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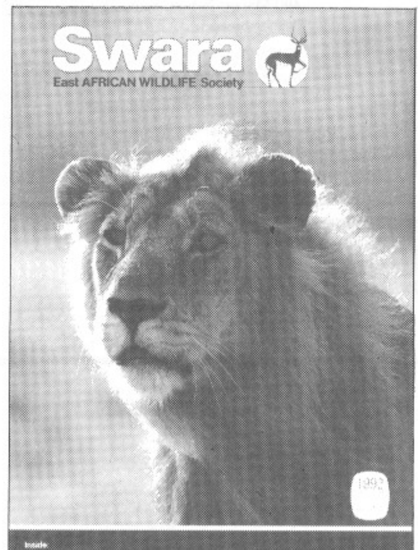

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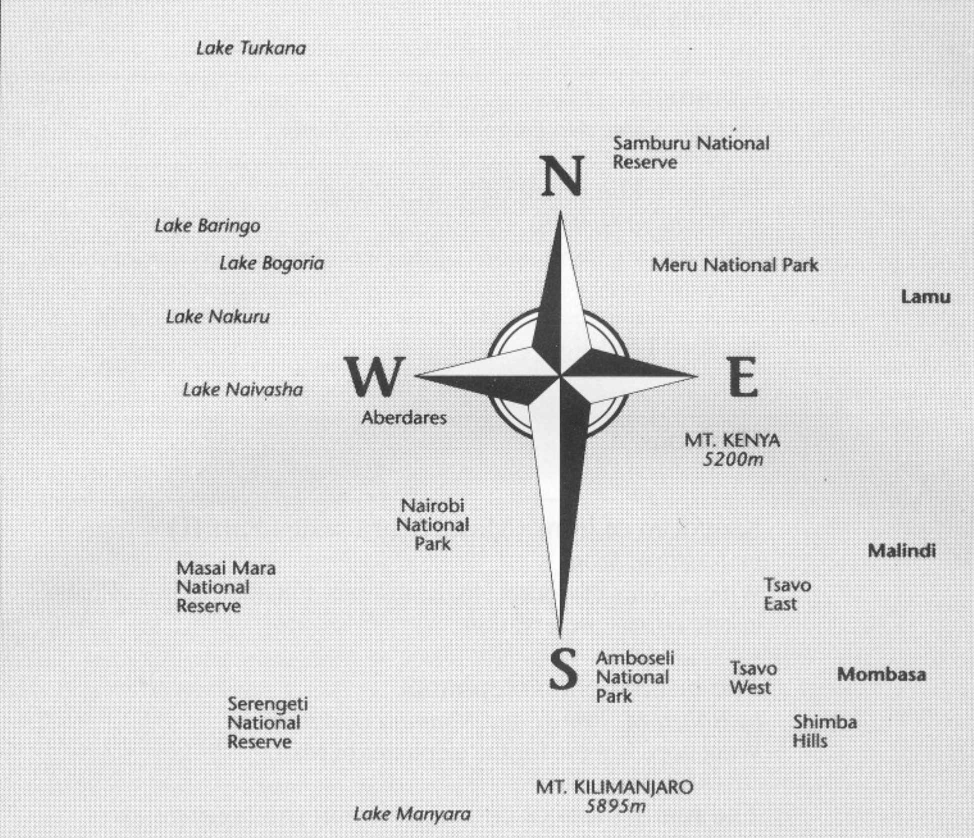

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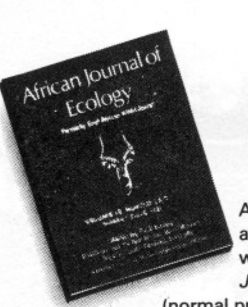

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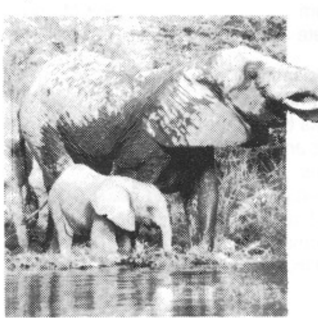

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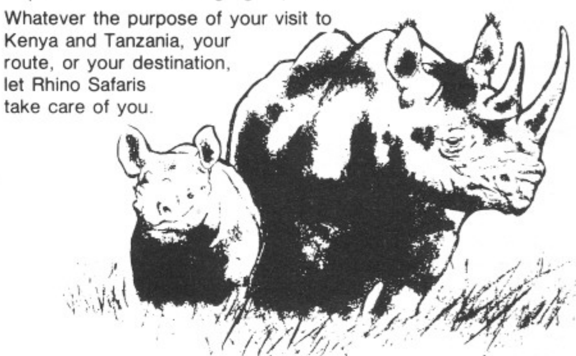

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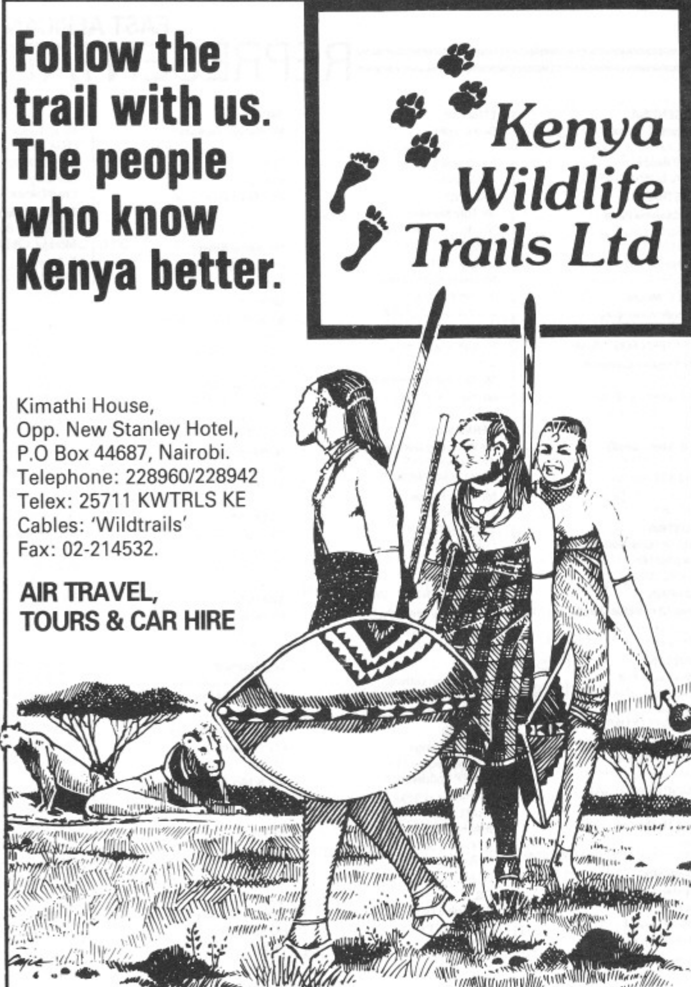

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Zimbabwe's rhinos under threat

by Lucy Vigne and Esmond Bradley Martin

The shocking reality is that there are probably only 500 to 1,000 black rhinos left in Zimbabwe.

After the black rhino populations of eastern Africa had been severely reduced through the 1970s and early 1980s, traders eager for more horn spread their attention southwards. By the mid-1980s, the rhinos in Zimbabwe and Namibia were under serious threat from poaching. Namibia retaliated by dehorning rhinos in the north-western desert regions of the country in 1989, increasing anti-poaching staff, and by stepping up its intelligence gathering network. Zimbabwe, meanwhile, began a war with the poachers, killing over 150 men. Rhinos in the Zambezi Valley were particularly under threat from Zambian poachers who would cross the border at night to kill the animals. Although Namibia's desert rhinos have remained safe since 1990, the situation in Zimbabwe is becoming desperate.

Zimbabwe's Department of National Parks and Wild Life Management believed there were 2,000 black rhinos in the country in 1991, over half the entire population in Africa. It was an extremely important last stronghold. This year, however, Parks' officials have been finding many more hornless carcasses hidden in the thick bush than they had expected. Matusadona National Park in northern Zimbabwe had an estimated population of 150, but in June 1992 only 15 could be found. The shocking reality is that there are probably only 500 to 1,000 black rhinos left in Zimbabwe.

There are three general reasons that rhino poaching has increased in Zimbabwe in the last year or so. First, the economy of Zambia has gone down further, giving a greater incentive for more poaching, while the Zambian authorities have been unable to prevent poachers from crossing the border. Second, in Zimbabwe, the anti-poaching staff have become war-weary; they now have poorer terms of service, and there is not enough equipment nor people in the field. Third, in local currencies, the value of rhino horn has gone up sharply, and the number of trade routes for the horn has increased.

The horn is smuggled into Lusaka and then mostly taken by air to Swaziland or overland to South Africa for export to Taiwan. To combat this trade, however, the Endangered Species Protection Unit was created in 1989 in South Africa, and several large consignments of horn have been recently intercepted. It seems that as a result, traders have been exploring routes up to the Yemen market, where traditionally, most East African horn was sent. Although traders in Yemen are only paying about US$1,000 a kilogramme, half the Taiwan price for horn, some middlemen may be choosing to smuggle rhino horn, originating in Zimbabwe, via Lusaka to Dar es Salaam. From there, rhino horn is known to be flown to the United Arab Emirates and Saudi Arabia. The horns are hidden in lorries and driven overland from Dubai and Sharjah, across Yemen's long unpatrolled boundary to the capital, Sanaa. This route avoids Sanaa airport where customs controls have become far tighter. In 1991, rhino horn imports almost doubled into Yemen, reaching about 450 kilogrammes or the equivalent of 150 rhinos. Although some of this horn could have come from poached animals in Tanzania, Mozambique and southern Sudan, as well as from old stocks, it is probable that Zimbabwe has become a significant supplier.

The Zimbabwe authorities, in an urgent bid to stop the poaching, have started to dehorn their rhinos, despite the many risks involved. Unlike in Namibia where a rhino without a horn is easily noticed, in dense bush poachers may only have a glimpse of the back of a rhino and may shoot without checking for a horn. Already several dehorned black rhinos have been poached. Another option would be for the Zimbabweans to form more enclosed sanctuaries. This has worked well in Kenya. At the moment, only 150 rhinos are on privately managed conservancies in Zimbabwe and most of the rhinos on state land are in the wild. Not only does a sanctuary enable a far greater concentration of guards to operate, but also it allows rhinos to be in close proximity giving them better chances to meet and mate. As their numbers dwindle in the wild, these solitary animals will become too widely dispersed and will have fewer and fewer opportunities to find one another.

What is immediately required is more international funding for Zimbabwe's rhinos. No other large mammal in the world is being so heavily slaughtered and threatened with near extinction. More money would buy much needed equipment for anti-poaching, improve the salaries and benefits of the Parks' field personnel, and increase manpower in the poaching areas which in turn would strengthen staff morale. Extra funds would also improve intelligence gathering. The Zambian connection must be investigated and eliminated. Furthermore, the governments of Tanzania, the United Arab Emirates and Saudi Arabia must make a serious effort to intercept the smugglers. Of vital importance is to increase pressure on the main markets in Taiwan and Yemen in order to end this persistant trade that has succeeded in obliterating the rhinos from much of Africa, and if allowed to continue, will destroy one of the most important populations left: those of Zimbabwe.

