for-export trade, but it is the bushmeat trade that is generally considered to be the number one killer of primates in West Africa.

Today hunting for bushmeat in most of West Africa is no longer for sustenance, but instead for commercial trade. Rural communities supply bushmeat to urban traders, with growing assistance from logging trucks that keep moving deeper and deeper into the forest. "This type of hunting is highly unsustainable and is having a devastating impact on primate populations across West Africa," says Zena Tooze, director of CERCOPAN, a rehabilitation and conservation centre for orphaned monkeys in southern Nigeria. The West African country of Cameroon, for example, can't seem to escape its headline marriage to the logging industry. In fact, some city folk in Cameroon now look forward to and expect fresh bushmeat for supper thanks to the logging industry's vehicles and new passageways into previously intact forests.

Origin of Orphans

Nearly all of CERCOPAN's 50-plus primates were orphaned by this ever-increasing bushmeat trade. And there is no way of knowing how many nursing infants whose mothers were shot for bushmeat died during the ordeal, or how many continue to hang on in horrible conditions in villages. "Probably thousands more than we can stand to hear about," says Tooze.

Because CERCOPAN does not buy or sell any animals—to discourage further hunting—its orphans arrive mainly as donations to the project, either from Nigerians or expatriate owners, and usually after lots of convincing. Some are confiscated by Cross River State National Park officials, while CERCOPAN staff and management occasionally seek out species in more critical danger, such as Sclater's monkeys *Cercopithecus sclateri*.

Ironically, there is a law protecting many of Nigeria's animals. Enacted in 1985, Decree II fully protects species such as the threatened red-capped mangabey *Cercocebus torquatus* and the endangered Sclater's and red-eared *Cercopithecus erythrotis* guenons under Schedule 1. This means these animals cannot be hunted, traded or kept as pets. Under Schedule 2, a special permit is required to hunt or trade more common species, such as mona monkeys *Cercopithecus mona*. However, this law is rarely enforced, and there is very little awareness of the law throughout Nigeria.

Experiencing firsthand the overwhelming task of rehabilitating orphan primates, CERCOPAN strongly supports and promotes *in situ* conservation, a policy that works to protect already existing wild animal

populations and natural habitats. Primates taken from their forest home usually die. There are a few who survive. But once these intelligent animals come into contact with humans, their learned and instinctual survival skills diminish significantly. CERCOPAN hopes to send a few of them back. "The process is costly, lengthy and rigorous, and their fate is highly uncertain," notes Tooze. Nonetheless, CERCOPAN is going to give its captive population a decent shot. Tooze is working to establish a protected area in a rainforest in Nigeria that will serve as a reintroduction site for the project's monkeys. It will also serve to protect the numerous other wild animals living there and their forest environment.

Roadblocks to Freedom

Obstacles abound, however, with one of the major ones being the everyday details of primate rescue projects. Rehabilitating and releasing orphaned primates means socialising traumatised animals, training a local staff, performing numerous medical tests on the animals, constructing enclosures, fund-raising extensively, and teaching conservation in a Third World environment, to name a few.

Another obstacle is intense population pressure. Nigeria has an overabundance of people—some 111 million—and 45% of its population is under 14 years of age. According to the United Nations Population Fund, the country will be home to nearly 129 million people by the year 2000. In southern Nigeria—which touts a variety of forest environments (such as coastal mangrove forests, tropical swamp forests and moist tropical rainforests) and several endangered species (such as Sclater's and red-eared monkeys)—human population densities reach up to 1,000 people/km². The subsequent wide-spread and extensive farming further contributes to the destruction of the country's remaining forest habitat. Less than 10% of Nigeria's original rainforest remains, and roughly 90% of what does remain, is located in Cross River State in southern Nigeria.

Cross River State is where CERCOPAN is headquartered and where the project will build its release site. The site will serve several purposes; to: (1) act as an education centre to teach Nigerians and other visitors about conservation; (2) give local communities an alternative to hunting and farming; (3) serve as a tourist attraction for visitors who want to see monkeys in the wild; (4) be a research centre where local and international students can conduct scientific research; and (5) give CERCOPAN's six primate species a chance to live again in their natural forest home.

The centre, which will run on solar power, will help local communities mainly by sponsoring

community development projects, such as building schools and protecting water supplies. Some community members will be employed as park rangers, animal keepers, tour guides, and facility employees, such as cooks and cleaning attendants. Once a relationship has been developed with the local communities, CERCOPAN will begin building the site and preparing to relocate the animals.

Back to the Bush

Tooze is taking a unique approach to the monkeys' reintroduction. Because CERCOPAN is home to six species of monkey, she will initially release the most common and resilient—the mona and putty-nosed *Cercopithecus nictitans* monkeys. If these animals do not fare well in their new forest home, releasing endangered species, such as the red-eared monkey, into the same area will be re-evaluated. This way, reintroduction success of the most endangered animals can be more closely controlled.

Release programs are not entirely new to Nigeria. Nearly 10 years ago, Drill Ranch, operated by Pandrillus, was founded in Calabar, Cross River State. Pandrillus has since established a drill *Mandrillus leucophaeus* release site in Boki, Cross River State. Nearly 40 drills were transferred by helicopter to their new forest home in November 1996. In their new spacious, natural, open-topped enclosure, these endangered animals are learning to survive on their own. Drill Ranch is home to the largest population of captive drills in the world, and with its incredible breeding success—more than 20 successful births since 1994—appears to be setting certain standards for primate rehabilitation.

The biggest obstacle Tooze now faces in getting CERCOPAN's release site up and running is money. She has narrowed down the list of potential locations; the architectural design of the buildings is complete; and most of CERCOPAN's monkeys are more than ready to move. But as with most non-profit projects, funding is the most difficult component to come by. Still, Tooze is confident: "I know there are many organisations out there that are interested in and willing to support primate reintroduction projects. It may take longer than I hoped, but we'll get there. We've got 60 monkeys counting on it."

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[source: *IPPL News* 25: April, 1998]

A VIABLE PROTECTED AREAS NETWORK

IUCN has set a target of establishing at least 10% of the world's surface in protected areas. WWF's Forests for Life campaign is working towards protection for at least 10% of the world's forests by the year 2000. IUCN's Commission on National Parks and Protected Areas has developed detailed categories and methodologies regarding definition and establishment of reserves. The IUCN definition of a protected area is:

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal and other effective means.

IUCN has refined this into six sub-categories, ranging from full protection with the exclusion of people, to "managed resources protected areas" in which up to a third of the land can be under active management. In practice, working definitions differ between countries and treaty agreements.

Identification of potential protected area systems

Protected areas should be chosen to give the greatest possible biodiversity protection in a given area. Reserves should be ecologically representative—*i.e.*, a regional reserve network should contain examples of all the habitats found there under natural conditions, represented on a large enough scale to ensure survival of species and ecological processes. Few habitats are truly primary in the sense of never having been interfered with by humans, and today natural or semi-natural habitats are those maintaining most of their original species and ecosystem functions.

Criteria other than biodiversity are also important in choosing sites, and include ecological, cultural and economic values. Fragile habitats will require more protection than relatively robust ecosystems. Consideration should not be given just to present day conditions, but also to possible future changes, such as climate change. Priority may sometimes be needed for ecosystems that provide services to other ecosystems, such as catchment forests, coastal ecosystems, mangroves, *etc.* Total protected area is sometimes less important than the quality of the area protected.

Protected areas ideally should be included in a larger network, which allows for a more dynamic management, including:

- corridors connecting protected areas, allowing species migration;
- protection of transit sites for migratory birds and insects;
- establishment of a network of old-growth forest in fire refugia in commercially managed forests, *etc.*

Responsibility for protected areas

Opportunities for state-sponsored protected areas are declining due to economic problems, a reduction in state spending, opposition from industry, and conflicts over land use. In the future, a broader approach will be needed, involving people at all levels of society, with active involvement from industry and non-governmental organisations. In addition to "official" reserves, a protected areas network might include:

- areas set aside on land owned and managed by commercial companies;
- a proportion of community-owned land and commons;
- land under control of local or regional government;
- land owned by religious groups, including sacred groves and forests;
- agreed areas within indigenous peoples' reserves;
- areas of land and coast controlled by the military;
- land owned by conservation NGOs and private trusts;
- land owned by individuals.

Many of these already exist, but are usually omitted from statistics. Their status varies and further work is needed to address legal and voluntary frameworks for such networks. The relationship between strict protected areas and managed resource areas has to be determined at a national level; the latter should not be used as an excuse to avoid establishing fully protected areas. Governments should also be involved in supporting, and where appropriate, regulating, non-governmental protected areas. Emphasis on unofficial reserve systems is probably most appropriate in those countries where protection of ecosystems on state land is already well advanced. It is particularly important in countries where no further expansion of traditional protected areas is possible without competing for land with human groups.

Management of protected areas

Protected areas management is currently in crisis. Many areas designated for protection in the 1980s are, despite decisions taken at government level, continuing to be exploited, degraded and destroyed.

Several reasons can be identified, including sometimes government complicity and corporate greed. One fundamental problem has been a general failure of governments, conservation authorities and NGOs to understand local peoples' role within conservation areas. Many reserves have been set up on peoples' traditional lands, or on areas that were used for hunting, fuelwood and forage collection, or for cultural purposes. Looking at the role of people in protected area management should be a key priority for the future.

A number of approaches can help relieve tensions between rural dwellers and protected areas:

- a greater emphasis on participatory and co-

management approaches;

- approaches that allow controlled use of resources and ensure that protection is not automatically equated by local people with loss of customary rights;
- strategies to involve local people in spin-off benefits of protected areas through income from tourism;
- flexibility in control of reserves, to include workers, local people and others in management decisions;
- further development of the concept of buffer zones around reserves, to take the pressure off protected areas.

New approaches towards protected area management should involve the principle of stewardship, and a partnership between local people and others in management. This does not mean a loss of the basic rights of people to manage their own land and may, indeed, increase people's rights to police the management of land under local protection.

Conclusions

A future global or regional strategy for expanding and improving a system of protected areas depends on three main factors:

- making sure that existing protected area networks are effective, through improved management and greater local participation;
- broadening the scope of protected areas to allow people at all levels of society to join in the protection of biodiversity;
- extending official protected area networks.

During 1996 and 1997, WWF International coordinated a research project on issues of protected areas, including particularly the relationship between protection and local people.

Gonzalo Oviedo & Nigel Dudley

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[source: *Arborvitae*, 3, 1996]

CONSERVATION ORGANIZATIONS, ZOOLOGICAL PARKS, ANIMAL WELFARE ADVOCATES, AND MEDICAL RESEARCHERS CALL FOR IMMEDIATE ACTION TO ADDRESS THE COMMERCIAL BUSHMEAT CRISIS IN TROPICAL AFRICAN COUNTRIES

On 19 February, 1999, 34 experts, representing 28 different organizations and agencies, assembled at the offices of the American Zoo and Aquarium Association (AZA) in Silver Spring, Maryland to discuss the

commercial bushmeat crisis in tropical African countries and its impact on threatened and endangered species, particularly great apes. Participants in this meeting and many others in a growing worldwide network of concerned conservationists, zoo biologists, animal welfare advocates, and medical researchers, have developed the following consensus statement:

While we have our differences in approach, there is strong consensus that the commercial bushmeat trade in tropical African countries is having dire consequences, not only for wildlife, but also for people in Africa and throughout the world. If current unsustainable rates of exploitation continue, the commercial bushmeat trade will decimate, if not eliminate, some endangered species, such as great apes, forest elephants, and other fauna upon which the health of forest ecosystems depend. Indeed, it may have already caused the extinction of Miss Waldron's red colobus monkey, which formerly existed in the forested zones of Ivory Coast and Ghana.

The African great apes—chimpanzees, gorillas, and bonobos—are at particular risk. In fact, this illegal trade is destroying free-ranging populations of chimpanzees just when it has been proposed that their protection in the wild may be important for understanding how to control the spread of HIV and other emerging infectious diseases in humans.

Moreover, the killing and dressing of chimpanzee meat in the bush may present a human health risk for those engaged in this trade and is a potential point of entry for new diseases into the global human population.

Therefore, this group of concerned organizations and individuals is united in calling for immediate steps to halt the negative consequences of the illegal commercial trade in endangered and threatened species. The most pressing of these steps is the need for a wide array of mechanisms for public education in Africa and throughout the world as to the causes, consequences, and appropriate solutions to this crisis. This public education campaign should begin as soon as possible.

The governments of developed nations and, in particular, multilateral aid agencies, should redouble their commitment to conservation and sustainable development in tropical African countries. They, along with corporate donors and foundations, should provide the human and financial resources necessary to seek workable solutions. Central and West African governments and conservation organizations have helped to establish a network of protected areas. However, there is presently inadequate political will and financial support to maintain a viable protected area system. Until responsible environmental action is a condition for international development loans and financing, until African governments take full responsibility for enforcing existing laws and

maintaining vigilance against corruption, and until policy makers put the value of protecting wildlife ahead of immediate financial gain, there will be no way to stem the loss of tropical Africa's irreplaceable biological heritage, including our closest living relatives, the great apes. Logging companies, mining firms, and other extractive industries bear a significant responsibility for the growth of the unregulated commercial bushmeat trade. They must ensure that illegal hunting of threatened and endangered species is prohibited in their concessions and minimise their impact on wildlife by providing alternative sources of food for their employees. They should also do all they can to contribute to equitable, transparent, and lasting solutions.

All of the organisations and individuals endorsing this statement will ensure that a common response to both the conservation and medical challenges is built upon a foundation of respect for the people who live in the areas in question. Solutions to the current bushmeat crisis must be developed in co-operation with the citizens of Africa, with their needs and aspirations in mind. This is especially important given that bushmeat has provided and continues to provide an important food source for the rural inhabitants of bushmeat trade countries.

Over the next several weeks and months, a Task Force will be formed to work with other organisations to better define both the immediate, as well as the medium and long-term components of this important campaign. In the meantime, we will be working with like-minded organisations throughout the world to help respond to this crisis. There is hope for a solution but action must be taken soon.

RESEARCHERS PIN DOWN ORIGIN OF AIDS VIRUS

Scientists announced at the end of January that they had traced the origin of the AIDS virus to a subspecies of chimpanzee in West Africa. Researchers at the University of Alabama believe a simian virus resembling HIV jumped from primates to humans and then mutated into its current lethal form. The researchers said the simian virus is closely related to HIV-1, the strain of AIDS virus that has caused most cases of the disease in the world. The chimpanzee virus is known as SIVcpz, for simian immunodeficiency virus chimpanzee.

Because monkeys are apparently able to carry the virus without falling ill, scientists hope the discovery will eventually help to improve therapies and develop an effective vaccine against HIV. Since humans and chimpanzees are 98 percent identical in their genetic

makeup, studying the animals' immune system may give clues as to how to prevent and treat the infection in people.

"We want to focus on the naturally infected animals ... and then study them side-by-side with humans looking at a number of immunological parameters," Beatrice H. Hahn, one of the researchers, told the *Washington Post*. Hahn described the study in the keynote address at the Sixth Conference on Retroviruses and Opportunistic Infections in Chicago on Jan. 31, and the results were published in the Feb. 4 issue of the journal *Nature*.

Virologists had long suspected that HIV came out of Africa through human contact with one or several species of chimps or other primates, but they lacked sufficient proof to establish the link with confidence. About a year ago, however, Hahn and her team, including scientists at the University of Nottingham in Britain, began studying the virus isolated from a chimp named Marilyn that died in childbirth in 1985. Tissue was taken from Marilyn and put into a freezer at a National Cancer Institute Laboratory in Fort Detrick, Maryland. It remained there for 10 years and was almost thrown out when Hahn said she wanted to test it.

Hahn's team used a technique called polymerase chain reaction, or PCR, to recover the virus from the tissue and to identify it as a chimpanzee virus. By sequencing parts of the virus's genetic material, the scientists discovered that more segments of the simian and human virus overlapped than had been identified in three previous simian viruses isolated from other chimpanzees in recent years. In addition, the researchers realised that Marilyn was from the *Pan troglodytes troglodytes* subspecies, which has a natural habitat that coincides with the region in central West Africa where HIV-1 was first recognised. Hahn and her colleagues believe it was passed from chimps to humans three separate times in a small region of western equatorial Africa about 50 years ago before spreading to an estimated 50 million human carriers today.

The researchers think humans were infected by the primate virus through blood contact during the hunting and slaughtering of the chimps for food in the region of Gabon, Equatorial Guinea and Cameroon, on Africa's Atlantic Coast. Contact between the animals and humans has increased because of a growing interest in the killing of primates for human consumption and the incursion of roads into remote areas, mainly for use by logging trucks. People who once hunted to feed themselves are now slaughtering chimpanzees and other primates for sale in the "bushmeat trade."

Hahn and her colleagues said they were dismayed to learn of the extent of that trade and the threat it posed to the survival of chimpanzees. They are concerned that slaughter of the chimps may make it

difficult to study the natural course of the virus in the wild. "We cannot afford to lose these animals, either from an animal conservation or a medical investigative standpoint," she told the *New York Times*.

Scientists warn that more deadly germs and viruses may surface as humans are exposed to animals in the wild that previously had been isolated from most human contact. The advance of civilisation into other deeply forested regions is likely to generate other viral exposures.

The latest findings have implications that go beyond AIDS. Dr. Harold W. Jaffe and Dr. Thomas M. Folks, two leading AIDS researchers at the Centers for Disease Control and Prevention, said determining the source of the AIDS virus might also help scientists learn how to identify novel microbes earlier and possibly prevent similar diseases from becoming epidemic. As Jaffe told the *New York Times*, "If this kind of transmission happened in the past, is it continuing to go on?"

[Source: *Foundation for Biomedical Research NEWS*, Vol XVI: 1, Jan/Feb 1999. Web site: www.fbresearch.org]

WILDLIFE OFFICIALS NOW GORILLAS' WORST ENEMY

The old adage of killing the goose that lays the golden eggs could soon hold true for the Uganda Wildlife Authority (UWA). Corruption in the organisation is endangering the country's most prime tourism segment, the tracking of mountain gorillas.

Gorillas in Bwindi Impenetrable and Mgahinga Gorilla national parks are being subjected to too many tourists who flock in illegally. A dangerous practice has emerged in the gorilla parks where multiple tracking is being carried out by unscrupulous park staff.

At the new tariffs which became effective this October, UWA is able to earn, in both gorilla tracking permits and park entry fees, over US\$ 1.6 billion a year from the two parks.

But all this income could also be in danger if illegal tracking ruins this popular tourism segment. Illegal tracking could ruin the gorillas that everyone wants to see at least once in their lifetime.

The cost of a single gorilla tracking permit shot from US\$ 175 to US\$ 250 for Bwindi and from US\$ 125 to US\$ 175 for Mgahinga beginning October, 1998. Tourists are allowed to view the gorillas for one hour and at a distance of five metres.

Equally, the amount of bribery that goes on between gorilla-mad tourists and corrupt park staff, sometimes, can be as much as US\$ 1,000, according to sources

from the tour companies.

The demand for gorilla trekking is so great that tourists are lining up to buy permits a year in advance. For gorilla groups whose viewing is not certain, like the newly habituated in Bwindi, permits are sold on standby.

And for Karengyere group in Mgahinga, that keeps moving across the Uganda-Congo border, the booking has been restricted to three months in advance.

The country's smallest national park, Mgahinga, takes in six gorilla viewers per day, while the neighbouring Bwindi takes in ten tourists per day currently.

And the number is expected to go up soon in the latter after the ongoing habituation of new gorilla families is complete.

UWA's Acting Executive Director, Dr. Yakubo Moyini, recently admitted there was a lot of illegal gorilla tracking taking place in two national parks. And reliable sources from the wildlife agency indicate the practice has been going on since the start of gorilla tourism in the two parks.

In an e-mail message to Safari Nzuri, which wanted to know about the story of illegal tracking that had been published by the reputable *National Geographic*, UWA's Visitor/Commercial Services Coordinator, Ms Lillian Ajarova, said in May that Mgahinga rangers were most notorious for illegal gorilla tracking.

"In Mgahinga the temptation to receive bribes has been extreme because the wardens reside in Kisoro Town, leaving rangers alone in the park premises," she said.

However, park wardens would not be residing in Kisoro town if US\$ 114m from the United States Agency for International Development (USAID) and about US\$ 9m counter-funds from the government meant for the construction of the park headquarters was not diverted by UWA's predecessor, the Uganda National Parks.

Mgahinga is very vulnerable to illegal gorilla tracking because it is less than an hour's walk to encounter the world's most coveted apes in the misty volcanic mountains—the Virungas.

Information from tour operators and within UWA indicates that up to three groups of visitors go into the park to view a group of gorillas a day. It is also said more tourists than the stipulated number are taken to view a single group of apes.

Unscrupulous rangers allow visitors to get close to the apes and stay longer than the stipulated one hour, further increasing the danger of disease infection to the gorillas.

According to UWA sources, a meeting of UWA officials held at the end of August, at Buhoma in Bwindi, a senior warden said double tracking was an emerging problem in the park "like in Mgahinga."

The meeting was so candid and revelations were

made about multiple tracking in Bwindi. For instance, it was disclosed that illegal tracking had taken place in Bwindi on July 18 and 19, and on August 26 and 27. Two junior staff were implicated.

UWA headquarters confirmed information from the Buhoma meeting that on 23 September, a representative of a tour agent in Kampala had been intercepted taking 12 gorilla trackers into Bwindi at a go. The tour agent is said to be operating a briefcase business in Bwindi with the full knowledge of UWA bosses.

The Buhoma meeting further heard that on 22 September, 16 tourists were found at River Munyanga Water Falls trail without a guide late in the evening. On the evening of the following day, 11 tourists were found going for a self-guided trail, and when they were followed, they hid in the thick vegetation of the forested park. "UWA staff are bribed by tourists who fail to get gorilla tracking permits to conduct private trips," said the UWA boss. But he too accepts that low pay for field staff is one of the major causes of illegal tracking.

Even in prime national parks such as Bwindi and Mgahinga, the rangers are a miserable lot, with poor wages and inadequate accommodation.

As many as ten rangers share a single [room]. Already a number of rangers and other park workers suspected of involvement in illegal gorilla tracking have been arrested and prosecuted. Several others have been dismissed, says Dr Moyini. However, the bribery money is so much that park workers cannot resist temptation.

With Mountain gorilla tourism facilities closed off in the Congo and Rwanda because of insecurity, there is intense pressure on gorilla viewing in Uganda. Thus, gorilla tracking permits in the Virunga Mountain Ranges have been reduced from 60 to only 16, and available only in Uganda.

The pressure encourages protectors of the world's most endangered species to break rules.

The situation has been complicated by back-packers who drive their trucks to the gorilla sanctuaries without trekking permits and have to wait for any available permits sold on standby. And few permits are sold on standby.

UWA says sometimes there are 40-50 over-landers waiting on the fringes of the parks for a rare chance to see a gorilla. "There is big money and many people involved," confesses Dr. Moyini. Gorilla viewing is so exciting that some tourists are prepared to part with anything to see the world's largest apes. "Temptation among over-landers to bribe park workers to see gorillas is quite high," says the UWA boss.

Nevertheless, unscrupulous rangers use the pretext of taking tourists for nature walks to smuggle in gorilla viewers. UWA's reaction has been swift. It has banned nature walks in Mgahinga, and soon, nature walks in Bwindi will be banned.

In some cases, uncouth tour agents go along the border with neighbouring communities and eventually link up with corrupt park workers and sneak into the parks. In the case of Mgahinga, they travel along the Congo border and eventually enter the park, again with the help of rangers.

In search of the mighty dollar, workers in Mgahinga and Bwindi parks take in illegal gorilla trackers very early in the morning and use ungazetted routes to come out. Private trips in the Bwindi and Mgahinga may not stop abruptly until all the factors are examined. However the looming catastrophe of putting the animals on stress and possible disease infections could wipe out gorilla tourism.

Uganda accounts for about a half of estimated 600 Mountain gorillas remaining in the wild. But it seems that gorilla tourism which has been hailed as a success in eco-tourism is turning into eco-terrorism.

Ndyakira Amooti

[source: *New Vision*, 24 November, 1998, p. 28]

GORILLA PERMITS STOPPED

Kampala - The Uganda Wildlife Authority (UWA) has abolished standby gorilla viewing permits to curb illegal tracking, officials have said.

UWA's deputy director in-charge of field operations, Mr Arthur Mugisha, said yesterday they had also banned nature walks in the Mgahinga Gorilla National Park, and restricted them in the Bwindi Impenetrable National Park. "Forest walks will be conducted in Bwindi only after we have made sure gorillas are not outside their home ranges, deep inside the forest," Mugisha said.

The decisions were reached during a meeting of senior staff Monday to discuss recent press reports of rampant multiple tracking in the mountain gorilla sanctuaries. Ten gorilla viewers are allowed in Bwindi per day, while Mgahinga takes in six.

Accompanied by the visitor co-ordinator, Lillian Ajarova, Mugisha confirmed recent press reports that unscrupulous park staff were taking advantage of nature walks and standby permits to conduct private gorilla tracking besides the official trips. The meeting set up a sub-committee to advise the organisation on how to sell off the permits that have been hitherto sold under the standby arrangement.

The committee was expected to report back today. Mugisha also attributed rampant illegal tracking to delays in UWA restructuring which has caused a lot of uncertainty and anxiety.

He said poor remuneration has worsened the

situation, to the extent that it is more paying to receive a bribe and face a sack than being faithful and remain in employment. UWA headquarters will now be monitoring all the tourists going to Bwindi and Mgahinga from Kampala to ensure there is no build-up of large numbers of tourists.

Ndyakira Amooti

[source: *New Vision*, 3 December 1998]

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Many of these already exist, but are usually omitted from statistics. Their status varies and further work is needed to address legal and voluntary frameworks for such networks. The relationship between strict protected areas and managed resource areas has to be determined at a national level; the latter should not be used as an excuse to avoid establishing fully protected areas. Governments should also be involved in supporting, and where appropriate, regulating, non-governmental protected areas. Emphasis on unofficial reserve systems is probably most appropriate in those countries where protection of ecosystems on state land is already well advanced. It is particularly important in countries where no further expansion of traditional protected areas is possible without competing for land with human groups.