KRUGER: The jewel of South Africa

by Wamuyu Gatheru

Even without the 'Out of Africa' look, the Kruger is a leader in various areas of importance to conservation and tourism.

ORDER, DETAIL, discipline, perfection, quality, comfort, are words that come to mind on arrival at South Africa's Kruger National Park. This two million hectare reservation area has over the years been known for its modern and sometimes controversial wildlife management techniques. It is manned by a staff of about 5,000 members who include researchers, game rangers and veterinary personnel. Kruger National Park is situated north east of the Transvaal province and borders Mozambique to the east. Its vegetation consists of savannah and bushland which boast 137 mammal, over 500 bird and approximately 114 reptile species.

The park was formed in 1926 and named after the first governor of the Transvaal province. Two smaller parks - Sabie and Shingwedzi were consolidated to form the Kruger. The park has continued to expand to its present 19,485 square kilometres size - Kruger is actually larger than the state of Israel!

Kruger National Park was gazetted as a reaction to the wanton slaughter of the 19th century which left an empty veld once occupied by abundant game. A leading conservationist remarked that hunting trips would sometimes include up to two hundred men eating fresh game meat daily. Then, hunting was part and parcel of the White South African's lifestyle. Though game hunting continues to date, conservation of game is appreciated by most South Africans. From 1961 to 1989 all large and smaller game species that had occurred in the Kruger in earlier times were successfully relocated there. These included both white and black rhino, grey rhebuck, red duiker, Lichtenstein hartebeest and samango monkey.

When the park was initially formed the approach of the National Parks Board of South Africa (NPBSA) was to conserve individual plant and animal populations. However, today the NPBSA seeks to conserve habitats. This is because biological diversity relies on interaction and no single species can be conserved in isolation.

This approach explains the wildlife management techniques of the Kruger. Large herbivores which include the elephant, Cape buffalo and hippo are culled annually. The parks management team has estimated the park's current carrying capacity of elephant, hippo and buffalo to be 7,500, 3,000 and 2,500 respectively. Any in excess are removed by culling to prevent the destruction of the habitat on which these and many other specimens depend. It is obvious to any visitor from the condition of the animals and vegetation that the culling programme is a success. Kruger, like the rest of the country, is experiencing an extended harsh drought. It has been very bad for six months now and game mortality is still not noticeable to the visitor. However, Marco Coetzee a senior environmental education officer and elephant specialist predicts heavy mortalities soon. 'We expect a grim situation in less than six weeks time if it doesn't rain. Culling is the least we can do'.

Skukuza - the capital of Kruger and one of the fifteen rest camps is the hub of all research and management activities. Here a research team which include entomologists, botanists, soil scientists, predator and herbivore experts are housed at the modern Nature Conservation Centre. All management procedures are a result of long hours of careful research. This team determines the annual culling quota. Data collected from aerial surveys is crucial to the culling programme. Two surveys are conducted every year. Besides keeping track of numbers, herd structures and vegetation condition are also documented and the information computed.

All parts of the carcass are utilized in the By-Products Plant which is a very modern outfit. Facilities in it include an abbatoir, cold rooms, canning, processing plant and drying rooms for dried meat otherwise known as *biltong*. The facilities are collosal to accommodate carcasses as large as elephants'. Kruger National Park has since the banning of the ivory trade accumulated the equivalent of Kenya Shillings (Ksh) 100 million worth of ivory. According to park officials this has greatly reduced income to run the park. The Kruger is financially independent and in fact supports some of the smaller parks in the country.

Tenders are invited from other parks and zoos both in South Africa and elsewhere for the purchase of juvenile elephants. On an elephant cull, only adults and sub-adults are culled as these would be physically impossible to translocate. The juveniles' conditions are monitored for a couple of weeks in bomas before translocation to ensure successful translocation. The Kruger management is 100 per cent successful in its translocation - no mortalities are experienced. The translocation procedures have been refined over the years and are therefore very dependable. A visit to the elephant bomas does remind one of a zoo but the healthy, playful juveniles and the assurance that all will be in their respective 'homes' in less than a month's time does make one feel a little better.

The park receives 700,000 visitors every

Opposite page. Top right: Lion. Predators are considered a threat to rare species.
Centre: Common waterbucks. Their numbers are kept in check by culling.
Bottom left: Greater kudu, like others, is threatened by drought.
Bottom right: White rhino has been successfully relocated.

Duncan Butchart

Duncan Butchart

Duncan Butchart

Elephant at waterhole. Typical savannah vegetation in the background.

year, 88 per cent of whom are South Africans. Accommodation which ranges from campsites to luxury guest houses costs between Ksh 200 and Ksh 1800 a night. When I asked Chris Marais, the Manager of Visitor Services why they had no lodges in the park he answered in a very decided manner. 'We want the South African to enjoy the Kruger. With the political changes in South Africa we have received a lot of pressure from multinational hotel companies to build lodges here. This is a wilderness conservation area, not a recreation facility. Wildlife comes first.' The visitor to Kruger goes to bed early and gets up for sunrise game drives. There are basically no recreation facilities, no film theatres or discotheques, no bars either. Guests wine only while they dine. On some nights the environment education service shows films on conservation.

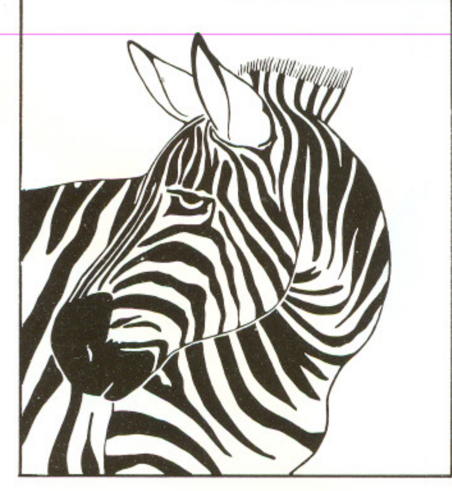
Apartheid laws in the past made it impossible for Black people, South African or otherwise, to visit the Kruger because facilities were reserved for Whites only. A smaller reserve, Manyeleti to the west of Kruger, was open to Black people. A Black employee did not hesitate to let me know how 'privileged' I was to be dining at the Skukuza's Selati restaurant.

A Black visitor in the Kruger attracts a lot of attention from both staff and tourists. A few Black families are taking advantage of the 'new' South Africa and spending weekends enjoying this two million hectare reservation area which was inaccessible in the past. However, entrance and accommodation fees are still out of reach for the average black South African. The park has only very recently begun to employ Black people in other positions besides subordinate ones and even then, grudgingly.

Kruger is surrounded by highly populated Black settlements. Though the park is separated from these masses by an electric fence, this could potentially be a threat to this large and exclusive park. Koos van der Merwe, a senior education officer feels the Kruger's position is not threatened in any way. 'The park is a monument of the country in itself; a living monument – politicians will want to preserve it.' Politics of South Africa are in a near explosive state and rather shaky ground for the future of any institution let alone a national park. Koss, however, assured me that the park is economically viable to the local community. 'Tar roads and power lines are present in these areas because of the Kruger. The curio industry and other related industries are made possible by the park. The park has also started a herbal and indigenous tree nursery for the local people. It is also investigating medicinal uses of these plants.' However, for a park Kruger's size and national status a lot more could be done.

Most of the contact with local South Africans is made by the Environmental Education Services. Gert Erasmus, the Manager of these services, feels there is great urgency to pass on the conservation ethic to all. 'The air, the waters, top soil ... has got less than five years before irrepairable damage is done worldwide'. With five education officers, Gert conducts environmental courses both in the Gold Fields Environmental Unit and outdoors in bush camps. With films produced by the Skukuza Film Processing Unit, Gert and his team educates ordinary visitors and school groups in the park. Policy makers, developers and the media are also invited to week-long conservation courses. The education department seeks to develop an environmental ethic and they are doing a good job.

Contrary to what most people believe, only 3.2 per cent of Kruger National Park is developed. One does get the feeling of being on a highway and not a park with all the tarmac and road signs, but even without the 'Out of Africa' look, Kruger leads in park management, tourist comfort and urgently needed environmental education ... making it a rare and priceless jewel.



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Werikhe walk funds help rhinos – and people – in Kenya, Cameroun and Namibia

Tom Hanseon

Michael leads the 1992 Save the Rhino Walk of the Zoological Society of San Diego, California.

Endangered black rhinoceros all over Africa have better prospects for survival, thanks to money raised by Michael Werikhe, Kenya's own Rhino Man, in the United States.

According to Helen Gichohi, chairperson of the Michael Werikhe Walk Committee, efforts to save the black rhino in its natural habitat has also created new jobs and tourist potential in Africa. She said that the East African Wild Life Society and Wildlife Conservation International have already disbursed funds raised by Werikhe to four projects:

In Kenya, a wall along a boundary of Ol Ari Nyiro Ranch in Laikipia will serve a dual purpose: it will keep rhinos inside the ranch, where they are protected. It will also stop wild animals from wandering out and damaging crops on nearby farmland. The building of the wall, soon to begin, will provide jobs for many people in the neighbourhood.

One million shillings were given to the Gallmann Memorial Foundation, which operates the ranch as a wildlife sanctuary, to purchase a tractor and tipper-trailer to build the wall, and pay salaries to start the work.

Kenya's programme of rhino sanctuaries has worked well, but small populations of black rhinoceros remain outside the parks. To help the Kenya Wildlife Service monitor these rhinos, and translocate them if they are threatened, Ksh 800,000 has been allocated to purchase a four-wheel drive vehicle and build holding pens for translocated animals.

The last of the West African race of the black rhinoceros are found in Cameroun. Only about 30 to 40 rhinos remain. A project was launched to save the rhino in Cameroun early this year. Based on Kenya's success, it will involve moving some animals to a protected rhino sanctuary, and community work to encourage the protection of the other rhinos.

About Ksh 200,000 was given to the World Wide Fund for Nature in Cameroun, which is co-ordinating the project. This was spent on a quick aerial survey and on holding a workshop on rhino conservation attended by government officials, wildlife biologists and policy makers.

The desert race of the black rhinoceros still survives in Namibia, Africa's newest independent nation. Because of the vast distances involved in this arid country, a mobile patrol is needed to survey and protect the desert rhino.

About one million shillings was given to the Save the Rhino Trust Fund of Namibia to equip the 'Werikhe Rhino Patrol'. This includes a four-wheel-drive vehicle, radio, binoculars and uniforms. Michael Werikhe was invited to launch the patrol, to boost the morale of those who risk their lives to protect the rhino.

Mrs Gichohi added that Michael Werikhe's six-month fund-raising walk across the United States in 1991 is still bringing dividends.

'Werikhe was honoured by the Eddie Bauer Company of the US as one of its 1991 "Heroes for the Earth",' she said. 'This year, he gave the keynote speech to a major gathering of environmental attorneys in Eugene, Oregon, USA. And he went back to the United States to lead the 1992 Save the Rhino Walk of the Zoological Society of San Diego in California.'

'Werikhe brought back a cheque for US$10,000 from the 1992 Save the Rhino Walk in San Diego. This will be used to continue assistance to Cameroun, and to support other rhino conservation projects in Kenya and Tanzania.'