Management of protected areas

Protected areas management is currently in crisis. Many areas designated for protection in the 1980s are, despite decisions taken at government level, continuing to be exploited, degraded and destroyed.

Several reasons can be identified, including

sometimes government complicity and corporate greed. One fundamental problem has been a general failure of governments, conservation authorities and NGOs to understand local peoples' role within conservation areas. Many reserves have been set up on peoples' traditional lands, or on areas that were used for hunting, fuelwood and forage collection, or for cultural purposes. Looking at the role of people in protected area management should be a key priority for the future.

A number of approaches can help relieve tensions between rural dwellers and protected areas:

- a greater emphasis on participatory and co-management approaches;
- approaches that allow controlled use of resources and ensure that protection is not automatically equated by local people with loss of customary rights;
- strategies to involve local people in spin-off benefits of protected areas through income from tourism;
- flexibility in control of reserves, to include workers, local people and others in management decisions;
- further development of the concept of buffer zones around reserves, to take the pressure off protected areas.

New approaches towards protected area management should involve the principle of stewardship, and a partnership between local people and others in management. This does not mean a loss of the basic rights of people to manage their own land and may, indeed, increase people's rights to police the management of land under local protection.

Conclusions

A future global or regional strategy for expanding and improving a system of protected areas depends on three main factors:

- making sure that existing protected area networks are effective, through improved management and greater local participation;
- broadening the scope of protected areas to allow people at all levels of society to join in the protection of biodiversity;
- extending official protected area networks.

During 1996 and 1997, WWF International will be co-ordinating a research project on issues of protected areas, including particularly the relationship between protection and local people.

Gonzalo Oviedo & Nigel Dudley

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[source: *Arborvitae*, 3, 1996]

INTERNATIONAL FOREST NEGOTIATING PROCESS: OPPORTUNITIES AND LIMITATIONS

The following observations on the Second Session of the Intergovernmental Panel on Forests are from Dr Mark Dillenbeck of IUCN.

The Intergovernmental Panel on Forests (IPF) met for its second session from 12-22 March 1996 at UN headquarters in Geneva. At the conclusion, it was still unclear to most participants where the process was heading. There is no collective vision emerging regarding the real nature of the problem of forest loss and what the global community should do to address this. Nonetheless, some positive ideas and trends emerged.

It seems unlikely that there will be a proposal for a global forest convention, although some delegates still support this, or that the IPF will be able to define, much less address, many causes of deforestation. Important underlying causes such as debt servicing, structural adjustment and over-consumption of wood products, seem to be receiving short shrift. Important direct causes such as commercial logging and unplanned forest conversion are also receiving inadequate attention. The IPF is hampered by its political nature and is not proving to be an optimal forum for technical debate. The eleventh hour effort by the G-77 countries to block the adoption of the Co-Chairs' reports was a discouraging indicator of the difficulties.

On the positive side, the meeting suggested an emerging paradigm shift in thinking about forests. There were repeated interventions in support of participation of local communities and indigenous people in forest management, and recognition of forests' non-timber values. It is probably safe to predict that there will be significant concrete actions resulting from the process, if only because governments have invested too much to allow the IPF to fail. These actions may include:

- agreement on a new approach to global forest assessment;
- improvements in defining and implementing criteria and indicators for sustainable forest management;
- better coordination among multilateral organisations dealing with forests; and,
- greater clarity on the roles of existing international agreements and conventions, and the identification of possible gaps.

One possible output could be an agreed action programme to complement and operationalise the Forest Principles and relevant sections of Agenda 21. The mechanism might be a joint forest action committee whose members would include representatives from international and multilateral agencies and organisations working on forest

conservation and sustainable forest management.

Although many governments entered the IPF process in good faith, the process is yielding lessons in its limitations. What can the IPF actually do? It can make recommendations which will be forwarded to the Commission on Sustainable Development (CSD), which will report to the UN General Assembly in June 1997. If it is successful, the IPF can help create an international policy and institutional environment which is more supportive of forest conservation and sustainable development.

The IPF represents a water shed. It will either lead us on a path towards an effective framework for international collaboration or towards disillusionment. Even in an optimistic scenario, it will teach us about the limitations of the UN/CSD processes. These limitations suggest the need simultaneously to pursue a variety of alternative approaches involving a diversity of players to be followed at global, regional, national and local levels.

A major thrust of IUCN support for the IPF is the Community Involvement in Forest Management Initiative (CIFM). The objectives of the initiative are as follows:

- Inform country and NGO delegates to the IPF regarding world-wide experiences with community involvement in forest management.
- Influence the IPF debate by (a) advocating specific recommendations in support of community forest management to be included in the final IPF Co-chairs' report to the Commission on Sustainable Development, and (b) by intervening in the technical discussions of the IPF to elucidate how improved community collaboration and stakeholder participation can improve forest management and tenure systems; and,
- Accelerate learning among countries which have demonstrated commitment to CIFM by catalysing a formal process for exchange of information regarding policies, programmes and implementation activities.

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[source: *Arborvitae*, 3, 1996]

"EVALUATING EDEN"

The International Institute for Environment and Development (IIED) has initiated a 3 year research program to investigate and evaluate the environmental, social and economic dimensions and impacts of community wildlife management (CWM) initiatives in

developed and developing countries, and examine the conditions which contribute to successful CWM. At this stage, they are seeking to identify institutions and individuals who are:

- working in the field of community wildlife management;
- involved in research which is relevant to the work undertaken;
- involved in, can let them know about, or can provide information about community wildlife management projects and initiatives in particular countries/regions; or
- interested in collaborating with IIED in this program.

Contact: Dr Barry Dalal-Clayton, Director, Environmental Planning Group, International Institute for Environment and Development, 3 Endsleigh St, London WC1H 0DD, UK, Tel: 44-171-388-2117, Fax: 44-171-388-2826, E-mail: iiedwildlife@gn.apc.org

RAINFOREST RELIEF

Rainforest Relief works to protect the world's remaining tropical and temperate rainforests by reducing the demand for the products and materials of rainforest destruction such as timber, agricultural products such as bananas, beef, coffee, chocolate, and cut flowers, and mining products such as gold, oil and other metals. Contact: P.O. 150566, * Brooklyn, N.Y. 11215, USA, Tel/Fax: a1-718-832-6775, E-mail: relief@igc.apc.org

CITES, THE TIMBER TRADE & CONSERVATION



Tropical moist forests harbour millions of years of ecological heritage, containing almost 90% of the world's species of fauna and flora. Yet there is an estimated loss of 20,000 to 100,000 species world-wide each year, the majority of them native to tropical rainforests. This poses an unmeasurable threat to both the ecological and economical wealth of tropical nations. For example, in 1994, the World Bank estimated that the annual financial loss from deforestation alone of one major timber exporting country in West African was \$5,000,000,000.

CITES—the first step towards safeguarding natural resources

The Convention on the International Trade in

Endangered Species of Wild Fauna and Flora (CITES) has been ratified by 123 countries, many of whom are major exporters and importers of timber. CITES offers all those concerned with the threat of declining natural resources an effective means to monitor, control, and manage these resources. In doing so, it enhances other international agreements, such as the International Tropical Timber Agreement (ITTA).

Appendix II—a valuable conservation tool for the timber trade

Appendix II listing offers exporting and importing countries a powerful tool to increase control over the trade and conservation of their natural resources. The implications of successfully implemented Appendix II listings are that:

- the exporting country has at its disposal, at a powerful government-level, international sanctioning of trade with which to oversee the monitoring, trade and management of its own natural resources;
- through the regulatory requirements for listing on Appendix II, trade would be controlled to a level whereby Appendix I listing would not be necessary, thus exporting countries can ensure unsustainable exploitation is avoided;
- improved information (facilitated by the issuing of export permits) on the conservation status, source, volume and species of timber being traded, becomes more readily available both to exporting countries and the international timber trade;
- Appendix II provides a clear separation between legal and illegal trade, the latter of which costs exporting countries millions of dollars in lost revenue each year;
- Appendix II listing improves the collection of royalty payments of exporting countries' authorities, thereby improving opportunities for the implementation of sustainable forestry;
- CITES is a dynamic process whereby species listed on the Appendices can be, and are, either delisted or uplisted as their trade and conservation status changes;
- Appendix II will demonstrate to the international timber trade and consumers world-wide the commitment of exporting and importing countries to sustainable trade in timber species;
- exporting countries are more readily able to implement their own domestic trade and conservation legislation.

Appendix II is not a trade ban

Unlike Appendix I, which is reserved for species threatened with extinction and where trade is strictly regulated and only permitted in special circumstances, trade in species listed on Appendix II requires an export permit to be issued by the exporting country. Appendix

II contains species which "...although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilisation incompatible with their survival..." (CITES, Article II(2a)). Appendix II also contains species where trade needs to be controlled due to their similar appearance to other species already listed.

[source: excerpted from a Fauna & Flora International flier]

TIMBER TRADE UNDER SCRUTINY

The timber trade is arguably one of the most significant causes of forest degradation and loss world-wide. Temperate, tropical and boreal forests are all under pressure from both local and international interests because of direct timber exploitation as well as encroachment resulting from logging roads and camps. Threats to the world's natural forests directly related to timber trade not only include the loss of species and genetic material, but also soil erosion and a decreased ability to function as effective watershed catchments.

The TRAFFIC Network began its work on the timber trade in 1990 amid increasing evidence of illegal and unregulated trade in timber, much of which comes from natural rather than plantation forest. In keeping with TRAFFIC's expertise in trade monitoring, three specific areas were identified for the Network's efforts. These are:

- increasing the transparency in the trade by collecting information on timber trade routes, markets, prices and trading practices
- documenting illegal and fraudulent practices in the timber industry
- improving the quality of data on the individual species appearing in the trade, so that monitoring can be improved.

Since 1990, various TRAFFIC offices have carried out research within these three focal areas. The activities to date are diverse, and include in-depth country profiles and analysis of particular species. Trade reviews of particular note include TRAFFIC India's effort to document the trade in agarwood *Aquilaria malaccensis*, a tree that occurs in India and parts of South-east Asia. Its timber is harvested to extract a product resulting from fungal infestation of the heartwood. Agarwood is highly sought after and regarded as threatened throughout much of its range.

TRAFFIC India documented the unsustainable trade in agarwood, particularly the trade in its resinous wood chips and oil used primarily as perfume in the

Middle East. The findings, published in the TRAFFIC India report *Trade in Agarwood* in 1994, were instrumental in providing quantitative data to support the tree's inclusion in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1994. The CITES listing requires member countries to regulate trade in this tree species and its products.

Also of interest is a country study undertaken by TRAFFIC East/Southern Africa to document the trade in hardwoods in Kenya. This study included the collection of information on species in trade, trade routes, markets, the forests where the timber originated, and the volume of timber appearing in trade both from Kenyan forests and from the neighbouring countries of Uganda and Tanzania. While Kenya's forest area is shrinking rapidly because of the conversion of land for agriculture and settlement, the timber trade plays a significant role in its degradation.

This work by TRAFFIC East/Southern Africa complemented the efforts of a variety of institutions concerned with forest conservation by quantifying the trade, documenting trade dynamics and by making recommendations for future courses of action to make Kenya's hardwood timber industry sustainable. The findings were published in the 1994 *Species in Danger* report, *Hard Times for Hardwood: Indigenous Timber and the Timber Trade in Kenya*.

Efforts to document the illegal practices in the timber industry have been spearheaded by a TRAFFIC Oceania project in the Asia-Pacific region. The project, which focused on Indonesia, Malaysia, Myanmar, Papua New Guinea, the Philippines and Thailand, enabled TRAFFIC Oceania to document many illicit trade practices. These included illegal logging, timber smuggling, undervaluing, misclassification of species, and transfer pricing. The latter involves buying or selling goods at below-market prices, with an intention to maximise profits in the country of import and/or transfer profits to a country with lower tax rates. The findings, published in the 1992 *Species in Danger* report, *Illegal Tropical Timber Trade: Asia-Pacific*, brought needed attention to the situation. They highlighted how illegal practices were costing the producer countries millions of US dollars in tax revenue and also undermining efforts to develop sustainable forestry management in the region.

TRAFFIC has also been involved in the policy arena, most notably in the CITES context. All TRAFFIC offices participate in the review of proposals to amend the Appendices prior to a meeting of the Conference of the Parties to CITES. In 1994, this effort was devoted to several timber species and genera traded in large volumes, such as the mahoganies (*Khaya* spp., *Swietenia marophylla*, *Entandrophragma* spp.), as well as other species traded in lesser quantities, such as African blackwood *Dalbergia melanoxylon* and mun

ebony *Diospyros mun*. TRAFFIC also prepared a guide on CITES and tree species for the 1994 CITES meeting on behalf of WWF-UK. The work on these species has extended beyond the Conference of the Parties to CITES, with staff continuing to collect data on the species mentioned above.

The Network also participates in the CITES Timber Working Group, which was established at the 1994 Conference of the Parties to address implementation of the convention with regard to timber species. The group will meet twice and then present its findings and recommendations at the Tenth Meeting of the Conference of the Parties to CITES.

At the Timber Working Group's first meeting in November 1995, the group reviewed the trade in the tree species listed in Appendices II and III. It discussed the control and identification of derivatives and parts of certain tree species. In addition, the group discussed the potential contribution of various international organisations to the CITES process as it relates to tree species, and reviewed mechanisms to improve the co-ordination and consultation between these groups and CITES.

The discussions resulted in a number of recommendations that were presented in 1997. In regard to parts and derivatives, the group developed definitions for logs, sawed wood and veneer sheets, and agreed upon standard reporting units for these items and others, such as wood carvings and furniture. The group also decided to recommend that all CITES permits and certificates, invoices and bills of lading should include scientific names to facilitate identification of species in trade.

Numerous recommendations were agreed upon regarding issues of implementation. These include the modification of permitting procedures to accommodate timber trade practices, such as placement of shipments in bonded warehouses or the export of a shipment from a country before designating a buyer. Issues to be addressed at the next meeting of the working group will include the disposal of confiscated timber and other implementation issues.

TRAFFIC's ongoing projects on the timber trade include an analysis in South Africa of the trade in wood carvings, many of which are imported from West Africa for sale in tourist curio shops. Efforts are under way to identify the native species utilised, quantify the trade and also assess the trade in imported species—an exciting challenge given the diversity of carvings available on South Africa's market. This project marks TRAFFIC's first examination of the wood carving trade. However, the scope will not be restricted to South Africa. Plans are under way to address the trade in the Pacific region, an area with a tradition of carving and an increasing rate of forest loss.

In the future, TRAFFIC plans to carry out additional trade reviews of species valued by the timber

industry, and will continue to use its expertise in supporting the work of CITES. More country studies are expected as well.

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[source: *TRAFFIC Dispatches*, May 1996]

GLOBAL FOREST PROTECTION VS. THE NEW WTO AGENDA

The world's forest are on the chopping block at the World Trade Organization (WTO). When trade ministers meet in Seattle at the WTO's Third Ministerial, November 30 - December 3, 1999, they plan to introduce a sweeping new agenda to increase worldwide consumption of wood products, open up native forests to logging, weaken environmental protections, and open the door to invasive species. The most urgent initiative is a new forest products agreement that U.S. Trade Representative Charlene Barshefsky told Congress is a top negotiating priority. A number of other agenda items could have even greater impacts on forests. Advising her are executives from Weyerhaeuser, Boise Cascade, International Paper, and Georgia-Pacific. No one representing protections for forests or workers is at the table. Below is an overview of the new WTO Agenda for forests.

Stimulating Demand for Wood Products

New Forest Agreement: The U.S. is pushing to complete by December a new agreement on forest products separate from the broader WTO agenda so as not to get bogged down. The agreement focuses on reducing what the industry considers "barriers to trade." The result will be cost reductions for wood products consumers, stimulating demand and intensifying logging. While the current scope of talks covers only tariffs (import taxes), negotiations are expected to introduce "non-tariffs," which can refer to anything, even environmental laws. The U.S. and other big exporters want total elimination of tariffs on wood products worldwide, particularly in the enormous Japanese and Korean markets. Regarding non-tariffs, of most concern to forest protection advocates are things such as customs procedures at national borders intended to prevent the entry of invasive species. "Bioinvasion" is now the second leading cause of species extinction in the world, after habitat

destruction. Also, the timber industry is targeting local building codes that require the use of non-wood materials; their elimination could further stimulate demand for wood products. Non-tariff measures are not yet officially on the table, but industry leaders are preparing to introduce them.

Weakening Protections against Invasive Species

The WTO sets strict limits on what governments can do to prevent the entry of invasive species via a binding agreement known as the Sanitary and Phyto- Sanitary, or SPS, Agreement. While the SPS Agreement currently forbids countries from enacting some of the most effective safeguards that could minimize bioinvasion risks, the U.S. and other countries are advancing proposals that could make even existing safeguards challengeable (illegal) as a barrier to trade. Another emerging form of biological pollution, the unregulated spread of genetically-modified organisms (GMOs), is under discussion at the WTO. The increasing use of genetically-modified varieties of tree seeds poses risks to native forests, where unwanted GMOs may migrate, further mutate, multiply, or transfer to other organisms and species, often with unpredictable results. Proposed rules for the trade in biotechnology products would prevent governments from taking measures to stop GMOs from entering their country.

Opening Up Native Forests

Logging corporations are increasingly going abroad in search of larger forest reserves and less costly labor and environmental regulations. The WTO is preparing to introduce a broad agenda to protect such foreign investments. Among the ideas being advanced is that of National Treatment, which would require nations to treat foreign investors on the same terms as domestic ones. Brazil, Russia, Mexico, and other countries with significant tracts of native forests have traditionally limited foreign access to natural resources to prevent their exploitation from being determined by absentee owners. WTO investment rules would institutionalize "cut-and run" logging around the world and prevent governments from favoring local entities which may tend to be more accountable to the land and its inhabitants.

Weakening Environmental Protections

Also on the investment agenda is a new definition of "expropriation" that would allow foreign investors to sue governments for passing legislation that reduces profits from a planned investment. If approved, new government measures to protect forests (or anything in the public interest) could be challenged as an illegal "expropriation" that requires full cash compensation to the foreign investor. Known by critics as the "Pay

the Polluter" principle, the WTO's proposed investment rules would send a chill over new environmental protections around the globe.

Threatening Certification Initiatives

American industry is feeling a real squeeze from competitors who operate in countries with little or no environmental regulation or enforcement. Realizing that they cannot compete on such unequal terms, they now want to create a set of harmonized global rules to "level the playing field." If adopted, industry-set standards would lock-down weak protections in countries where there is major logging of native forests still to be done (Mexico, Chile, Brazil, Indonesia, Russia, etc.), while opening up stronger protections (such as those in the U.S.) to challenge under the WTO. The WTO has undertaken a broad discussion on adopting industry-defined standards through the International Standards Organization (ISO), and is also considering eco-labeling rules that could define some certification schemes as potential barriers to trade.

Jobs, Jobs, Jobs?

U.S. industry will try to promote the wood products agreement as a jobs-creating initiative for Americans, although the dynamics of globalized trade and production dictate that few new jobs will actually come of it. Department of Commerce statistics show that as wood products exports have increased from the U.S., employment in the sector has decreased. This relationship undermines the conventional wisdom that increased exports create more jobs. What's going on? As companies compete more directly in globalized markets, they are automating production (which requires less workers) to increase their competitiveness. As of 1996, the Department of Labor's Trade Adjustment Assistance program had certified over 5,500 U.S. workers in the forest products sector who have lost their jobs as a result of the North American Free Trade Agreement (NAFTA).

Victor Menotti

Director of the International Forum on Globalization Environment Program

WWF'S POSITION ON INDIGENOUS PEOPLES AND CONSERVATION

In April 1996, after a year of internal consultation, WWF officially adopted a statement of principles—*Conservation with Indigenous Peoples—Principles for partnership between WWF and indigenous peoples' organisations in conserving biodiversity within*

indigenous peoples' lands and territories, and in promoting sustainable use of natural resources—the first comprehensive WWF institutional position adopted on this issue.

The basic assumption is that recognition of indigenous peoples' rights is a precondition for them to help conserve biodiversity, and that a partnership approach will generally benefit the environment. The statement is divided into three sections: Rights and Interests of Indigenous Peoples, Conservation Objectives, and Principles for Partnership. Issues include: ownership rights, primary rights of indigenous peoples in cases of conflicting claims, rights to exert territorial control, prior informed consent on actions relating to indigenous peoples' territories, and intellectual property rights. WWF commits itself to seeking partnerships with indigenous peoples to conserve biodiversity. The dynamic nature of the document is stressed; revisions will be needed as further lessons are learnt in the future.

Copies available from: Gonzalo Oviedo, WWF International, Avenue du Mont-Blanc, 1196 Gland, Switzerland, Tel: 41-22-3649524, Fax: 41-22-3648219, E-mail: odette.jonkers-hueber@ian.wwf.ch

VORTEX—POPULATION VIABILITY ANALYSIS

Dr. Robert Lacy announces the creation of a VORTEX e-mail discussion group (listserv). The VORTEX Listserv will facilitate the exchange of ideas, questions, answers, and suggestions among the many users of the VORTEX population modelling program. It was created because questions were frequently received about the use of VORTEX, as well as suggestions for changes from users. Often several people asked similar questions (the manual is a bit sparse on technical details), and it was assumed that many other people were facing similar problems without knowing how to obtain an answer. Helpful hints were also received from users about efficient ways to use the program. People are using various versions of VORTEX (the most recent is Version 7.0), and with this listserv it will be possible to make announcements of updates, bug fixes, and suggestions.

To sign up for the VORTEX Listserv, send an e-mail message to: vortex-request@bio-3.bsd.uchicago.edu The subject of the message should be just the word SUBSCRIBE. After signing up, it is possible to send messages to the list at: vortex@bio-3.bsd.uchicago.edu (note that this address is slightly different from the one to which the initial subscribe request is sent). Messages will be distributed to everyone on the list. The list is unmoderated and open

to anyone who wishes to participate. As list administrator, Robert Lacy will eliminate and permanently block any subscribers who send offensive messages, extraneous messages that would obviously be of no interest to VORTEX users, or advertisements for products (other than perhaps VORTEX add-ons and upgrades). Feel free to make suggestions about the listserv itself. Please send in questions, suggestions, reports of exciting applications of VORTEX, or anything which would be of particular interest to other VORTEX users, or simply sign up and passively watch the flow of ideas contributed by others.

To unsubscribe, send a message with Subject: UNSUBSCRIBE to vortex-request@bio-3.bsd.uchicago.edu

Setting up this Listserv was possible due to the generous help of the Academic Computing Center of the University of Chicago Biological Sciences Division.

Contact: Robert C. Lacy, Department of Conservation Biology, Brookfield Zoo, Brookfield, Illinois 60513, USA, Tel: 1-708-4850263, Fax: 1-708-4853532.

POPULATION AND HABITAT VIABILITY ASSESSMENT (PHVA)

Introduction

The Population and Habitat Viability Assessment (PHVA) workshop has become an important component of the Conservation Breeding Specialist Group's (CBSG) tool kit of scientifically-based conservation processes. In this contribution, I will provide a brief overview of the basic premise and characteristics of the PHVA workshop.

The PHVA process

Stated very simply, the PHVA workshop is designed to assist in the development of comprehensive management plans for a single given species or population, as well as that species' or population's corresponding habitat. From the more narrow perspective of population biology, the PHVA is the estimation of extinction probabilities by analyses that incorporate identifiable threats to population survival into models of the extinction process. Information on the life history, population dynamics, ecology, and distribution of the focal species or population is assembled and analysed at the workshop and it serves as input to the simulation models that assess both current persistence as well as the consequences of alternative management strategies proposed at the workshop.

An important feature of these workshops is the extraction, assembly and assessment of information from the species experts present at the workshop. Much

of this information, as much as 75–80%, is not readily available in published form but it may be of decisive importance in understanding the population dynamics of the species in the wild. Moreover, the social structure of the PHVA workshop provides a neutral environment within which individual participants' agendas are set aside and mutual problem-solving is fostered in the development of species management programs.

Broad And Diverse Participation: A Cornerstone Of The PHVA Process

A defining characteristic of the PHVA process is the broad base of individual and institutional participation at each and every workshop. All those people with a stake in conservation of the species in question are invited to actively participate in the workshop. For example, a total of more than 200 people from nearly 110 institutions participated in the eight PHVA workshops conducted by the CBSG between September 1994 and September 1995. This social environment facilitates the discussion of many difficult topics related to species management, and it ultimately results in a strong sense of participant ownership of the workshop product. This sense of personal ownership in a proposed conservation strategy has enormous impact on the subsequent implementation of that strategy.

PHVA Facilitator's Training Workshops

There is a projected need for hundreds, if not thousands, of PHVA workshops to be conducted globally over the next decade. Existing CBSG staff can participate in only a small fraction of these workshops; consequently, a strategy to contend with this shortfall is to train people around the world to do this work. One of the primary areas of emphasis for CBSG for the next 2–3 years is training additional workshop facilitators and population biologists to meet this need.

One of the primary products to come out of the first workshop in Minnesota in 1994 was what we call the *PHVA Process Design Manual*. This manual provides a detailed guide to the steps necessary to successful organisation and implementation of a PHVA workshop. In addition, the authors of the manual, all with considerable experience in the PHVA workshop process, address many of the difficult issues, both biological and otherwise, that commonly surface during the course of a workshop. It is a valuable document that can be used by anyone organising or facilitating a PHVA workshop.