Highlights on the Eastern Africa Environmental Network Conference 1992

The Second International Conference of the Eastern Africa Environmental Network (EAEN) was held at the National Museums of Kenya, Nairobi on 8 May 1992. It was sponsored by the New England Environmental Network (NEEN), the East African Wild Life Society (EAWLS), Global Action Network (GAN) and the National Museums of Kenya (NMK). More than 280 participants attended the conference with representatives from Botswana, Canada Burundi, Ethiopia, Kenya, Italy, South Africa, Sudan, Tanzania, Uganda and USA.

The conference was formally opened by Mr Z. M. Anyieni, Chairman of the Perma-

nent Presidential Commission on Soil Conservation and Afforestation. He referred to the international perspective of environmental problems and pointed out the need for a country like Kenya to make some crucial decisions in view of the prevailing conditions. He emphasized the cardinal role of proper planning in development projects. He urged Kenyans and political leaders to pay heed to conservation of environment and natural resources.

Miss Belinda Rego, chairperson of EAEN Executive Committee, while welcoming the participants, briefed them on the background, aims, objectives and the achievements of EAEN.

Dr Njoka Theuri, chairman of Scientific and Technical Committee of EAWLS outlined the responsibilities of EAWLS which covered EAEN. He commended EAEN for the achievements it has so far made since its inception. He said that EAWLS wanted to see NGOs go beyond the level of pressure groups and the EAWLS was proud of EAEN programmes.

He advised the participants to reflect on the 1991 conference recommendations and to assess the post-conference actions taken so far.

Conservation Fund

During the last two months, the East African Wild Life Society has received donations of over Ksh 460,000 to its Conservation Fund. We are extremely grateful to everyone and in particular to S. Allen, P. R. Bannister, Mrs C. Bard, Mr J. J. Cederholm, Aja Douglas, Mrs E. A. Keegan, Mrs L. Lapi, Mr E. R. Lubin, S. Mardigian, Roth Markus, C. McLean, S. Potter, Marion J. Roche, Jean Schulz, T. Serapini, Dr. R. Strehler, John and Rosemary Sutton, P. H. and P. D. Treasure, Dr. A. Visiola, Gerd Vohringer, Grant and Barbara Winter for their generous donations of Ksh 1,000 and over. At the request of some of the donors, certain of these donations will be channelled to specific projects.

Save the Rhino Fund

Donations worth nearly Ksh 12,000 have come into the Save the Rhino Fund over the past two months. The Society would like to thank all donors for their generosity and in particular Lorna P.D.L. Hayes (Mombasa Hotels) and James A. Davidson, who gave over Ksh 1,000.

The African Ele-Fund

The Society has received over Ksh 7,000 in support of this fund during the last two months. We would like to thank all donors, but in particular James A. Davidson, Dr. Adrian McCracken and Miss M. S. Haywood for their handsome donations.

The Behaviour guide to African Mammals, by Richard, D. Estes, University of California Press.

We have received many inquiries as to where the above book can be purchased since we reviewed it in *Swara* March / April 1992. As far as we know the book is not locally available but those interested can obtain it from:

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The birth of an elephant

On the evening of Friday 7 February 1992, I was privileged enough to witness the birth of a baby elephant in the undeveloped area on the north eastern side of the Masai Mara Game Reserve, Kenya.

My clients and I had just completed a 200 miles cross country horseback safari across Masailand and had decided to rest the horses and go out by Land Cruiser to enjoy some close up photography of the game. Of course, there is always an abundance of wildlife in the Mara and particularly in those periphery areas that border the reserve.

As dusk approached we headed back to camp driving through acacia scrubland in the catchment area of the Olare Orok *lugga*. We encountered a small herd of elephants, all cows with calves. They were quietly browsing in the acacia and out towards the more open ground. We noticed an older cow with a bigger calf trailing behind a little. She stopped browsing and stood quite motionless for a while and her calf (estimated between 3 and 4 years of age) moved on. The cow then suddenly knelt down with both front and back legs in the worshipping position for a moment. After she stood up she defecated some rather slimy droppings which she inspected carefully. Then she lowered herself onto the hard ground lying on her side with trunk outstretched for several minutes. She then got up and appeared to be quite uncomfortable and I suspected abdominal pain but nothing more than upset bowel. Her breasts were not swollen and I had no inkling of what was about to unfold.

Frants Hartmann. F.R.P.S.

'This is how it is done.'

In her state of discomfort she began to walk backwards in rather a clumsy manner knocking into bushes, stopping, swaying slightly and then started the reversing procedure all over again. I was greatly concerned. We then observed her vagina was rather extended hanging down between her hind legs. At this point we concluded she may be in labour. For a full half hour between 6.30 pm and 7 pm she continued her performance of kneeling, lying down, standing motionless or reversing into the small acacia trees in the little depression. Visibility was quite good and we were no more than about 50–75 yards from her. She did not appear to be disturbed by our presence. No other elephants were in the vicinity. She was alone except for our two vehicles.

Then a little after 7 pm, with heavy breathing and in the squatting position she appeared to give an enormous heave. We could see the moist opening of her vagina dripping fluid. She stopped pressing her rear end against the trees and again gave another heave in the squatting position with her head bent down.

I moved my car little closer to get an uninterrupted view. Staring in wonder through my binoculars, I was totally captivated with the unfolding drama, as were the others. I saw her give another push and the amniotic sac appeared. The baby was half way out. After an interval of about a minute, with heavy breathing and another push, the baby dropped out with a 'splash'. The mother whipped round and vigorously slapped her baby enveloped in the sac. Soon the baby was free and struggling to find its legs. The mother nimbly stepped around her calf continuing to wipe away the afterbirth. There was nothing overly gentle about this aspect of the birth. As soon as the baby was clean the mother started to scuff the earth vigorously around the calf, never stopping for a moment. The dry earth was being kicked up onto the baby's body to help dry off the little moist creature. By now I had the headlights on as it was about 7.15 pm. The mother appeared to be unconcerned and had totally accepted our presence.

As the baby wobbled about, often tipping forward on to its little stumpy trunk and then overbalancing backwards on to its protruding tail, the mother kept up this scraping and scuffing with her front legs, perhaps providing a firm base on which the baby was to make its first steps. Occasionally she would rip off some light branches from the acacia and place this brush around the 'nursery'. Then she would curl her trunk around her calf and affectionately steady the little fellow so eager to get moving. Its little bright opal eyes reflected in the headlights.

Then at about 7.45 pm the cow left her calf for the first time and walked a few paces over to the afterbirth, collected it in her trunk and walked back to where the soil had been loosened and buried it.

By now the calf was actually standing up albeit with all four legs wide apart and swaying in the most precarious manner. Mother thought it was time now to give her baby its first walking lessons. She angled up parallel with her baby and said in elephant language 'This is how it's done. Follow me'. She strode forwards about six paces and looked back. There was her baby with a foreleg stuck in the air not knowing where to put it next. Mother then reversed and took up her position again next to her calf. This went on time and time again until finally after much overbalancing and muffled laughter from us spectators, the baby got the gist and took its first few steps along the path mother had cleared of grass.

It was a priceless sight to see this little fellow swerve off course in the most spastic fashion attempting to follow Mama. But it was mobile. It was a little after 8 pm by now. We heard a lion roar quite close but this did not seem to bother mother and child. The rest of the elephant herd remained some distance away in the dark and never visited the birth place during this event.

At about 8.30 pm we drove back to camp almost in silence, overawed by this thrilling experience seldom witnessed by man. Normally, the act of mating and birth are done in the dead of night hidden from the curious eyes of man. This will be amongst the most cherished memories in all my many years in the bush.

A H V Church

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THE GREEN of the rain soaked Mara plains stuns the senses. It is as if the whole world were alive with animals. Gazelles in their tens of thousands speckle the earth; parties of warthogs with piglets nuzzle the fresh shoots on bended knees.

The richness of the scene dazzles the eye, the piercing sun tempered by the breeze. Three hundred buffalo, massive bovine shapes, plough a dark furrow through the rolling sweep of the landscape, trampling the delicate white blossoms scattered like confetti across the plains. A hyena watches from the shadows, dark eyes fixed on a calf with a broken leg struggling to keep up with the herd.

As I jot down my thoughts, I realise that nothing has changed. The scene I am describing is little different from others I have witnessed during the fifteen years I have lived in the Mara. The endless cycle of life and death is everywhere repeated. There is a sense of times past, of animals existing as they did long before man appeared on the savannahs of Africa.

I park my vehicle beneath a shady tree just beyond the reserve boundary, and walk through the narrow entrance of one of the Maasai's temporary thorn bush enclosures, long since deserted. Three makeshift shelters snuggle against the circle of thorns, each one an igloo of branches thatched with grass and cow dung, supported by a single main timber set astride forked centre posts. The branches are secured with strips of bark, twisted into knots to hold the structure firmly in place. Everything is crafted from nature. The ash of countless fires stand in a windswept pile in front of the simple shelter where the *morani* kept watch for predators and cattle-rustlers. A day or so earlier I had watched as a cheetah and her yearling cubs explored the abandoned dwellings. Effortlessly the three cats leapt on to one of the low roofs, where they lay together, taking in the view of the surrounding countryside and searching for prey. Now a crombec is busy nesting beneath the arch of one of the shelters; its tiny nest is as carefully woven as the roof it hangs from. The broad leaves of a sodom apple plant erupt from the floor, where a frog sits so perfectly camouflaged among the cracked and weathered dung that I almost tread on it.

This is man at his least destructive, catering to simple needs, without extravagance, shorn of the wastefulness that is such a corrosive feature of Western society. Once abandoned, bomas such as these gradually blend with earth and wind. The long grass reaches up and joins hands with the thorn bush; the cow dung floor enriches the soil. In a year or so the boma will have been transformed into a dense patch of croton bush, seeded by the Maasai cattle, providing shelter for lions and leopards, as well as food for elephants and rhino.

But time is crowding in on the Maasai's spotted land. The conical roofed huts and corrugated iron houses near to Mara River Camp have the look of a pastoral tribe adapting to a more sedentary existence; strips of plastic and empty containers dot the plains. As the population becomes more sedentary beyond the conservation area there are signs of overgrazing and erosion.

In recent years tens of thousands of acres of the Loita plains to the east of the reserve have been leased by the Maasai to farmers to grow wheat. The wheat ranches squeeze more people, cattle and wild animals into the ever-shrinking wilderness. Denied access to large tracts of their ancestral wet season pastures and favoured calving grounds, the Loita's wildebeest population has dwindled during the last ten years from 90,000 wildebeest to around 30,000. Some of the animals now stay in the Mara year round, avoiding the wire fences further to the east.

Traditionally, the Maasai have always been tolerant of wild animals, relying on their cattle to nourish them, and a nomadic lifestyle to sustain their traditional culture. But more recently the pastoralists have been forced to compete with huge populations of wild herbivores. For four months each year huge herds of wildebeest seep like a black stain across the green of the plains, swarming over the lush pastures and devouring the precious grass. The Maasai naturally resent the burden of all these animals and question why their cattle should be forbidden from sharing the grass and water denied to them within the reserve boundary. And predators wandering outside the reserve increasingly pose a threat to man and his livestock.