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[source: CBSG News, Vol. 6, No. 1, 1995]

AMERICAN SOCIETY OF PRIMATOLOGISTS' POLICY STATEMENT ON THE LONG- TERM CARE OF CHIMPANZEES AND THEIR INVOLVEMENT IN SCIENTIFIC RESEARCH

- Whereas chimpanzees are present in the US in research centres, zoological gardens, and other settings outside their natural habitat; and
- Whereas large-scale reintroduction of captive-born chimpanzees to natural habitat is not presently feasible nor likely to become feasible in the near future; and
- Whereas chimpanzees are members of the species most closely related and biologically similar to humans; and
- Whereas chimpanzees require high quality medical care, secure and complex physical facilities, and social and psychological stimulation; and
- Whereas much valuable information regarding health and behaviour can be learned from studies of chimpanzees of all ages; and
- Whereas convenience euthanasia is generally considered inappropriate for great apes and maintenance of chimpanzees under appropriate conditions is costly;

The American Society of Primatologists recommends:

- That efforts should be made to provide secure and appropriate environments for captive chimpanzees in zoological exhibits, research facilities, retirement facilities, and sanctuaries;
- That humanely conducted scientific studies of chimpanzees throughout the life span should be encouraged and federally supported, especially research on development and ageing processes and other topics that may contribute not only to the understanding of human health and behaviour, but also hold promise for improving the health and quality of life of chimpanzees;
- That tissues of chimpanzees should be preserved following death for additional study, including brain tissues in a comparative neurobiology research resource bank similar to those maintained for the study of human neuropathology;
- That regulations be advanced to permit chimpanzees to reside exclusively in accredited zoological parks, accredited research facilities, or other situations that are USDA licensed and subject to regulation under the Animal Welfare Act;
- That additional wild-caught chimpanzees not be imported (in accordance with current policies) and that a national chimpanzee registry be created to assure that the individual identity and location of

all chimpanzees is known as a means of improving enforcement of laws and regulations intended to eliminate illegal trade or holding of chimpanzees and other primates.

This statement was reviewed by the Research and Development Committee of the American Society of Primatologists (ASP) and Society's Board of Directors. The Board of Directors officially approved this policy statement in its present form on 12 August, 1996.

REDEFINING WHAT ZOOS DO: THE CHANGING PHILOSOPHY OF THE ZOO- AQUARIUM PROFESSION



American Zoo and Aquarium (AZA) member zoos have

transformed themselves. Since 1972, mainline institutions have changed from living museums, sometimes a bit shallow or even competitive in their outlook, into remarkably collaborative and increasingly proactive institutions emphasizing conservation as well as education. Many have moved beyond their institutional fences to pursue wildlife preservation and education programs directly in the homes of the creatures they exhibit. Such broad self-improvement achievements are probably unparalleled in the museum field, and zoo and aquarium exhibits are beginning to reflect the transformation.

Six AZA milestones clearly illustrate the evolution of a philosophy of collaboration and professionalism, and a broadening definition of conservation in the zoo profession:

- 1972 AZA develops a self-administered accreditation program
- 1975 School for Professional Management begins
- 1976 Code of Professional Ethics adopted
- 1981 Species Survival Plan begins
- 1982 Requirement for common animal records (ISIS) adopted
- 1993 Field Conservation Committee established

While the direction of change in the profession's thinking during the last 25 years was influenced by the accelerating pace of worldwide development and the newly perceived inevitability of the loss of much of the world's fauna, it also reflected the prospect that zoos, despite their limitations, would be the final homes for an increasing number of species. It was becoming clear that the zoo's reason for being was evolving and that zoos and aquariums are different from other kinds of educational or cultural organisations whose exhibits do not die or are not threatened with extinction.

Our society needs to make little sacrifice to save art or music; no long-term commitment to a future which might seriously affect our personal access to the land and its resources; to pieces of the economic pie. But, to save wildlife, we must sacrifice the opportunity to consume or destroy it. Far more than most of the art and literature of our time, to say nothing of our more trivial entertainments, wildlife science, education and conservation resonate with moral purpose and importance, with wholesome aims and prospective significance. Inevitably, this makes its contemplation uncomfortable. It is becoming ever more clear that zoos and aquariums have a special responsibility to help define, create and sustain values affecting wildlife and wilderness. Nevertheless, the collaborative philosophy adopted by the zoo profession is not a small thing. Its SSP provides an especially impressive example.

By collaboratively managing the demography and genetics of the zoo populations of selected species, the SSP seeks to assure their long-term viability and to provide, where practicable, animals for conservation studies and reintroduction. In creating the Species Survival Plan, zoos made their first priority the well being of the species. In essence, they placed animals under the management of elected colleagues—regardless of ownership. Such collaborative and altruistic professional and institutional behaviour is extraordinarily rare in any endeavor—to say nothing of conservation activities. In the course of these efforts, the profession also can be observed seeking to establish sound science in the zoo philosophy driver's seat.

The increase of zoo *in situ* conservation programs in the 1990s, symbolised by AZA's Field Conservation Committee and Conservation Action Partnerships, signals further philosophical change in our field, from inward looking collection orientation to inclusion of *in situ* wild animal populations and their habitats. Today's zoos seem destined to become proactive environmental organisations whose services to society are increasingly in keeping with the focus of their collections. Nearly a dozen of the 180 AZA accredited zoos and aquariums now have full-time staff to manage conservation granting programs for *in situ* work, and more than three dozen have such programs with part-time staff.

Increasingly, new zoo exhibits mirror the philosophy and current concerns of a new zoo profession. More and more displays and education programs are constructed with conservation themes. Besides, zoo-aquarium animal keeping has evolved, taking advantage of new understandings in animal behaviour, propagation and care. A panoply of new materials and technologies have become available to address the live animal exhibit challenge: to provide for the long-term well being of zoo animals while inspiring zoo-goers with wonder, filling them with information and moving

them to conservation action—the last a new fundamental in zoo philosophy.

William Conway, Wildlife Conservation Society

[source: AZA *Communiqué*, September 1997]

HUNTING/BUSHMEAT BIBLIOGRAPHY

Persons concerned about great apes and other endangered animals are invited to use and contribute to a working bibliography being developed on hunting and bushmeat commerce in West and Central Africa. With over 200 entries, this already may be the largest organised reference list on these topics. However, it is far from finished. More input is needed to make this a comprehensive tool which can be used to substantiate and direct programs to stop the commercial slaughter of endangered animals for their meat.

A first draft of the bibliography can be accessed now through the web page at <biosynergy.org/bushmeat/>. Future drafts will include annotations, additional references, and new sections. Some material will be omitted and much more added. Unpublished talks and position papers will eventually be separated from published work. The quality and usefulness of this tool will depend in large part on your support.

Authors who have done work in areas related to hunting and bushmeat commerce are hereby urged to send us your citations and abstracts. Persons familiar with written work on these topics are invited to contribute titles and brief annotations describing the materials and how to access them. Anyone with ideas for expanding the topics covered, please send your recommendations. If you have a bibliography on these topics, please contact us so we can merge the works and include you in the list of "compilers".

Contact: Anthony L. Rose, The Biosynergy Institute/Bushmeat Project, P.O. Box 488, Hermosa Beach, CA 90254, USA, Tel: 1-310-379-1470, Fax: 1-310-379-7042, E-mail: biblio@biosynergy.org

AFRICAN PRIMATES HOME PAGE

<http://www.primate.wisc.edu/pin/newslett.html>

Thanks to the collaboration of the staff of the library of the Wisconsin Regional Primate Research Center, Madison, as from Vol.1(1), July 1995, *African Primates* is included amongst the newsletters available in the Primate Info Net (PIN) on the Internet World

Wide Web. Unfortunately, the electronic edition will lack graphs, tables, maps and photographs due to the considerable investment of time required for their independent formatting in HTML, but the texts of the articles and news items, and the listings of recent publications and meetings, are all reproduced in their entirety. Thanks are due to Larry Jacobsen, Sue Carlson, Melinda Carr and Ray Hamel of the Wisconsin Regional Primate Center.

Other newsletters currently available in the WWW Primate Information Network include: *Neotropical Primates*, *Asian Primates*, *Australian Primatology*, *AWIC Newsletter*, *Chinese Primate Research and Conservation News*, *Clara Clarion*, *Gorilla Conservation Newsletter*, *IPPL Quarterly Newsletter*, *Laboratory Primate Newsletter*, *Laboratory Primate Newsletter Archives*, *Old World Monkey TAG Newsletter*, *ONCenter* (Oregon Regional Primate Research Center), *Pan Africa News*, *Primate Library Report: Audio-Visual Acquisitions*, *PSYeta Newsletter* (July 1995), and *Sulawesi Primate Newsletter*.

WILDLIFE ECOLOGY DIGEST SUBSCRIPTION

This is a weekly e-mail digest for research, conservation, job opportunities, issues, thoughts, and general postings concerning wildlife ecology. To receive this free, e-mail digest, send e-mail to: kingfshr@northcoast.com with the subject: "Subscribe to WED," followed by your correct e-mail address. Your first issue will arrive soon after that. See their web site at <http://home.aol.com/wedigest> for more information on this service (plus over 200 links to other wildlife/ecological web sites).

MULTIMEDIA GUIDE TO THE NON-HUMAN PRIMATES

Dr Frances Burton has created a CD-ROM about the primates of the world. The *Multimedia Guide to the Non-Human Primates* is a fascinating educational tool and would be of great value to government officials in checking shipments of hard-to-recognise primates. Dr Burton spent five years on this project. The CD-ROM provides detailed information on over 200 species of nonhuman primates, in categories such as features, habitat, diet, communication, and social dynamics. The package consists of the CD-ROM, a Users' Guide and a separate print volume.

The CD-ROM has generated enthusiasm among

teachers. Eduardo Fernandez-Dubuque of the University of California, Davis, commented: 'I am not aware of any other tool like this for teaching primatology. I would definitely use it in my courses. It is fun for students—it is challenging.'

Available in either Windows 95 (stock number 014-207-1681) or Macintosh (ISBN: 0-13-210899-2) versions from the publisher. Price: U.S. \$64.00. *Order from:* Prentice Hall, 111 Tenth Street, Des Moines, IA 50395, USA, Tel: 1-800-288-4745, Fax: 1-515-284-2607.

NEW WILDLIFE LISTSERVER

A new listserver to facilitate discussions on a variety of topics related to natural resource information management has been established. Emphasis is on fisheries and wildlife applications. This new resource should improve communications, allow for the quick dissemination of news items and job announcements, and help biologists gain access to experienced peers. Topics include: GIS, database management, the Internet, radio telemetry, global positioning systems, remote sensing, data collection, and other computer applications. This listserver was established by Dave Morton and Jeff Waldon at the Fish and Wildlife Information Exchange, Department of Fisheries and Wildlife Sciences, Virginia Tech.

To Subscribe, send an e-mail message to: listserv@listserv.vt.edu with the following message in the body: `subscribe fwim-1 <yourfullname>`. You will receive additional instructions on sending messages and subscription options. *Contact:* Dave Morton, Tel: 1-540-231-7348, E-mail: dmorton@vt.edu

PRIMATOLOGY ON THE WORLD WIDE WEB

A number of primate research and conservation resources are now available on the World Wide Web. All of the following URIs (WWW addresses) begin with "http://" which has been omitted to save space.

African Ape Fieldsites

<http://weber.ucsd.edu/~jmoore/apesites/>

African Primates at Home:

www.indiana.edu/~primate/primates.html

American Society of Laboratory Animal

Practitioners:

netvet.wustl.edu/aslap.html

- American Society of Primatologists:
www.asp.org
- American Zoo and Aquarium Association:
www.ccilink.com/aza.html
- Animal Behaviour:
www.cisab.indiana.edu/animal_behavior.html
- Animal Behavior Society:
www.clarku.edu/~rking/abs.html
- Animal Research Database:
www.fcs.uga.edu/~mhulsey/GDB.html
- Animal Welfare Institute:
www.animalwelfare.com
- Animal Welfare Act, Amendments and Regulations:
netvet.wustl.edu/awa.htm
- Ask-Primate
www.primate.wisc.edu/pin/askprim.html
- Audiovisual Services:
www.primate.wisc.edu/pin/av.html
- Berggorilla & Regenwald Direkthilfe:
www.kilimnjaro.com/gorilla/brd/
- Biosynergy Institute:
biosynergy.org/bushmeat
- Budongo Forest Project:
units.ox.ac.uk/departments/bioanth/budongo.html
- California Regional Primate Research Center:
www.crprc.ucdavis.edu/crprc/homepage.html
- Careers in Primatology:
www.primate.wisc.edu/pin/careers.html
- Center for Field Research/Earthwatch:
www.earthwatch.org
- Centers for Disease Control and Prevention (CDC):
www.cdc.gov
- Cites:
www.unep.ch/cites.html/
- Congo and Cameroon bushmeat problem:
www.kilimanjaro.com/wsapa/slaughte.htm
www.way.net/wsapa/wsape/html
- Consortium of Aquariums, Universities and Zoos:
www.selu.com/~bio/cauz/
- Darwinian Notions:
chimp.com
- Dian Fossey Gorilla Fund:
deathstar.rutgers.edu/projects/grorilla/gorilla.html
- Directory of Graduate Programs in Primatology and Primate Studies:
www.brown.edu/Research/Primate/dir96.html
- Electronic Zoo/NetVet:
netvet.wustl.edu/primates.htm
- Emerging diseases:
ichi-ban.objarts.com/out-break-unreg/index.html
- Emerging Infectious Diseases:
www.cdc.gov/ncidod/EID
- Graduate Programs in Primatology:
www.brown.edu/Research/Primate/dir98.html
- German Primate Center:
www.dpz.gwdp.de
- Gorilla Conservation News:
anthro.usdaivs.edu/gcn
- Gorilla Foundation:
www.gorilla.org/
- Gorillas:
www.selu.com/~bio/gorilla/index.html
- Great Ape Project:
envirolink.org/arrs/gap/gaphome.html
- Great Ape Project-International:
www.envirolink.org/orgs/gap/
- Institute for Laboratory Animal Research (ILAR):
www2.nas.edu/ilarhome/
- International Council for Laboratory Animal Science:
uib.no/vivariet/iclaswww/iclashomepage
- International Directory of Primatology:
www.primate.wisc.edu/pin/idp.html
- International Gorilla Conservation Programme:
www.panda.org/research/igcp/igcp.htm