The wildlife dispersal area bordering the reserve is trust land administered by the Narok County Council. This land is divided into group ranches which are potentially some of Africa's finest communally owned game ranches. Until recently the Maasai who actually live in the group ranches benefited little from the revenue generated by their land. In an effort to compensate for this, and to create financial incentives for maintaining the ranchlands for non-agricultural purposes, it was agreed in 1989 that they would receive twenty-five per cent of the daily fee collected from visitors to the Mara - a sum of US$ 2 per visitor. In return for this revenue they must continue to abide by a comprehensive land use policy, which excludes sub-division or cultivation. Later this year entrance fees will be increased to US$ 25 per person, 5 of which will go to the Maasai. It is the intention of the County Council to try and extend the areas available to wildlife and to introduce reserve bye-laws to further protect the wildlife on group ranches.

But within the next four or five years land adjudication in the area will have been completed, establishing individual ownership within the group ranchlands. And the trickle of emigrants from the more densely populated areas to the north and west is gathering pace. Will the last of the nomadic pastoralists eventually fence off individual

Opposite page; Top left: Saddle-billed stork.

Top right: Maasai youth with spear.

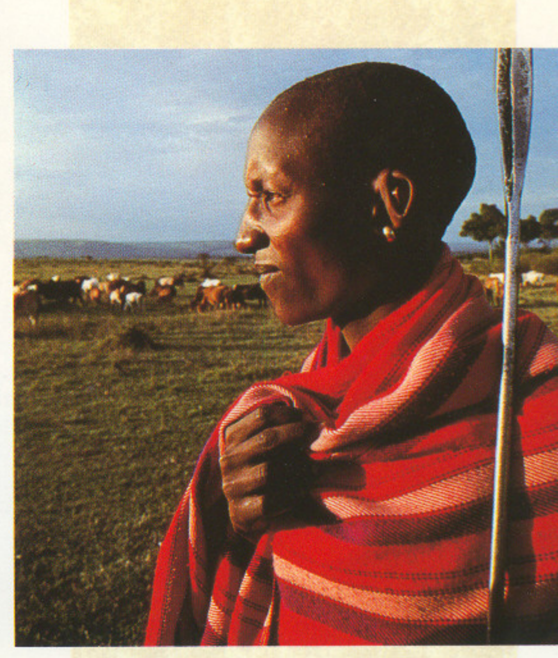
Centre left: Two warthogs fighting.

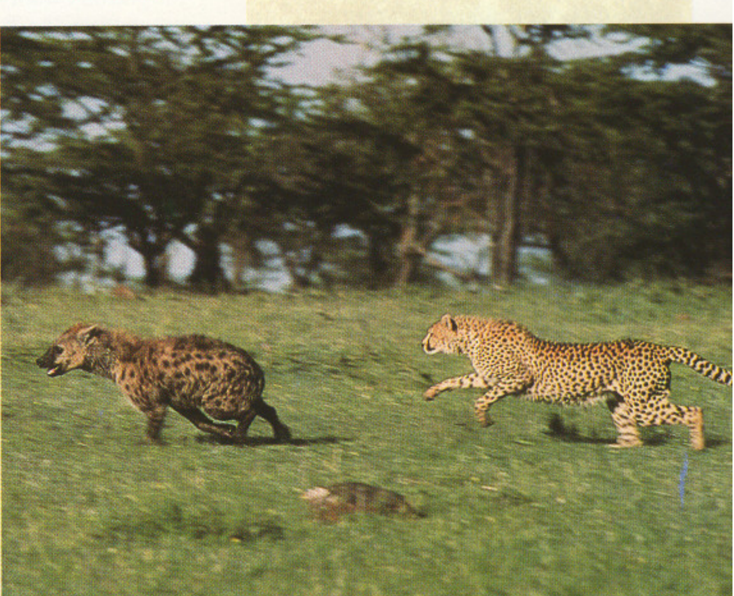
Centre right: Cheetah chasing hyena.

Middle: Gloriosa superba.

Bottom left: Leopard with kill (young impala).

Bottom right: Zebra leaving hippo trail.





Above: Elephants at sunrise.

Top: (far right): Dark clouds; long rains – beginning March ending June.

Centre right: Cheetah with cubs.

Bottom left: Lion cub.

Bottom right: Lioness chasing a zebra.

Opposite page: Wildebeest crossing the Mara River. There are 1.6 million wildebeest and – together with 250,000 zebra – make up the largest and most spectacular land migration on earth.

Opposite, inset: Hazards of migration.

plots to try and ensure that no one else moves on to their land?

At present, the Maasai herdsmen are more righteously concerned with their livelihood than with understanding what motivates a lion or elephant. The wildlife sanctuary that provides tangible material profit is going to be the one that survives. Hunger and disease are the norm for many people in Africa. Only by removing poverty can wilderness be protected. For as long as the Maasai see a financial return for the hundreds of thousands of visitors who drive daily across their land, there is still hope that the area surrounding the Mara can continue to support pastoralism and wild animal populations.

Ultimately the survival of the Mara depends on the goodwill of the local people - coercion won't work. To help achieve this a community-based conservation education extension programme has been initiated by Friends of Conservation with the support of the Narok County Council and aided with a grant from the British Overseas Development Agency. The object is to involve the local community in the conservation of wildlife and other natural resources, while helping them to support their pastoral lifestyle and meet their development needs. A number of women's groups have already been formed to produce beadwork locally to supply the curio shops at camps and lodges. At present much of the beadwork is brought in from other parts of the country.

Wildlife-based tourism is Kenya's primary source of foreign exchange, producing US$ 480 million in 1990 – 43 per cent of the country's total earnings. The Mara alone generates approximately 1.5 million dollars for the Narok County Council. But the impact of tourism needs to be carefully monitored.

For many years people have expressed concern about the number of vehicles operating in the most highly congested regions of the Mara. The ugly tracks they initiate are all too apparent, particularly during the rainy season when driving conditions can be extremely difficult. A game viewing plan, based on the construction and

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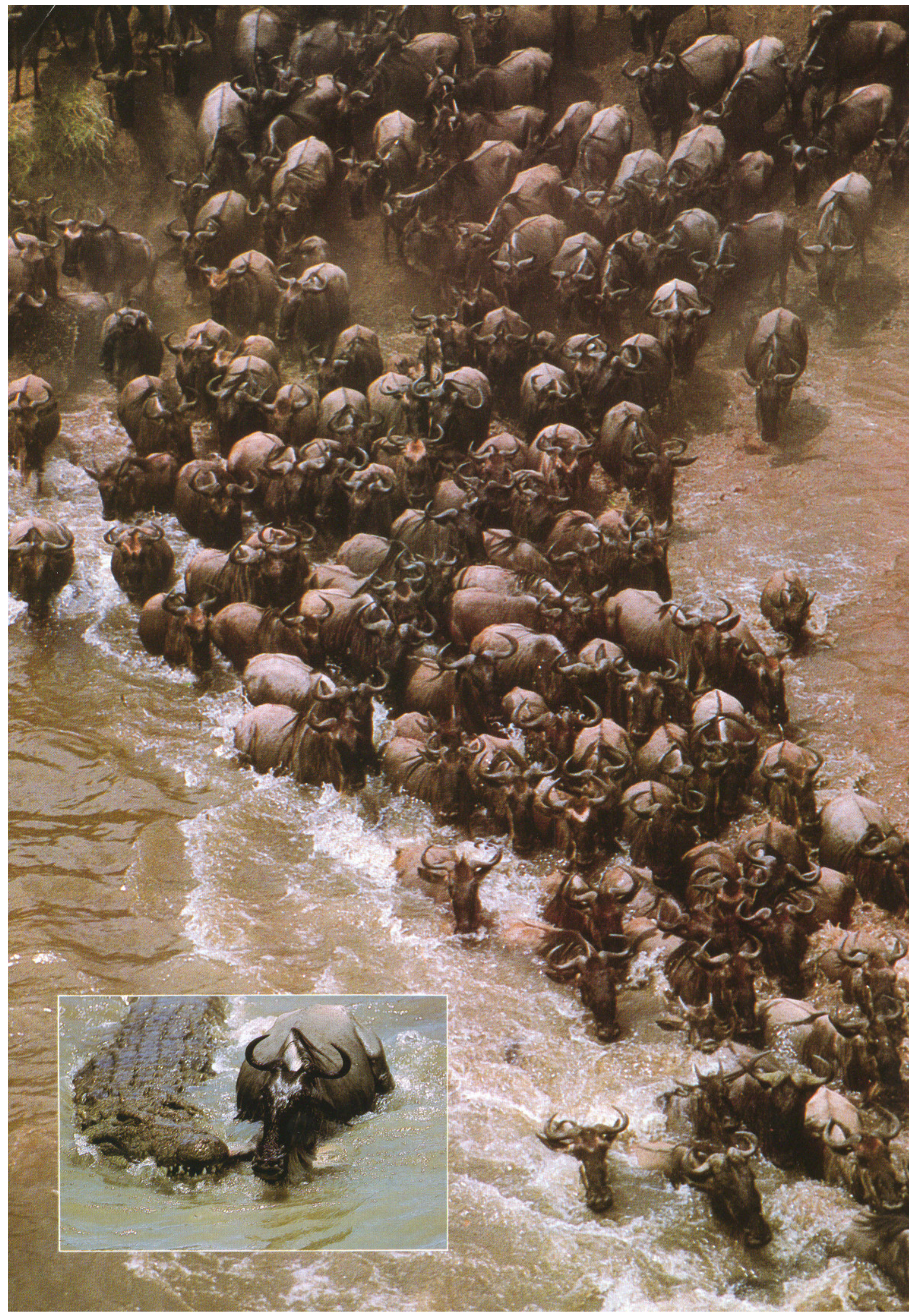

Leopard in a favourite hiding place.
Right: Chui and her two male cubs.

Maasai women at ceremony.

Jonathan Scott in his vehicle in the field.

maintenance of a comprehensive network of all weather roads, has already been outlined. If this is implemented it may be possible to control off the road driving; all other parks and reserves in Kenya prohibit people from driving off the tracks. Another approach was experimented with in 1987 when the Senior Warden took the bold decision to close some of the most heavily used areas for the duration of the long rains. No one was allowed to drive in the vicinity of Musiara Marsh, along Rhino Ridge or in an area near Keekorok, allowing them a welcome respite.

To try and cope with the large numbers of tour vehicles roaming the reserve, ranger patrols monitor some of the more popular game viewing areas to try and prevent people harassing animals such as cheetahs who need to secure their prey during daytime, while lions and hyenas – their major competitors – are lying up.

The increase in non-Maasai people living around the periphery of the reserve has inevitably led to an upsurge in meat poaching. In response to this threat the Stock Theft Unit mounted a successful anti-poaching campaign along the Siria escarpment, leading to a decline in the number of animals trapped in wire snares. And a major training programme was completed during September 1991 by all reserve rangers. Currently the level of off-take by the poaching gangs is sustainable, due to the large populations of wandering herbivores that migrate beyond the reserve boundary.

Fortunately, poaching of rhinos and elephants is virtually non-existent in the Mara. The vigilance of the reserve authorities and the presence of large numbers of tour vehicles makes it difficult for poachers to operate undetected. In fact the Mara is one of the best places in Kenya to view elephants. Currently there are 1,500 elephant living in and around the reserve, some of which sought refuge in the Mara during the 1980's to avoid heavy poaching in the northern Serengeti. And the rhino population is one of the most closely monitored in Africa, with six new calves due to be born this year (1992). The population has increased from an all time low of eleven rhinos in 1982 to the present figure of thirty one (27 per cent of which are calves).

Sustainable utilisation has become the byword for many environmentalists. In southern Africa a blend of tourism, trophy-hunting, and game ranching for meat and wildlife curios helps to fund conservation and provide revenue for people living in wildlife areas. A similar approach could be adopted in Kenya, and if properly controlled might prove successful. But a purely materialistic approach is not enough to save wilderness. Profits from tourist based wildlife conservation can always dry up, as the Gulf War and more recent events in Kenya have so clearly proved.

There is nothing new about exploiting natural resources for economic gain. Forty years ago Aldo Leopold, the American conservationist pointed out its limitations: 'A system of conservation based solely on economic self-interest is hopefully lopsided. It tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but that are (as far as we know) essential to its healthy functioning'.

Surely idealism also has a part to play in conservation. As HRH The Duke of Edinburgh, President of WWF International,

said: 'The need for someone to stand up and champion nature, and speak for the Earth with wisdom and insight, is urgent.'

I decide to take one last game drive through the northern Mara before heading for Nairobi. Firstly I track down the Bila Shaka lionesses (some of whom I have known for more than ten years), and find them slumbering in the shade of the Miti Mbili *lugga* to the east of Governor's Camp. Within the next few months their nine offspring will become semi-independent, old enough to prompt their mothers to come into season again. The four sub-adult males will soon be ousted from the pride. But what about their five sisters? Will they be recruited into the Bila Shaka pride. Or - just like ten years earlier when the whole area was lorded over by the Marsh lions - will the pride territory be divided among female relatives?

So much has happened from the perspective of the individual animals - or so it seems. But the truth is, despite the many hours of detailed observations, we still know little about predators. Deductions made from even the most scientific of studies represent good guesses, acknowledging how incomplete is our sense of worlds outside our own. Generalisations mask the uniqueness of the individual, clouding our perceptions; we cease to let them be themselves - to be - imprisoning them by our superficial descriptions. Biologists working with the twenty-five-year-old Serengeti lion project have given us a new lion, one separated from folklore. But they have not found the whole truth; the animals' inner lives remain a mystery. As Barry Holstun Lopez wrote in *Of Wolves And Men*: 'I remember ... recalling Joseph Campbell, who wrote in the conclusion to *Primitive Mythology* that men do not discover their gods, they create them. So do they also, I thought ... create their animals.'

I head north, indulging the urge to drive through Leopard Gorge, hoping that I might find some sign of the female leopard known as the Paradise female. I stop to scour the limbs of an ancient ebony tree. I had once found another female leopard known as Chui resting along the tree's bare arms, the fresh carcass of a young impala dangling by her side. The tree had been one of her favourite resting places. There she was safe from the lions and hyenas, hidden from the tsetse flies. Now the tree lay sprawled on its side, its enormous sculpted form resplendent in a thick coat of silvery bark. When it crashed to the ground, it had torn free from the brown earth, uprooting giant slabs of red rock, creating a perfect daytime hide-away for puff adders and porcupines. A few metres above, a harrier hawk scuttled over the gnarled grey limbs, ignoring the spotted hyena resting in the shadow of the up-ended trunk. Prodding and probing, flapping and floundering, the hawk thrashed its long wings to keep its balance as it searched for food. Giant wood-boring beetles and striped skinks wedged themselves even tighter into the old tree's cracks and crannies, trying to avoid the hawk's long, scaly legs and outstretched talons.

In the distance I could see a tractor grinding through the thickets, scouring the land for firewood. With each passing day the staff from the tented camps were forced to travel further and further afield, searching for wood-fuel to service the kitchens and heat the boilers that provided hot showers for visitors. Increasingly, the land is robbed of minerals needed to help replenish the soil, the hyenas and porcupine forced to move again. Soon the firewood will be finished, unless - as is intended - the camps are required to use less wood-intensive heating systems or convert to solar heating.

The Mara is still one of the world's most spectacular wildlife habitats. If I had only one day in Africa, this is where I would choose to spend it.

I drive on, travelling the familiar rocky path that leads towards Leopard Gorge. Even if it were not prime leopard habitat, the gorge would always be worthy of a visit because of the sheer beauty and mystery of the place. I have explored its caves, felt the chill, cool air that attracts the daytime leopard, smelt the heavy ammoniac reek of the hyrax droppings piled centimetres deep on the floor. At times I come here just as the light is fading from the sky and sit and listen to the night sounds echoing between its rocky walls. It is an eerie spot: a haven for hyrax and eagle owls, agama lizards and Gabon nightjars, the chack-chack of a European wheatear mingling with the raucous chatter of a party of Ruppell's long-tailed starlings.

I never fail to look up at hiding places that would appeal to any leopard, more in hope than the belief that I might find what I am looking for. There are times when I know that all the searching will be in vain. The bush hyrax are relaxed and huddled together, enjoying the early morning sun; baboons scream and squabble over some social transgression as they plunder the fresh crop of figs and ripening fruits from the African greenhearts. Under these circumstances, any leopard in the vicinity would already have crept into the safety of one of the caves or moved on.

Tsetse flies bite deeply into my skin as I try to concentrate my vision through binoculars, scanning the rocky crevices and caves, where I have spied leopards in the past. A pair of red rumped swallows flit back and forth, cementing their mud houses beneath overhanging rocks. Here the passing years seem but a blink in time: the swallows are building in almost exactly the same position as five years earlier. Patches of vegetation lie flattened by the passing of a variety of animals - topi and impala, buffalo and zebra - who from time to time make their way cautiously through gaps in the rocky ridge, to feast on the lush vegetation.

This time I am in luck. The cluster of vehicles gethered in the bottom of the gorge pinpoints the place where the Paradise leopard has chosen to rest. She lies there in the leafy crown of a fig tree, her head turned away, ignoring the outbursts of laughter, the chatter of drivers. Finally, when she leaves her aerial perch and slips away, everyone falls silent. She creeps along the rocky horizon, pausing only to stare towards the place where two lionesses lounge on their sides, each with a litter of young cubs clinging to their teats, the cubs' bellies swollen with milk. The leopard knows they are there, and is gone. The search for answers, which gives meaning and tension to the watching, is what draws me back again and again to this place. The Mara is still one of the world's most spectacular wildlife habitats. If I had only one day in Africa, this is where I would choose to spend it.

The transition from wilderness gathers pace as I negotiate a way through the rutted track passing Euphorbia Hill, the haunting cries of Aitong's wild dogs just a memory. Facts and figures pass before my eyes - the grim reality of our future imposed on the beauty of nature. Tourism will be the world's biggest industry by the year 2000 - but at what cost the environment? The human population will double in fifty years to ten billion - Africa's population of 630 million will soar to one billion by 2000. By then one million kinds of animals and plants will be extinct. Yet biological diversity is the key to the earth's ecosystem, helping to regulate the climate and generate soils, providing food and medicines as yet unknown to man.

A sign alongside one of the Maasai bomas announces the Ololturoto cultural manyatta. The high clear notes of women singing greets a party of visitors as they enter the manyatta. Nearby fifteen schoolboys hurry through acacia thickets that at times provide shade for buffaloes and lions. The boys are clad in blue shirts and red shorts, school books tucked inside cowhide satchels slung over their shoulders. Some wear traditional red *shukas* over their school uniforms, the wind revealing the changes. In years to come they will no doubt be proud that their land harbours one of Africa's greatest wildlife sanctuaries. And they will be able still to enjoy the sight of wild lions - hear their roars echoing across the spotted landscape as they recall the part these magnificent creatures have played in moulding their colourful traditions in the Kingdom of Lions.

Anyone interested in supporting conservation in the Masai Mara is welcome to contact:

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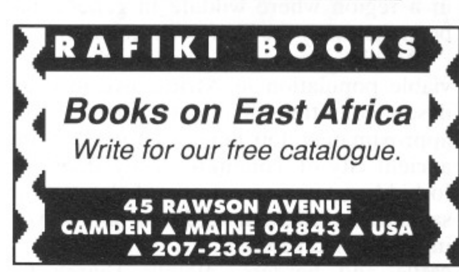

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The last Sahelian elephants

by Robert M. Pringle and Noumou Diakite

Traditionally a nomadic people, the Tuareg and Peul have coexisted well with the elephants. But now the introduction of gardening and agriculture threatens the relationship.

IF YOU want to appreciate the size of an elephant, look at one next to a cow. Mali, in West Africa, is one of the few places where this is possible in a natural setting. And, curiously enough, the unusual juxtaposition of bovines and pachyderms helps to explain why this most unusual elephant population has survived in a region where wildlife in general has been driven to the brink of extinction.

Mali's elephants, the northernmost viable population in Africa, live in near-desert conditions in the Gourma region, approximately 150 miles southeast of the ancient city of Timbuktu. They share the forbidding terrain – a mix of thorn-scrub savannah, ancient sand dunes, and towering butte-like formations – with goats, cattle and herders, mainly Tuareg (or Tamashek) with a scattering of Peul (or Fulani). The Tuareg are a Berber-speaking people, famous as desert raiders and highly stratified into sub-groups, including nobles, artisans, and former slaves descended from black African captives. The latter, known as Bella, are numerically predominant in the Gourma today. Because the Tuareg regard the elephants as harbingers of natural well-being there has, quite remarkably, been little poaching in this part of Mali. Instead, man and elephant have their most deadly foe in common – drought.

As recently as the 1960s, Europeans living in Mali hunted elephants and a wide variety of other game in many locations, some not far from the capital, Bamako. Giraffes were common along the great bend of the Niger River; today all but a handful are gone. The type specimen of one form of the dama gazelle, the largest of all the gazelles, is from nearby Hombori. All that remains in the Gourma today is a scattering of smaller antelope, some wary lions, and maybe a few cheetahs. Even the once-common ostrich is rarely seen.

An expedition to view these elephants bears little resemblance to a commercial East African safari. They aren't in a park, and no tourist facilities are available. Accustomed to herdsmen on foot, they tend to spook at the sound of engines, so tourist vans with pop-top roofs wouldn't work, even were such a thing available in Mali. They are most easily located at the end of the dry season, a period of extreme heat and frequent sand storms, when they congregate around a limited number of shallow, seasonal lakes and ponds.

Livestock and elephants coexisted well.