International Primate Protection League:
sims.net/organizations/ippl/ippl.html

International Primatological Society:
www.primate.wisc.edu/pin/ips.html

International Union for the Conservation of Nature
and Natural Resources:
www.iucn.org/

Jane Goodall Institute:
www.gsn.org/proj/jgi/inex.html

Kilimanjaro Travel Gorilla Help Site:
www.kilimanjaro.com/gorilla/

Lab Animal:
www.labanimal.com/col/reg3.html

Laboratory Primate Newsletter:
www.brown.edu/research/primate

Mammal Species of the World:
nmnhgoph.si.edu/msw/index.html
www.nmnh.si.edu/msw

Measuring Behaviour '96 Workshop Proceedings:
www.diva.nl/noldus/mb96.html

National Center Research Resources (USA):
www.ncrr.nih.gov/

National Institutes of Health (NIH):
www.fda.gov

National Zoo photo library:
www.si.edu/natzoo/photos/phoset.html

Natural History Book Service:
www.nhbs.co.uk/

Net Vet Primates:
netvet.wustl.edu/primates.html

New Improved Enrichment Index:
www.brown.edu/Research/Primate/enrich.html

NIH/NCRR Primate Centers Program:
www.primate.wisc.edu/pin/nihncrr.html

Oryx:
www.blacksci.co.uk/products/journals/oryx.htm

Pan Africa News:
jinrui.zool.kyoto-u.ac.jp/pan/home.html

People Against Chimpanzee Experiments:
users.ox.ac.uk/~mckee/pace

PIN Meetings Calendar:
www.primate.wisc.edu/pin/calendar

Primate Cytogenetics Network:
ial.fhcrc.org/pcn/primatcytonet.html

Primate Gallery (including sound and movies):
ial.fhcrc.org/primategallery/primategallery.html
www.selu.com/~bio/PrimateGallery/mail.html

Primate Info Net:
www.primate.wisc.edu/pin

Primate Information Center:
www.rprc.washington.edu/pic.htm

Primate-jobs:
www.primate.wisc.edu/pin/jobs

Primate Network:
www.oz.net/~primate/

Primate Newsletters:
www.primate.wisc.edu/pin/newslett.html

Primate Research Centres other than NIH/NCRR:
www.primate.wisc.edu/pin/otherctr.htm

Primate Society of Great Britain:
www.ana.ed.ac.uk/psgb/

Primate-Talk:
www.primate.wisc.edu/pin/ptalk.html

Primatologie:
Inf.cnrs-mrs.fr/lnc/primatologie.html

Save the Colobus Monkeys in Diani, Kenya:
www.ni.net/brookhouse.com/DianaG/WildSide/Monkey.html

Smithsonian Tropical Research Institute:
www.se.edu/organiza/centers/stri/

Species Survival Commission:
www.iucn.org/themes/ssc/index.html

Taxonomic Classification of the Primates:
www.primate.wisc.edu/pin/amnattax.txt

Travelers' Information:
www.cdc.gov/travel/travel.htm

Undergraduate Programs in Primatology:
www.primate.wisc.edu/pin/aspunder.html

VetBase:
oslovet.veths.no/databasesintro.html £ VetBase

Wildlife Ecology Digest:
home.aol.com/wedigest

World Conservation Monitoring Centre (WCMC):
wcmc.org.uk

World Directory of Primatologists:
www.primate.wisc.edu/pin/wdp.html

WRPRC Library and Information Service:
www.primate.wisc.edu/pin/pamphlet.html

WWF Global Network:
www.panda.org

Yerkes Regional Primate Research Center:
www.emory.edu/YERKES/

Zoological E-mail Directory:
www.indyzoo.com/zed/

ZooNet:
www.mindspring.com/~zoonet/

PRIMARILY PRIMATES, INC.

Primarily Primates, Inc. is a unique non-profit animal protection organisation that provides sanctuary, rehabilitation, lifetime care and shelter to various non-native species of primates, birds, mammals and reptiles that would otherwise die prematurely by abandonment or euthanasia. The sanctuary is located on 9 acres in Leon Springs, 19 km north of San Antonio in the Texas Hill Country. This area's mild year-round climate is ideal for the various types of animals residing here.

Primarily Primates, founded in 1978, has grown from a facility caring for three monkeys to its present community of more than 400 primates, 150 birds and various mammals. The animals come from abusive backgrounds or situations in which they are no longer wanted, such as former pet homes, zoo surplus, victims of laboratory research or animal acts no longer useful to the entertainment industry. A large percentage of these individuals are threatened or even endangered species.

Primarily Primates specialises in the care and treatment of monkeys and apes. Due to the animals' unstable and often unhealthy background, many have severe physical or psychological problems. Some of the

animals at the sanctuary have not interacted with other primates since they were infants. Upon arrival, they are examined for health problems and evaluated for their potential to cohabit with others of the same species, so that they may eventually learn proper primate behaviour.

Primarily Primates attempts to resocialise its charges. Social contact is very important among primates for normal emotional development. Animals which have become too "humanised", or have been too isolated to function normally as monkeys, are introduced into their species social groups. Once it has been determined that an animal can coexist with others, it is placed in a large natural habitat with companions of its own species. Here the animals can live out the rest of their natural lives in a more stress-free environment. Through coordination with other organisations, such as the International Union for the Conservation of Nature and Natural Resources, we are actively searching for ways to eventually return some of the animals to their native habitats.

Primarily Primates also performs as part of a network for information on animal care, endangered species husbandry, various animal welfare issues, details of cruelty cases, *etc.*, for zoos, wildlife authorities, animal protection groups, individuals and others who request our help, locally, nation-wide and internationally.

Contact: Wallace Swett, Director, Primarily Primates, Inc., PO Box 15306, San Antonio, TX 78212-8506, USA, Tel: 1-210-755-4616, Fax: 1-210-755-2435, E-mail: primprim96@aol.com

WWF SEEKS ENVIRONMENTAL SCHOLARS

The World Wide Fund for Nature (WWF) has launched a major site on the World Wide Web. A subsection of the WWF site includes a searchable interdisciplinary database of scientists, faculty, and experts in environmental fields entitled 'Environmental Scholars' which helps a cross-section of scholars network and share information. This database allows users to search by keyword and locate one another. If you would like to be included in this database, e-mail the following information to wwfnetwork@newmedium.com to:

Name
 Department
 College/University/Organisation
 Address
 Phone/Fax
 E-mail address(es)
 Research areas/Topics of interest

In your message, please use "environmental scholars" as the subject line, and type each field entry

on a separate line. The last field entry can be up to a paragraph in length, including, among other information, your area of specialisation, current research topics, educational background, current or upcoming publications, requests for assistance/documents from other users, *etc.*

PRIMATE VOCALISATIONS

The Wisconsin Regional Primate Research Center (RPRC) Library makes a concerted effort to collect, catalogue, and make accessible a wide range of recorded primate vocalisations. Without an effort to conserve this material, which may ultimately be the only audio-visual documentation of some endangered primates, these important vocalisations may be lost. "Whether you have one call or a full repertoire available, we would like to hear about your work. If you have audiotaped vocalisations you could contribute, we would like the best quality copies available. If you cannot part with the original recording, we accept copies which we may retain. We also have the facility to make copies. This process usually takes 2 weeks, after which the original is returned to the contributor. If you are planning any future research which may involve taping vocalisations, please keep us in mind. Any help in pointing us toward potential sources of material would also be appreciated." *Contact:* Ray Hamel, Special Collections Librarian, Wisconsin RPRC, 1223 Capitol Ct, Madison, WI 53715, USA, Tel: 1-608-263-3512, Fax: 1-608-263-4031, E-mail: hamel@primate.wisc.edu

GORILLAS IN TRADITIONAL AFRICAN CULTURE: A REQUEST FOR INFORMATION

I am collecting information for an article that I am writing for the next issue of "Gorilla Journal". I am reviewing the importance of gorillas in traditional African culture, especially their use for medical and religious purposes. It is difficult to find material on this subject in the literature. I am, therefore, searching for unpublished information.

I would be very grateful for any reliable contribution—with location, name of the people, and as many details as possible. I will, of course, fully acknowledge anyone who provides me with useful information on this topic.

Contact: Dr. Angela Meder, Berggorilla & Regenwald Direkthilfe Augustenstr, 122 70197 Stuttgart, Germany, Fax: 49-711-6159919, E-mail: angela.meder@t-online.de

MIMICRY IN PRIMATES

Clara Jones is seeking any information, speculations, anecdotes, *etc.* regarding mimicry in primates (including social mimicry, as in social parasitism). "I am especially interested in receiving feedback about observations that are *not* included in Napier and Napier (1967), in Wickler's work, and in my *Neotropical Primates* note (1995). I am also interested in any cases of developmental mimicry, for example, delayed maturation in male mantled howler monkeys, who resemble adolescent females. I appreciate and will acknowledge any responses." *Contact:* Clara B. Jones, 1406 East Front St, Plainfield, NJ 07062, USA, E-mail: cebus@intac.com

NEW CITES CHECKLIST



The new *Checklist of CITES Species* has been published in the three working languages of the Convention on International Trade in Endangered Species. Its production is supported by the CITES Secretariat, at the Joint Nature Conservation Committee of the UK and the European Commission. It was produced by the World Conservation Monitoring Center (WCMC), Cambridge, as part of its support for CITES. The checklist provides alphabetical listings of the species of fauna and flora on Appendices I, II, and III of CITES. It is hoped that this will be an aid to management and scientific authorities, customs officials, and all others involved in enforcing the convention.

Available from: CITES Secretariat, Case Postal 456, CH-1219 Geneva, Switzerland, Tel: 22-979-9139, Fax: 22-797-3417, E-mail: cites@unep.ch

AMERICAN SOCIETY OF PRIMATOLOGISTS—BOOK SERIES



The Publications Committee of the American Society of Primatologists (ASP) are accepting book proposal applications for their newly established book series. Each volume will be based on an organised symposium from an ASP meeting and/or special topic in primatology. Income from books published by ASP will be used for fundamental purposes of the Society (*e.g.*, Conservation Fund, educational development). The inaugural volume, entitled *Primate Conservation*:

The Role of Zoological Parks, is based on a symposium presented at the ASP Congress in 1995. **Contact:** Janette Willis, Department OB/GYN, OUHSC, Box 26901, Oklahoma City, OK 73190, USA, Tel: 1-405-271-4229, Fax: 1-405-271-8547, E-mail: janette-wallis@uokhsc.edu

PAN AFRICA NEWS

The Editors of *Pan Africa News* gather information from any person working in research and conservation of *Pan* species (chimpanzees and bonobos) in Africa. Specifically, they welcome information on:

- conservation status, habitat destruction and other risks such as diseases, poaching and the pet trade;
- interim reports on ongoing research on wild chimpanzees and bonobos, and anecdotal news;
- activities or projects for orphaned chimpanzees;
- problems threatening coexistence of research, conservation and tourism;
- methodology: new field techniques, habituation, experiences encouraging local people to co-operate;
- announcements of research opportunities, staff recruitment, meetings, newsletters, postcard or T-shirt sales to raise funds;
- any opinions and remarks about the journal.