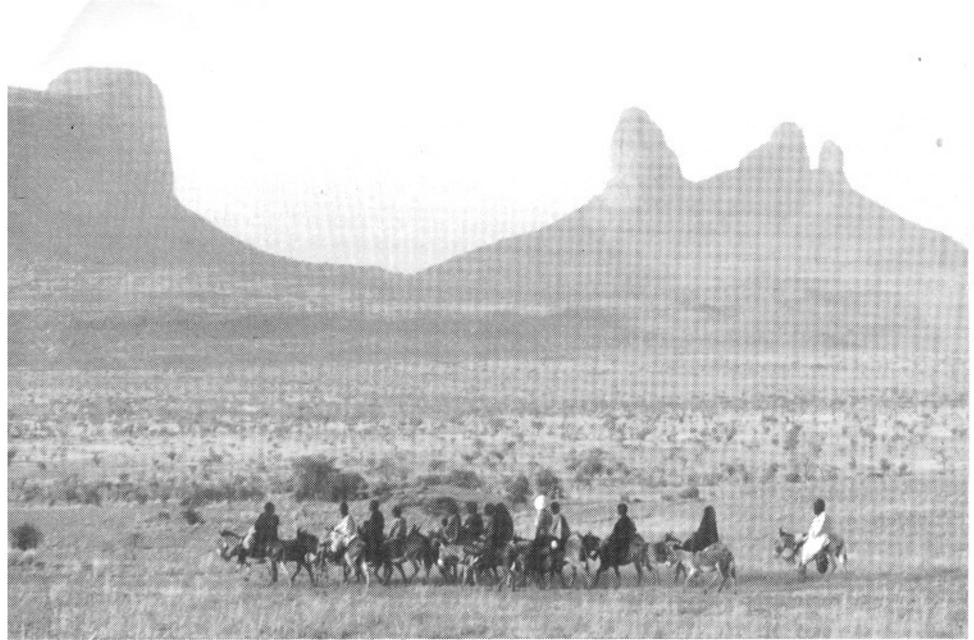
Christian Barbier / Perrier

On a recent visit we spent many dusty hours lurching along dry, winding water courses littered with elephant manure and smashed acacia branches stripped by the giant animals, seeking information from scattered Tuareg informants. We finally saw, not the elephants themselves, but a huge cloud of dust boiling up from a herd fleeing the sound of our Land Cruiser engine. We managed to approach them just at dusk, a file of about seventy elephants migrating eastwards between seasonal lakes, with many juveniles in evidence.

The next day we continued to Indiatafane, a back-country government post where nearby shallow lakes are among the best places to see elephants. Indiatafane consists of a mud-brick government building or two, a few wells, and a scattering of Tuareg tents. The district officer is the only official in town with a vehicle – a motor scooter. The veterinary technician uses a camel to make his vaccination rounds. The wildlife service representative, officialy responsible for the elephants, relies on shanks' mare, but he was nonetheless able to guide us close to a healthy family group of female elephants and calves. As usual, the elephants were in close proximity to Tuareg cattle, goats and herders – mostly small boys – around the muddy, thickly-wooded lake shore. Approaching quietly on foot, we were able to get within fifty or sixty yards of the elephants, to observe babies frolicking and adults drinking and applying cooling mud. There were at least fifty of them, with many infants.

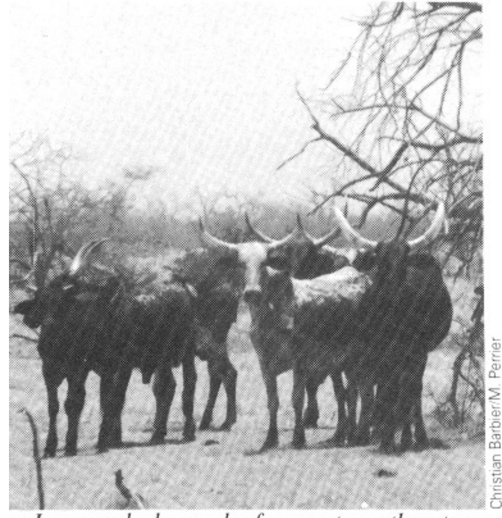
Later, back in Indiatafane, a Tuareg noble complained to us that the elephants were becoming a nuisance, fouling the water needed by local livestock. Despite such complaints, elephants and pastoralists have traditionally coexisted in the Gourma area. Southbound camel trains loaded with salt from mines in the deep Sahara have crossed the area for centuries and still do, returning north with cargoes of grain. Indeed these elephants are surrounded by ancient human habitation, from Timbuktu in the north to Hombori, located at the centre of the elephants' modern migration circuit, whose Songhay inhabitants arrived as refugees from the northeast when Moroccan mercenaries toppled the Askia Songhay empire in the 14th century.

In this predominantly pastoral area, elephants did not compete with livestock – there was plenty of forage for all. People respected elephants for their size and grandeur, and associated their presence with good years when the rains came. Virtually all Moslems, some local inhabitants are said to believe that a prayer delivered from a mat made from an elephant's ear will instantly reach God, but this belief does not seem to have encouraged poaching.



Spectacular escarpments and formations are some of the natural attractions to this region.

Looking for elephants in dry river bed.



Increased demands for pasture threatens coexistence of livestock and elephants.

In this predominantly pastoral area, elephants did not compete with livestock — there was plenty of forage for all. People respected elephants for their size and grandeur, and associated their presence with good years when the rains came.

Elephants have now been thrown into competition with people.

While the elephants are generally reputed to be placid, there are of course exceptions. At Indiatafane, we heard about an old man who had been killed when he got between a mother elephant and its calf. In many parts of Africa, the entire community would have taken revenge on the elephants, but the Tuareg, otherwise famous as warriors, did not retaliate.

Unfortunately, this benign situation is under stress, for at least two reasons. First the two great Sahelian droughts (1971–74 and 1984–85) have displaced many nomads from even drier areas to the north, increasing demand for Gourma pasture and water, and throwing elephants and people into competition. Today about 100,000 humans and 350,000 cattle, goats, camels and donkeys share the Gourma with the elephants. Second, and far more serious, the local people, encouraged by a variety of foreign donors, have started cultivating crops around the ponds. Using a technique traditional along the Niger River, farmers plant sorghum or millet at the muddy borders of receding seasonal ponds. The land retains moisture long enough to produce a crop. Vegetable growing is also becoming common place, and it goes without saying that elephants and vegetable gardens do not mix.

The situation has become acute around the large, shallow lake at Gossi, one of the only two in the Gourma (the other is at Banzena) that rarely dry out. Here a band of young male elephants has in recent years taken up what appears to be permanent habitation, abandoning the traditional migration route followed by most of the Gourma elephants. (Typically, and the Gourma population is no exception, adult male elephants move as individuals or in small groups, separate from larger, femalled family groups). Conflict with the sedentarized villagers is becoming a serious problem.

But the biggest threat to the elephants in recent years has been drought itself. In 1984, at least forty elephants died for lack of water. Thirst-crazed elephants drove villagers from their wells around Lake Banzena when it dried out. More would have died, but the provincial livestock authority (directed by co-author Diakite) brought water in by tank truck and saved some of them.

The Gourma elephants have never been studied in depth. Although sub-specific categorization of elephants remains a subject of scientific debate, these are normally classified as *Loxodonta africana oxyotis,* the West African savannah elephant. They are also known simply as Sahel elephants ('Sahel' is an Arabic word meaning 'below the desert'). They bear a strong resemblance in size and configuration to desert-dwelling elephant populations in Namibia and elsewhere. They are larger than the elephants of southern Mauritania, probably now extinct, which may have been the last link to the North African elephants of Hannibal, *Loxodonta africana pharohensis.* While the animals are massive, weighing up to seven tons, the tusks are short and thick, a deficiency which may explain why they have apparently as yet not been targetted by ivory poachers. Both the social behaviour and the biology of the Gourma elephants are essentially similar to other populations in similar terrain.

Today these creatures are the isolated remains of what was undoubtedly a much larger population of West African savannah elephants. Approximately five hundred of them follow a migratory track over 800 kilometres in length centred approximately around Hombori.

... Sahelian

According to Dr Anthony Hall-Martin, a wildlife biologist who has studied elephants throughout Africa in his book *Elephants of Africa,* 'this is the longest elephant migration on record, easily exceeding the 180 kilometre return movements of elephants reported in Chobe and Etosha (Botswana and Namibia) in the similarly arid southwestern part of the continent'.

During the rainy season (late June to early September) the elephants move southwest toward an area of seasonal streams along the Mali-Burkina Faso border, where they disperse in search of the plentiful pasturage available. After the rains, during the relatively cool winter months, they return northeastwards into the Gourma. This is the time when the elephants are in the best physical condition, when calves are born, and when most breeding activity takes place. During the heat of March, April and May they congregate in large family groups near seasonal pools – Indaman, Indiatafane, Banzena and others. They always remain south of the Niger River.

In 1910 Captain A. H. W. Haywood of the British Royal Artillery passed through the Gourma enroute to Timbuktu. An enthusiastic hunter, he shot everything in sight, including two elephants on the shores of Lake Niangaye, near modern Bambara-Maounde. Today the Gourma elephants do not range quite so far east, presumably because they tired of being hunted by the numerous voyagers (such as Haywood) travelling up and down the Niger, and retreated away from the river. In his book, *Through Timbuktu and across the Great Sahara,* Haywood noted that elephants were reportedly common elsewhere in the Niger valley at that time, including a mysterious 'red' variety, supposedly small of size and fierce of temperament, but he actually encountered elephants only in the Gourma.

The Gourma terrain alternates between enormous sand dunes (most of them ancient), seasonal watercourses choked with brush and trees, and spectacular escarpments and formations of pre-Cambrian sandstone rising 2,000 feet above the plain. Although rainfall is sparse (about 300 millimetres in a good year) the seasonal watercourses are choked with brush and trees, and in good years grass covers much of the surrounding countryside. Like all those of the Gourma are extremely water-dependent and sensitive to extremes of heat. Their normal hot season routine consists of staying near ponds during the day, where they are sheltered by trees and can drink and coat themselves with soothing mud, faring forth at night to seek additional food.

Since 1985, there has been no major drought, and the existence of numerous infants suggests that the Gourma elephants are in reasonably good condition. Nevertheless, increasing incidents of conflict with the local population prove beyond a doubt that their future is threatened. A new potential problem emerged in June 1990, when Tuareg insurgents attacked government outposts in eastern Mali. In March 1991, President Moussa Traore was ousted after he attempted to suppress forces demanding political liberalization, and in ensuring uncertainty, sporadic Tuareg unrest affected wide areas of central Mali. Although the elephants have not yet been hurt, the unrest could complicate the development of measures to protect them.

At present, all hunting in Mali is theoretically illegal, but the ban is widely ignored by villagers and others. A portion of the Gourma itself was classified as a reserve as long ago as 1959, but nothing was ever done to implement this move, and by the 1980s the fact of the supposed 'reserve' had been almost completely forgotten by the local populace and by officials in Bamako alike.

In recent years, however, visitors to the Gourma have begun to publicize the existence of this remarkable wildlife resource, attracting the interest of conversation-minded Malians and foreigners alike. In general, there is little doubt about the broad outlines of a suitable protection regime.

To begin with, additional research is needed on the numbers and migratory behaviour of the Gourma elephants. Then a real park should be created with guards recruited from among the local population. The most critical need is to separate the elephants from regions such as Gossi which are under increasingly intense cultivation. It is likely that this can be done by building earthen dams to impound the seasonal rains and create alternate sources of water reserved for use by the elephants, a technique which has worked well under somewhat similar conditions at the successful Nazinga Game Ranch on the Burkina Faso - Ghana border. Finally, it should be possible to reintroduce additional local species which today are either threatened or vanished from the area, including ostrich, dama gazelle, and roan antelope. Once a protection plan has been devised and accepted by the Malian government, foreign aid donors will probably be willing to help finance it. Already the World Bank, the International Union for the Conservation of Nature, and the European Economic Community have encouraged activities which might lead to a Gourma elephant project.

Opposite page; Top right: A group of elephants migrating westwards.

Middle left: Note weak tusk development characteristic of these elephants.

Centre: Tuareg camel trains which carry slabs of salt over a 1,000 kilometres.

Middle right: Author looking for elephants.

Bottom: Clouds of dust up from a fleeing herd.

Wildlife tourism could become a valuable economic resource in this region of Mali, just as it has in many other areas of Africa. The Gourma is only half a day by road from the regional capital at Mopti, and lies in close proximity to many significant historical, cultural and natural attractions, including Timbuktu, the country of the Dogon cliff-dwellers, the towering rock formations of Hombori, and the Niger Inland Delta, one of Africa's great wetlands, dotted with ancient towns and a winter destination for vast populations of waterfowl. The varied population of this part of Mali – Peul, Dogon and Tuareg – make it one of the most culturally interesting on the continent.

Today, if you visit the Gourma elephants, you will be welcome to base your expedition from the mud-brick compound of the Chief District Veterinary Officer, known affectionately to some of its habitues as the 'Hombori Hilton'. But in the future, Hombori will be a natural setting for a real hotel, game lodge, or tented camp facility that would attract visitors to this little-known corner of Africa and its unique population of elephants.

Robert M. Pringle, currently Director of Central African Affairs at the Department of State, is a career Foreign Service Officer. He was US Ambassador to Mali from 1987 to 1990.

Noumou Diakite, a veterinarian by training, heads the Mopti Regional Livestock Development Authority (Operation de Development de l'Elevage dans la Region de Mopti ODEM) in which capacity he has studied the Gourma elephants for some years, as well as helping them survive in time of drought. He is also the founder and leader of a voluntary organization, Elwan, dedicated to the preservation of the Tuareg elephants. ('Elwan' is the Tamashek word for "elephant.")

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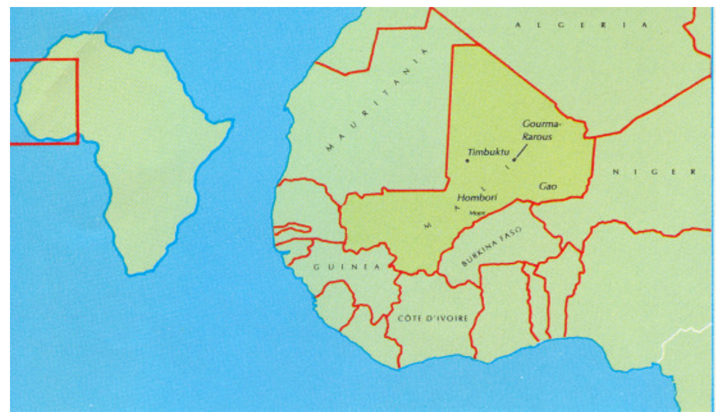

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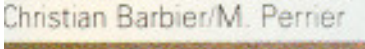
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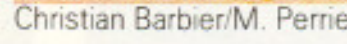
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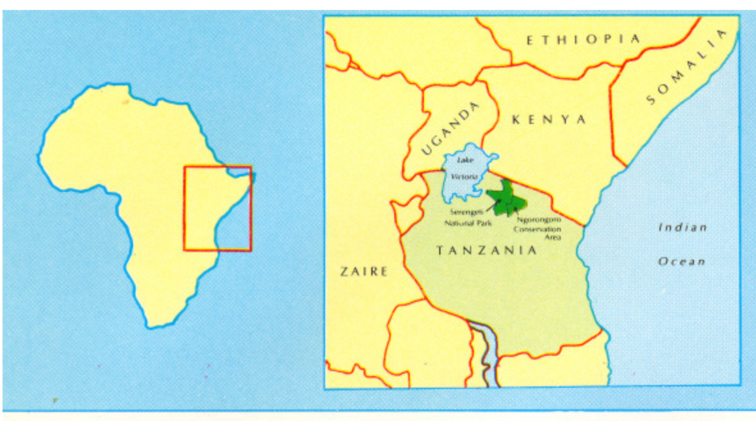
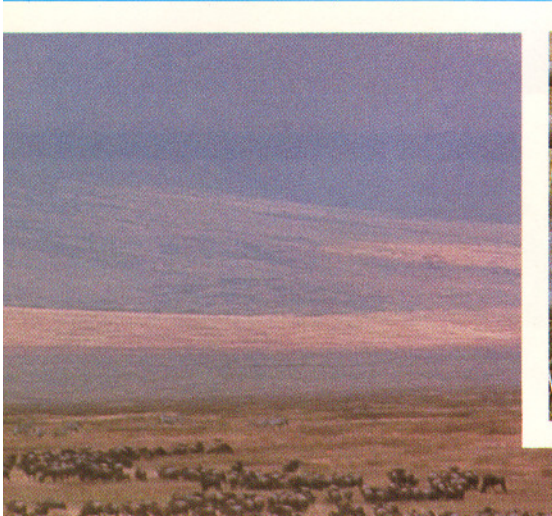
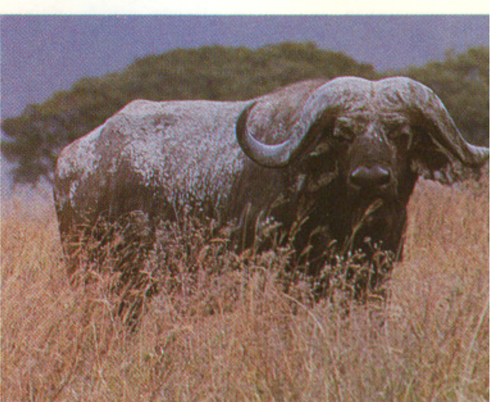






The many faces of conservation in Ngorongoro area, Tanzania

Story and photos by Andy Dobson

A FASCINATION with the dynamics of infectious diseases had brought me back to Ngorongoro Crater. My smile spread almost completely from ear to ear, my Land Rover was bumping up the road that led from the park gates to the crater rim and already I was in some of my favourite forest. Brightly coloured wax bills flew up before me in small flocks as I negotiated my way around the potholes. A herd of Cape buffalo eyed me apprehensively from a forest glade. Several years previously an outbreak of rinderpest virus had caused fairly widespread mortality in the buffalo population in Ngorongoro Crater. Like so many eruptions of disease in wildlife, the origin of the outbreak was unknown and the majority of damage done before scientists could be called in to determine the causes. By regularly visiting Ngorongoro Crater and reconstructing the history of both the rinderpest vaccination scheme and the size of different host populations, I hoped to design some computer programmes that would allow the Tanzanian veterinarians to more accurately predict and prevent future disease outbreaks. It seems a strange mandate for a conservation biologist, but pathogens that infect both wild and domestic animals cause many conflicts between wildlife conservation and pastoralists. Nowhere are these problems more acutely focused than in Tanzania.

Rinderpest first arrived in East Africa in the early 1890s. The Italian army imported infected cattle into Somalia in the Horn of Africa, and over the course of the next ten years the disease spread south to the Cape. In some places it is estimated to have killed over 90 per cent of the wildlife, particularly the ungulates. Contemporary accounts vividly describe the massive mortality; vultures were so full as to be unable to fly, the stench of rotting carcasses was unbearable in many areas, and many pastoralists starved as their cattle succumbed to the disease.

The increasing reliance of Tanzania's economy upon both a profitable tourist trade and a healthy pastoralist population, requires the maintenance of rinderpest free cattle. Since the development of a rinderpest vaccine, the numbers of cattle and the numbers of wildebeest and buffalo have

Opposite page:
Top right: Mixed herd of zebra and wildebeest.
Centre: Livestock after branding.
Centre right: Buffalo, like wildebeest, are susceptible to rinderpest.
Bottom right: Herders at the crush.
Bottom left: Wildebeest at time compete for forage with zebras.

been increasing steadily in Ngorongoro and Serengeti. However, maintaining a comprehensive vaccination coverage is expensive; after road maintenance, it is often the largest item in the parks' budget. As the duration of time since the last epidemic increases, people are less worried about the pathogen, assuming it is no longer a problem, and begin not to bring their cattle for vaccination. When combined with increasing densities of game, the probability of a disease outbreak increases, creating a situation that could be disastrous for both the cattle and wildlife.

The complex interactions between these biological, economic and epidemiological questions twisted round in my head as I arrived at the crater's rim and once again stared across the hundred square miles of Ngorongoro Crater. Large herds of zebra and wildebeest were feeding in the grassy areas at the north end of the caldera, the pink edge to Lake Magadi indicated that a huge flock of flamingoes were again using the lake, and the occasional sharp reflection revealed the presence of Land Rovers full of tourists patrolling the crater's floor in search of lions and rhinos.

The present distribution of many hoofed species still reflect the impact of the disease which continued to produce periodic epidemics up until the 1960s. In the 1950s, Walter Plowright, of the Animal Virus Research Institute in Pirbright, England, developed an attenuated rinderpest vaccine. This allowed the initiation of the first widespread vaccination schemes against rinderpest. These had an almost immediate effect; as the number of cattle vaccinated each year increased, the frequency of disease outbreaks declined and the ratio of cattle per pastoralist increased to levels of around twelve per person.

Curiously, although no attempts were made to vaccinate wildlife, the mortality of young wildebeest began to decline once vaccination of cattle was widespread 'Yearling disease' had previously been responsible for nearly 90 per cent of the deaths of immature wildebeest, its incidence declined precipitously. During the early period of increased cattle vaccination, levels of antibodies to rinderpest (immunological evidence of exposure to the virus) declined in wildebeest. Why should this happen when no attempt had been made to vaccinate any of the game? Furthermore, in areas where wildlife numbers were regularly monitored, scientists began to notice a significant increase in both the numbers of wildebeest and the predators that fed on them. In Serengeti National Park and Ngorongoro conservation region, the numbers of wildebeest increased from around 250,000, to around 2 million in the course of fifteen to twenty years.

Although August is the busiest time for safari tours, it is usually both the driest and coldest month of the year. Thick cloud often covers the crater's rim in the mornings and the sun doesn't break through until ten or eleven. A thick fog dripped from the epiphyte laden trees as I drove to veterinary headquarters to pick up John Mosha, a veterinary assistant with the Ngorongoro Crater Conservation Authority. We were going to spend the day at a vaccination crush near Empakai Crater in the north of the conservation region. Our early start put us ahead of most of the tourists; the Ngorongoro 'rush hour' doesn't usually start until nine o'clock when as many as twenty Land Rovers can often be seen winding their way around the rim of the crater to the descent road.

If we are to effectively manage the communities we wish to conserve, it is crucial to determine the relative importance of competition, predation and diseases in determining community structure.

Maasai children organize their day around the tourist rush and groups of young children with decorative beaded necklaces wobbled their heads in rhythm as we drove by, *Morani* warriors with elaborate white facial masks stared confidently at us. Declining ratios of cattle per person and an increasingly sedentary life style has increased the dependence of the Maasai on the tourist trade. Making sure that the cattle remain disease free should help reduce this dependence. The Maasai bomas, or homesteads, in the huge green valley to the west of the crater are surrounded by both dense herds of cattle and dispersed groups of Grants and Thompson gazelle; a rinderpest outbreak here could be readily transmitted to wildlife. As we reach the top of the ascent road, the full width of the crater again opens out around us and we look down through the clouds to Lake Magadi at the bottom of the crater.