Contact: T. Nishida, Laboratory of Human Evolution Studies, Department of Zoology, Faculty of Science, Kyoto University, Sakyo, Kyoto 606-01, Japan, Tel: 81-75-753-4085, Fax: 81-75-753-4115, E-mail: pan-editor@macaca.zool.kyoto-u.ac.jp

FUNDING AND TRAINING

SI/MAB BIODIVERSITY PROGRAM—ANNUAL COURSE “BIODIVERSITY MEASURING, MONITORING, AND RESEARCH CERTIFICATION”

The Smithsonian Institution/Man and the Biosphere (SI/MAB) Biodiversity Program holds an annual course, “Biodiversity Measuring, Monitoring, and Research Certification” at the Smithsonian Conservation Research Center, Front Royal, Virginia. This intensive 5-week course provides a unique opportunity for professionals to gain expertise in current methodology for developing, carrying out and maintaining long-term biodiversity inventory, monitoring and research programs. Over 110 participants from 45 countries have been trained

through this course. The training will assist the participant to incorporate his work and ideas within the measuring and monitoring framework established by SI/MAB. In addition, techniques and examples of other biodiversity monitoring programs will be discussed. **Contact:** SI/MAB Biodiversity Program, Smithsonian Institution, S. Dillon Ripley Center, 1100 Jefferson Drive S.W., Washington, DC 20560, USA, Tel: 1-202-357-4792, Fax: 1-202-786-2557, E-mail: ic.simab@ic.si.edu Web Site: <http://www.si.edu/organiza/musuems/ripley/simab>

BREEDING AND CONSERVATION OF ENDANGERED SPECIES—JWPT SUMMER SCHOOL

The Summer School “Breeding and Conservation of Endangered Species”, of the Jersey Wildlife Preservation Trust (JWPT), Jersey, is suitable for students, zoo and veterinary staff, and others with an interest in conservation and captive breeding. The course offers an overview of how the JWPT and other organisations have integrated conservation in captivity and the wild, lectures, study projects, practical instruction and workshop sessions, and other demonstration sessions by zoo staff invited experts. The Course Directors are the Trust Training Officer, Dr John E. Fa, and two internationally recognised scientists. The course tutor is Dr Anna Feistner, Trust Research Officer, and the coordinator is Mr Chris Clark, Assistant Training Officer. **Contact:** The Summer School Co-ordinator, Jersey Wildlife Preservation Trust, Trinity, Jersey JE3 5BP, Channel Islands, British Isles, Tel: 44-1534-864666, Fax: 44-1534-865161.

CHICAGO ZOOLOGICAL SOCIETY SMALL GRANTS

Every June, the Chicago Zoological Society awards small grants to a number of field conservation projects. The proposals are considered by the Society's Endangered Species Fund Advisory Committee and approved by its Board of Trustees. The Committee requests proposals from IUCN/SSC Specialist Groups for projects that are contained in final or draft Action Plans. While projects found in Action Plans will be considered, the proposal would need to document that the project is a formal priority of the Specialist Group.

Grants will be in the range of US\$ 1000–3000. Preference will be given to complete projects of this size but the committee will consider proposals that are part of a larger project (\$10,000 range). Groups should only submit projects where there is a high likelihood that they will be implemented within 1–2

years if they were to receive support from this fund.

Proposals should be just one page in length, and should describe the research project, including the budget and a brief background description. The proposal should clearly demonstrate that the project is a priority for the Specialist Group, referencing an Action Plan where appropriate, and be submitted on behalf of the Group. If additional background material on the project is available, please provide that as well. The Committee makes the grants available in the middle of July and would like a progress report, if not a final report, on the project by the following June. Proposals are due May 1. *Contact:* Elizabeth McCance, (preferably by e-mail iucnss@igc.apc.org) Chicago Zoological Society, Brookfield, IL 60513, USA, Tel: 1-708-485-0263 ext 304, Fax: 1-708-485-6320.

RIVERBANKS CONSERVATION FUND

Riverbanks Conservation Support Fund Awards which were recently established will be in the \$100-\$1,000 range. The following types of requests will be considered for funding: AZA Conservation Committee (SSP, TAG, CAP, SAG) projects identified as priorities in AZA-endorsed Five Year Action Plans; AZA Conservation Committees (other requests); outside agencies (USFWS, State Wildlife Agencies, etc.); and individual researchers. The deadline for applications is February 1. *Contact:* Ed Diebold, Director of Animal Collections, Riverbanks Zoological Park, P.O. Box 1060, Columbia, SC 29202, USA, Tel: 1-803-779-8717, Fax: 1-803-256-6463.

THE CHARLOTTE CONSERVATION FELLOWSHIP PROGRAM

Dedicated to the deep and abiding passion of Charlotte Kidder Ramsay for the animals and people of Africa, the Charlotte Conservation Fellowship Program of the African Wildlife Foundation (AWF) is committed to enhancing the effectiveness and impact of African nationals in the field of conservation through the increased knowledge, skills and the credentials obtained through an advanced degree.

Charlotte Conservation Fellowship Program offers full scholarships for Masters degree candidates, or field research/partial funding for Ph.D. candidates in the subject areas of Species and Ecosystem Conservation, Community Conservation and Resource Economics. The programme is open to degree programmes (both full time and distance-learning) that overlap these topics as well. In each subject area, the applicants are required to show that their proposed studies will produce knowledge offering solutions or insight into specific conservation challenges. Special consideration

is given to studies that complement AWF's conservation interests, or those of another conservation institution, as this provides an institutional context for maximising the impact of the results. However, self-identified applicants not linked to an institution are also encouraged to apply. Focal countries for this year's programme are Kenya, Tanzania, Uganda and South Africa.

The expenses and materials covered under the scholarship vary depending on the individual programme elected by the Charlotte Fellow. The maximum value of each scholarship is US\$ 25,000. The Charlotte Conservation Fellowship Program is committed to promoting equal opportunities and women are encouraged to apply.

All Charlotte Fellow applicants must:

- Be nationals of any of the four focal countries, aged 21-40 years of age
- Have secured a place at an appropriate university
- Have exemplary work experience that indicates a commitment to conservation or a good first degree
- Have an anticipated programme of study or research plan in the focal subject areas which has a direct and relevant link to conservation
- Have outstanding motivation and commitment to conservation in Africa
- Have the desire to remain working in African conservation

Contact: The Charlotte Conservation Fellowship Program, African Wildlife Foundation, P.O. Box 48177, Nairobi, Kenya, Tel: 254-2-710367, Fax: 254-2-710372, E-mail: awfnrb@awfke.org

LINCOLN PARK ZOO SCOTT NEOTROPIC AND AFRICA/ASIA FUNDS

The Lincoln Park Zoo Scott Neotropic and Africa/Asia Funds support field research in conservation biology around the world. The Africa/Asia fund, launched in 1997, focuses on projects throughout Africa, Asia, and the Pacific.

Each fund supports projects of young conservation biologists and between five and 15 projects for each fund are supported each year. The fund awards are seldom greater than US\$ 7500, and most awards fall in the range of \$ 3000-\$ 6000. Initial support is for up to 12 months from the date of award, and the maximum duration of support is two years. The Africa/Asia proposals have no deadline for 1999. *Contact:* Steven D. Thompson, LINCOLN PARK ZOO SNF/AA FUNDS, Director of Conservation and Science SR, Lincoln Park Zoo, 2001 N. Clark Street, Chicago, IL 60614, E-mail: steved@ix.netcom.com, Web site: www.lpzoo.com

JOBS

PRIMATE WORK IN AFRICA: ENDANGERED SPECIES REHAB IN NIGERIA & CAMEROON

Qualified personnel urgently needed at the following facilities to serve as project supervisors and technical advisors:

Drill Rehabilitation & Breeding Center - Cross River State, Nigeria

Founded in 1991, the DRBC maintains over 60% of the world's captive drill population (74 drills) in natural-sized reproductive groups of wildborn founders and captive bred drills. The project also maintains 16 non-breeding chimpanzees. Project emphasis is on conservation and technical aspects of group formation, breeding and preparation for future release back to the wild. Most animals are relocated to a new rain forest site and are kept in multi-hectare, electrified enclosures of natural habitat. An urban facility serves as quarantine & project HQ.

Limbe Wildlife Center - Limbe, Cameroon

Founded in 1994, LWC is a rescue & rehab facility for endemic wildlife at a refurbished government zoo in a coastal resort town. LWC maintains 7 young gorillas, 23 infant-adolescent chimps, 12 drills, plus mandrills, baboons, mangabeys, guenons and miscellaneous antelopes and reptiles. Project emphasis is conservation education and continued development of the facility.

Staffing needs

Expatriate staff work as technical advisors with national staff on animal husbandry, and are responsible for daily operations, maintenance and improvement of facility, administration, and veterinary care (emergency & routine quarantine).

Work is voluntary. In Nigeria accommodation and meals are provided, and stipends may become available for exceptionally qualified people. In Cameroon volunteers must presently pay rent and buy their groceries (approximately \$200/month) simply because the project is not sufficiently funded. Volunteers in Cameroon are also largely responsible for fund-raising.

The following skills are sought (although not all are essential):

- Animal husbandry, veterinary and/or medical experience
- Practical & mechanical skills (construction, automotive, electrical, etc.)
- Educational background
- Developing country experience
- Administrative, fund-raising, and good writing skills

- Conservation or development work, particularly in Africa

These positions are very demanding, requiring determination and genuine commitment to African wildlife conservation. They are ideal for a couple with a balance of the above skills. Applicants must be at least 25 years old; people over 35 are actively encouraged!

Contact: Liza Gadsby or Peter Jenkins, Pandrillus, HEPO Box 826, Calabar, Nigeria, Tel: 234 (87) 234-310, E-mail: drill@hyperia.com or drill@infoweb.abs.net

MEETINGS

6th Congress of the Gesellschaft für Primatologie (GfP). 18-22 August, 1999, Universiteitscentrum "De Uithof", Utrecht, The Netherlands. It will be hosted by the Projectgroep Ethologie & Socio-oecologie, Utrecht University. Contact: Annet Louwerse, Liesbeth Sterck or Jan van Hooff at: GfP, Projectgroep Ethologie & Socio-oecologie, Pb 80.086, 3508 TB Utrecht, NL, Tel: +31-(0)30-2535401, Fax: +31-(0)30-2521105, E-mail: Kongr.GfP@Bio.UU.nl. All information, including deadlines, fees, registration form etc. may also be obtained via the society's web page: <http://www.dpz.gwdg.de/gfp/utrecht99.htm>.

IVth International Congress of Ales Hrdlicka "World Anthropology on the Turn of the Centuries" 31 August-4 September 1999. Prague. Organised by Charles University in Prague and Czech Anthropological Society. Contact: Dr. Marina Vancatova, E-mail: Vaclav.Vancata@pedf.cuni.cz or Web site: <http://www.natur.cuni.cz/hrdlicka>.

III Congreso de la Asociación Primatológica Española (APE), 20-22 September 1999, Universidad Autónoma de Barcelona, Spain. Contact: Secretaria del Departamento de Biología Celular e Fisiología, Facultad de Ciencias, Universidad Autónoma de Barcelona, 08193 Barcelona, Spain, Fax: 93 581 2295, e-mail: jvea@psi.ub.es

Primate Society of Great Britain Winter Meeting 1999. 1 December 1999, Institute of Zoology, London. The theme will be "Mating and Social Systems of Old World Monkeys". Suggestions for speakers and offers of posters are welcome. Contact: Dr. Caroline Ross or Mairi Macleod, School of Life Sciences, Roehampton Institute London, West Hill, London SW15 3SN, UK, Tel: 44 181 392 351, Fax: 44 181 392

3527, E-mail: c.ross@roehampton.ac.uk or m.macleod@roehampton.ac.uk

Association for the Study of Animal Behaviour, Winter 1999. 2-3 December 1999, Zoological Society of London Meeting Rooms, Regent's Park, London, UK. "Evolution of Mind". *Contact:* Karen McComb, Experimental Psychology, School of Biological Sciences, University of Sussex, Falmer, Brighton BN1 9QC, UK, Fax: 44 (0)1273 678611, E-mail: karenm@biols.susx.ac.uk

Primate Socioecology: The Role of Life Histories, 14-17 December 1999, The German Primate Center (DPZ), Göttingen. An international conference on primate socioecology. The focus of this meeting (2nd "Göttinger Freiländertage") will be on life history variation among primates. The deadline for submission of abstracts for spoken papers or posters is August 1, 1999. Guests must also register in advance by October 1, 1999. *Contact:* Peter Kappeler, E-mail: pkappeler@gwdg.de or the conference secretariat, E-mail: gft@www.dpz.gwdg.de and the conference web site: <http://www.dpz.gwdg.de/freiland.htm>

Primate Society of Great Britain—Millennium Meeting, 1 April 2000, Flett Lecture Theatre, British Museum (Natural History), London. The theme of the meeting is "Primates: Our past, their future." *Contact:* Dr. Mark Collard, Department of Anthropology, University College London, Gower Street, London WC1E 6BT, UK, Tel: 44 (0)171 380 7842, Fax: +44 (0)171 380 7728, E-mail: m.collard@ucl.ac.uk

Association for the Study of Animal Behaviour, Spring 2000. 1-19 April 2000, University of Sheffield, UK. *Contact:* Dr M. Siva-Jothy, Department of Animal and Plant Sciences, University of Sheffield, Sheffield S10 2UQ, UK, E-mail: m.siva-jothy@sheffield.ac.uk

Association for the Study of Animal Behaviour, Summer 2000. University of Cambridge, UK. Organised by Pat Bateson and Barry Keverne.

XVIIIth Congress of the International Primatological Society. Hosted by the Australian Primate Society. 7-12 January 2001, Adelaide, Australia. The deadline for submission of abstracts 31 July, 1999. *Contact:* Conventions Worldwide, PO Box 44, Rundle Mall, SA 5000, Australia, Tel: 61 8 8363 0068, Fax: 61 8 8363 0354, E-mail: satconv@camtech.net.au (sending your postal address, telephone, fax and e-mail address).

RECENT LITERATURE

NEW PRIMATE JOURNAL

A new interdisciplinary journal in primatology was recently created under the auspices of the Société Francophone de Primatologie (SFDP). The main objectives of the journal, entitled *Primatologie*, are to develop contacts between French speaking primatologists from around the world, and to promote the development of primatology in general. *Primatologie* will be published yearly. Each issue will be devoted to empirical and theoretical papers from various fields of primatology, including physical anthropology, behavioural sciences, biological and biomedical sciences, cognition, conservation, ecology, neuroscience, palaeontology, and welfare.

Papers in *Primatologie* will be primarily in French. However, in order to overcome linguistic barriers and to promote exchanges between French and English speaking primatologists, each paper will be accompanied by an abridged version of 2-3 pages in English. Occasional papers in English may also be published.

If you read French, have connections, or wish to establish connections with French-speaking primatologists, or just want to be informed about the activities of French-speaking groups, please read the *Primatologie* Web page at <http://Inf.cnrs-mrs.fr/Inc/primatologie.html> (Note the upper-case "I" at the beginning of "Inf" and "Inc")

Books

Ecology Of An African Rain Forest: Logging In Kibale And The Conflict Between Conservation And Exploitation. By Thomas T. Struhsaker, 1997, 434 pp. (ISBN 0-8130-1490-5). Price: cloth US \$39.95.

"A much-needed volume that will be of interest to a wide audience, written by a leader in the field, and one with an international reputation. The current rosy advocacy for 'sustainable development' needs a wake-up call, and this is it. This volume combines some of the hottest topics in conservation science today into a cohesive whole that looks clear-eyed into the face of modern conservation in the tropics and finds it frighteningly lacking in scientific underpinning, rational consideration, and effective implementation."—Truman Young, University of California at Davis.

This book summarises 20 years of research in the Kibale Forest in Uganda, one of the most important centres for the study of tropical rain forests in Africa.

Among the longest ongoing projects in rain forest ecology anywhere, Struhsaker's differs from the great majority of logging studies by emphasising the fauna rather than looking only at the commercially valuable timber species. By providing long-term data on a variety of plants and animals, it offers the first truly in-depth synthesis of the consequences of selective logging in the tropics. The main body of the book demonstrates the adverse effects of logging as many as 25 years after the event on community structure and numerous other aspects of forest ecology.

Although much has been claimed for the possibilities of sustainable logging in tropical rain forests, few data support these claims. Struhsaker demonstrates that future logging must be done at far lower intensities than is currently practised if intact ecosystems are to be maintained. He also offers detailed recommendations for harvest plans compatible with the conservation of biodiversity and ecological integrity.

The long-term data summarised here on the population dynamics of rain forest trees, primates, rodents, duikers, and elephants are unrivalled and will be widely cited, as will the data on seasonality, tree phenology, gap dynamics, rainfall, and temperature. Struhsaker addresses the underlying causes of tropical deforestation and concludes that although there are numerous proximate factors, the ultimate causes are rapidly increasing human populations and rates of consumption per capita. He draws comparisons with relevant studies elsewhere in the tropics and offers specific recommendations to address the problems.

Thomas T. Struhsaker has conducted field research in Africa over a period of 34 years. From 1970 through 1987 he established, developed, and directed the field research station in Kibale. He maintains an active role in Kibale today and is a research scientist in the Department of Biological Anthropology and Anatomy at Duke University. His publications include *The Red Colobus Monkey* (1975), and more than 80 scientific and popular articles and technical reports on ecology, conservation, and animal behaviour.

Available from: University Press of Florida, 15 NW 15th Street, Gainesville, FL 32611-2079, USA, Tel: 1-352-392-1351.

The Kingdon Field Guide To African Mammals. By Jonathan Kingdon, 1997, 465 pp (ISBN 0-12-408355-2). Price: paper US\$ 39.95, UK£ 29.95.

"This is quite simply a superb and authoritative work by an author of unsurpassed credentials and talent for his task. Everybody will delight in it." Mark Page, *Nature*

Jonathan Kingdon, one of the foremost authorities on African mammals, has both written and illustrated this entirely new field guide which sets new standards

in African mammalogy. All the known species of African land mammals are covered in a concise text providing full identification, distribution, ecology, evolutionary relationships and conservation status. The focus is always on the mammals as seen in the field, and on their ecology and evolutionary interrelationships. Introductory profiles summarise the characteristics of the various mammal groups. Coverage of several of the more complex groups of small mammals is simplified by reference to genera, though all 1150 African species are listed.

The most up to date classification and species list is employed. Twelve newly recognised species of bushbaby, 14 newly named baboons, guenons and mangabeys, and nine newly recognised colobus monkeys contribute to the most modern possible treatment of the primates. New species of bats, rodents and fox are also included, as well as a fully revised listing of the duikers, squirrels and genets.

Kingdon combines his long personal experience of Africa and his artistic talent with the best that modern natural history and biological science can offer. With over 480 colour pictures, and 280 maps covering some 460 mammal species or species groups, this book will be an essential companion to all those visiting Africa or with an interest in the mammals of the continent.

Available from: Academic Press, 525 B Street, Suite 1900, San Diego, CA 92101-4495, USA, E-mail: rvulture@iafrica.com Web site: <http://www.apnet.com>

Primate Conservation: The Role of Zoological Parks. Edited by Janette Wallis. 1997. Price: US\$ 25.00. (ISBN 0-9658301-0-1)

This book provides detailed descriptions of *in situ* primate conservation projects sponsored by U.S. zoological parks. As the first volume in the American Society of Primatologists' (ASP) Book series, "Special Topics in Primatology", edited by H. Dieter Steklis, it will be a valuable asset to conservationists, zoo personnel, and all primatologists working to strengthen the relationship between university researchers and zoo biologists in primate conservation.

Contents: Forward-Russell A. Mittermeier; Preface-Janette Wallis; From Ancient Expeditions to Modern Exhibitions: The evolution of primate conservation in the zoo community-Janette Wallis; The role of North American zoos in primate conservation-Robert J. Wiese and Michael Hutchins; Zoos and *in situ* wildlife conservation-Fred W. Koontz; The conservation role of primate exhibits in the zoo-Kenneth C. Gold; Multi-disciplinary strategic planning for gibbon conservation in Thailand and Indonesia-Ronald Tilson, Katherine Castle, Jatna Supiatna, Kunkun Jaka Gurmaya, Warren Brockelman, and Schwann Tunhikorn; Developing a conservation action

program for the cotton-top tamarin (*Saguinus oedipus*)-Anne Savage, Humberto Giraldo, and Luis Soto; Steady-state propagation of captive lion-tailed macaques in North American zoos: A conservation strategy-Donald G Lindburg, John Iaderosa, and Laurence Gledhill; Partners in conservation: establishing *in situ* partnerships to aid mountain gorillas and people in range countries-Charlene Jendry; Bonobo conservation: The evolution of a zoological society program-Gay E. Reinartz and Gilbert K. Boese; Drills (*Mandrillus leucophaeus*): Research and conservation initiatives, 1986-1996-Cathleen R. Cox; The Gateway Zoo Program: A recent initiative in golden lion tamarin reintroductions-Tara Stoinski, Benjamin Beck, Mary Bowman, and John Lehnhardt; Zoo-based conservation of Malagasy prosimians-Sukie Zeeve and Ingrid Porton; Appendix: Primate conservation resources on the World Wide Web. All profits from the sale of this book will go to the ASP Conservation Fund.

Available from: Steve Schapiro, ASP Treasurer, UTMD Anderson, Science Park, Rt. 2, Box 151-B1, Bastrop, TX 78602, USA.

Behavioural Approaches to Conservation in the Wild. Edited by Nanine R. Clemmons and Richard Buchholz. 1997. Cambridge University Press, Cambridge. 400 pp. (paperback, ISBN 0521 58054 4; hardback, ISBN 0 521 58960 6). Price: hardcover UK£ 55.00; paperback UK£ 19.95.

This book is unique in emphasising conservation of wild populations as opposed to captivity and reintroduction where behavioural research has concentrated in the past. The variety of expertise in this volume demonstrates that the complete ethological framework, not just behavioural ecology, provides valuable techniques and knowledge for conserving biodiversity. Issues addressed include: the limits and potentials of behavioural research to conservation; the importance of behavioural variation as a component of biodiversity, and the use of animal behaviour to solve conservation problems and provide specific direction for research and management practices.

Contents: Part I: Problems and issues; Part II: Conservation and the four levels of behavioural study; Part III: Examples and case studies.

Available from: Customer Services Department, Cambridge University Press, The Edinburgh Building, Cambridge CB2 1BR, UK Fax: 44-1223-325152, E-mail: directcustserve@cup.cam.ac.uk

Evolution of Social Behaviour Patterns in Primates and Man. Edited by W.G. Runciman, John Maynard Smith & R.I.M. Dunbar. 1997. 304 pp. Price: US\$ 48.00. (ISBN 0-19-726164-7).

This interdisciplinary volume includes current research on cultural and social behaviour among non-human primates, as well as work on the link between cognitive development and social organisation in the Upper Palaeolithic, and on the behaviour of modern humans.

Available from: Oxford University Press, Tel: 1-800-451-7556, Web site: <http://www.ovp.usa.org>

Last Stand: Protected Areas and the Defence of Tropical Biodiversity. Edited by Randall Kramer, Carl van Schaik and Julie Johnson. 1997. Oxford University Press, New York. Price: US\$ 42.00. (ISBN 0-195095545)

This book takes a close look at how, during the past century, tropical rain forests have been reduced to less than half of their original area and what the consequences may be for biodiversity, with an emphasis on strategies that have proven successful in stemming the loss of plant and animal species. The book argues that, although programs that combine biodiversity protection and human economic development have become increasingly important, a system of protected areas must still be the cornerstone of all conservation strategies aimed at limiting the inevitable reduction of our planet's biodiversity. The publication integrates ecological, economic and political perspectives on how best to manage tropical forest reserves and their biodiversity.

Contents: R.A. Kramer and C.P. van Schaik, Preservation paradigms and tropical rain forests; J. Terborgh and C.P. van Schaik, Minimizing species loss: The imperative of protection; K. Mackinnon, The ecological foundations of biodiversity protection; C.P. van Schaik, J. Terborgh, and B. Dugelby, The silent crisis: The state of rain forest nature preserves; K. Brandon, Policy and practical considerations in land-use strategies for biodiversity conservation; S.E. Sanderson and K.H. Redford, Biodiversity politics and the contest for ownership of the world's biota; M.L. Miranda and S. LaPalme, User rights and biodiversity conservation; R.A. Kramer and N. Sharma, Tropical forest biodiversity protection: Who pays and why?; P.J. Ferraro and R.A. Kramer, Compensation and economic incentives: Reducing pressure on protected areas; C.P. van Schaik and R.A. Kramer, Toward a new protection paradigm.

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- by alerting people to situations where primate species and populations are under threat, and
- by providing a forum for useful debate on some of the more pressing, controversial, and sensitive issues that have an impact on the conservation of these primates.

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Manuscripts (not to exceed 15 pages) should be in English or French, double-spaced, with wide margins all around. All articles must include an English abstract. If you are able to also provide a French abstract, please do so. Send three copies of the manuscript.

For authors with word-processing capabilities please send the final draft in electronic form as either an e-mail attachment (preferably in either *.rtf or *.doc format) or on a high density PC compatible diskette to ladepew@africaonline.co.ke

Use metric units only.

Tables, figures and photographs are encouraged. All require concise captions listed on a separate sheet.

Most "articles" should be accompanied by a map that shows all the place names mentioned in the text.

Figures, such as maps and sketches, should be drafted in black ink, lettered clearly to allow for reduction, and should be 'camera-ready'. Please follow the style in this issue of *African Primates*.

Black-and-white prints are best but colour slides can also be used for black-and-white reproductions. All photographs must be sharply focused and of high quality. Each photograph or slide should be labelled with a photographer credit.

'References' should be an alphabetical list of only those publications cited in the text. They should conform to the format used in this issue of *African Primates*. Give full names of all journals.

Each author should provide name, affiliation, address, telephone number, fax number and E-mail address (if available).

Have at least two senior colleagues review your draft manuscript. You should revise the manuscript accordingly prior to submission.

All articles and notes will be peer-reviewed by at least two members of the editorial team.

Please send contributions to: **Thomas M. Butynski**, Senior Editor, *African Primates*, Zoo Atlanta, Africa Biodiversity Conservation Program, P.O. Box 24434, Nairobi, Kenya, Tel: 254-2-745374 or 254-2-884369, Fax: 254-2-890615, E-mail: butynski@thorntree.com

Front cover illustration: The recently named prosimian *Pseudopotto martini*. Known from only two specimens "from the Cameroons and 'Equatorial Africa'". Drawing by Steven Nash. See notes on pages 42-45.

Logo: De Brazza's monkey *Cercopithecus neglectus*. By Steven Nash.

The views expressed in *African Primates* are those of the authors and do not necessarily reflect those of Zoo Atlanta, the National Museums of Kenya, Conservation International, IUCN/SSC, nor the Primate Specialist Group.

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