The descent road is never less than stimulating. The lowest of low range gears are engaged as we slowly descend our way around potholes through the sparse forest of candelabra trees. The herds of zebra and wildebeest below us begin to come into focus, but constant attention is required to follow the eccentricities of the road; passengers quickly learn not to point out exciting sights to the driver! After about twenty minutes the steepest part of the descent is over and we discuss which way to circle the crater. If we go clockwise there's always a chance of seeing a serval, if we go anticlockwise we might see a rhino, but they don't usually emerge from the thicker vegetation until mid-afternoon. Clockwise, proves the correct choice; a young male serval prowls ahead of us as we turn left and just as we slow down, he pounces and catches a grass rat. Looking very pleased with himself he swiftly dismembers it and bounds off into the longer grass away from the lake.

We continue on round the lake, the road has been improved over the last few years and there are only a few stretches of swampy mud. Large mixed herds of zebra and wildebeest graze on the grass hillsides leading up to the crater's walls. Zebra are not susceptible to rinderpest, so an outbreak would have no direct effect on them. However, at different times of the year they may alternatively compete with wildebeest for forage, or help facilitate grazing by smaller ungulates by eating down the thicker vegetation. Curiously, their numbers have remained fairly constant in the Serengeti during the eruption of the wildebeest. Ecologists are perpetually fascinated with unravelling the mechanisms that cause the populations of some species to remain relatively constant in numbers from year to year, while others show periodic increases or decreases.

If we are to effectively manage the communities we wish to conserve, it is crucial to determine the relative importance of competition, predation and diseases in determining community structure. For example, if a disease outbreak reduced the numbers of other wildlife species, would the zebra subsequently suffer increased predation from the large numbers of predators which at present utilize a range of species? Or would the reduction in potential competitors allow zebra numbers to increase? The lions which stare lazily back at me from the shade of a tree at the turn-off for the crater's back road are unable to supply an answer.

Instead, a combination of long term studies, mathematical models and carefully designed experiments can provide insights on how these various forces interact. The removal of a disease by vaccination can be thought of as a type of experiment. Reconstruction of the vaccination history of Ngorongoro Conservation Area was one way of analyzing this experiment. As well as providing a means of monitoring the present levels of vaccination coverage, it might also provide insights into the role of pathogenic viruses in determining the relative numbers of different species in an ecological community.

The road up to Empakai Crater is more reminiscent of Scotland than East Africa; huge areas of open moorland disappear into the distance, while clouds cover the tops of the craters at Nainokanoka and Empakai. The occasional clusters of huts mark the few settlements that exist in this

almost deserted part of Tanzania, which although close to one of the largest wildlife attractions in the world, is almost completely unvisited. The road is covered by a deep layer of fine dust, which works its way into all parts of the car as we meander slowly up the road towards the vaccination crush. A vast valley, the Embulbul Depression, opens to our left, empty but for a few cattle. No game are present at this time of the year, but during the end of the rainy season in November it will be full of wildebeest, Grant's gazelle and buffalo. Maintaining a high level of vaccination coverage in this area is particularly important. As the road begins to climb to the rim of Empakai Crater, we start to notice dense herds of cattle on the surrounding hillside.

The vaccination crush at the bottom of a shallow valley forms the centre of attraction for these herds. We pull off the road and descend to the twin corrals joined by a narrow 'funnel'. Samson Kamau, the vet from Ngorongoro Crater, interrupts his careful count of the vaccination numbers as we approach. A fresh group of cattle are being led into the enclosure at one end of the tunnel. The Maasai herdsmen prod and cajole them into position. Two *moran* (young Maasai warriors) are heating brands in an open fire, these will leave an 'R' on the shoulder and a 'C' on the rump of animals successfully vaccinated for rinderpest and contagious bovine pleural pneumonia, respectively. An older Maasai offers us cups of hot congealing milk, with sugar and blood. I grin appreciatively and sip the pungent viscous liquid.

An increasing crescendo of shouting indicates we are ready to start vaccinating. The cattle enter the funnel one at a time, two vets stand on either side, each holding a multi-vaccination gun in his hand. One vet pushes his into the shoulder, the other into the rump, while the moran brand the cattle and the harsh stench of singed hair sends the cattle scurrying out of the funnel into the second corral. Here the herdsmen attempt to calm their startled charges. Eventually, when the herd has reassembled, Sam Kamau enters the numbers of vaccinations into his note book and the herdsmen drives the herd out of the enclosure and back up the hillside to graze. Another herd of cattle are driven into the first corral and the whole process begins again. A crush such as this one will be open for two to three days. During this period, three to five thousand cattle will be driven into it from a radius of ten miles.

For most of July and August the vets travel around the Ngorongoro conservation district setting up crushes and vaccinating cattle. By going back through their past records and computerizing their hand written reports, I can develop a suite of computer programmes that will allow them to monitor the levels of immunity in the cattle population. Analysis of the vaccination levels that preceeded previous rinderpest outbreaks, should allow the present vaccination coverage to be optimized so as to prevent a future outbreak. This is particularly important in areas where interactions between cattle and buffalo and wildebeest are frequent. Philosophically, this produces a curious kind of science; like so much of conservation biology we are attempting to design experiments we never want to falsify. These more esoteric thoughts occupy my day as each group of cattle are herded into the crush, vaccinated and branded. Worries about the lacunae between scientific philosophy and conservation reality are eventually suspended as John Mosha suggests we head back to the crater. We wave *Kwaheris* to the vets and Maasai herdsmen and slowly make our way back up to the Land Rover. As we head back towards Ngorongoro, I glance back across the valley at the medieval sight of circles of cattle covering a whole valley, each circle guarded by a Maasai.

As we drive back around the crater, a large herd of buffalo appear to our right running towards the swamp. I accelerate to get ahead of them and pull over to see why they're behaving in this fashion. Ahead of them a pride of lions are scattering in confusion, two females disappear into the tall grasses at the edge of the swamp, a male and several females keep running only a few body lengths ahead of the irate buffalos. Plainly their surprise attack has either failed miserably, or the lions have been caught napping by someone other than tourists. The buffaloes eventually slow down and while some start to graze, the older males sniff the air aggressively and survey their surroundings. The lions maintain a low profile and skulk off to search for alternative prey. We restart the Land Rover and slowly make our way back past the Lerai forest to the ascent road and the crater's rim.

At the end of the day, staring across my tea cup from the Lodge at the rim of the crater, I contemplate the complex interactions between wild animals, domestic animals, pastoralists and tourists that will ultimately determine the long term viability of Ngorongoro Crater. None of the equations are simple, but leaving out any component runs the risk of determining policy from a false perspective. Ecology may be complex but it's never short on images to stimulate our understanding of nature. The buffalo may be aggressive towards the lions and reduce their risk of predation, but they are essentially defenseless against rinderpest, a virus which could kill many of them much more efficiently than could the lions. Most of the tourists around me are delighted with the opportunity that Ngorongoro has provided to see so many carnivores and their prey. Although their initial image of Ngorongoro's ecology is one dominated by interactions between spectacular predators and their prey, the welfare of this system may be dependent upon the continued absence of a much more aggressive predator, the rinderpest virus. Maintaining a healthy population of cattle around the crater is thus crucial for the conservation of the whole community of vertebrates that utilize the crater. I continue to wrestle with the equations which will help me to understand this as the Ngorongoro sunset is reflected in the lake two thousand feet below me.

Andrew Dobson is presently a WCI Research Fellow in the department of Ecology and Evolutionary Biology, Princeton University, Princeton, New Jersey, USA.

Infection and vaccination

The principles underlying most vaccination schemes are essentially quite straightforward. Most pathogens produce some sort of immunity in their hosts. To acquire natural immunity, a host usually has to become infected by the disease. If the host survives infection by a virus such as rinderpest, it is then usually immune to further infections. In contrast, artificial immunity may be induced in a host if it is exposed to a radiated or otherwise inert form of the pathogen. This stimulates the hosts immune system to produce a response which prevents subsequent infection by the live pathogen. Because pathogens require a constant supply of uninfected, susceptible hosts if they are to persist in a population, mass vaccination presents a useful way of reducing the numbers of susceptible individuals. If levels of vaccination are kept sufficiently high, infectious individuals will fail to come into contact with susceptible individuals and the disease will die out in a population. Many human virus diseases, such as measles and rubella, are controlled by ensuring high levels of vaccination amongst children.

A considerable body of mathematical theory has been developed which allows epidemiologists to calculate the levels of vaccination required to control different diseases in humans. Some of this theory extends to diseases of wildlife; however, complications arise when pathogens can infect more than one host species, as is the case with rinderpest. Calculations to determine the levels of vaccination coverage required to control the disease have to consider variations in susceptibility between different hosts and the frequency of contact between different host species. Under these circumstances, ecological information becomes as important as immunological understanding, and in particular, the social and migratory habitats of different potential host species are critical in determining rates and routes of transmission. As cattle are the only species which can be safely and economically vaccinated for rinderpest, the problems with designing an effective vaccination scheme are particularly acute. Luckily, control of the disease in cattle, seems to have led to the disappearence of the pathogen from wildlife, suggesting that cattle are the primary carriers of the disease. But viruses are always producing new mutations, variations which always have the potential to surprise you.

Kibale Forest Tourist Project

by Alice Mason and Jason Rubens

Another pioneer project that is attempting to combine environmental protection with economic growth.

ABSENT from tourist itineraries and neglected by the guide books, the forests of Uganda are perhaps the least well known of all East Africa's wildlife habitats. Most of Uganda's forests, from Semliki on the Zairean border to Budongo, Burindi, Bugoma and Kibale in Western Uganda are remnants of the outer fringes of the great equatorial forest that sweeps through the Congo Basin. In Uganda, this once all consuming forest has been fragmented by settler encroachment, logging and agriculture. This scenario has affected not only the geography of the area, but also the biology of the forest in question. In Western Uganda what remains is not a broken line of identical forest areas, but a series of forest 'islands', each with its own biological identify.

Whilst all the forests in this group share the characteristic of having high species density, the particular species composition of each 'island' is highly individualised.

In pure conservation terms, these forests have enough intrinsic value to warrant them being totally protected from all forms of human activity. However, such exclusive protection is no longer available; in these days of harsh realism, conservation must pay and national parks and reserves can ensure proper protection only when they become economically self-sustaining. The only way that this can be achieved is through the utilization for economic gain of natural resources that lie within the park boundaries.

The management of Kibale Forest in Kabarole District, Western Uganda, has already begun the long journey down the road to self-sustainability. With the active support of the Ugandan Forest Department and financial assistance from the United States Agency for International Aid (USAID), the management has begun a programme of non-consumptive wildlife utilization based on education and tourism.

The Kibale Forest Reserve management plan centres around the Makerere University Biological Field Station (MUBFS) which is situated at Kanywara on the edge of the Forest Reserve. The Field Station was originally set up in the early 1970s as a small centre for primate research. It became the Biological Field Station of Kampala's Makerere University in 1987. Since then it has grown and its role has broadened considerably. In the last three years, under the overall supervision of co-directors, Dr Andrew Johns and Dr Isaberia Basuta, MUBFS has widened its research interests and extended its premises to provide accommodation, teaching and library facilities for visiting students and professors. Due to these developments MUBFS is now an important international education centre.

In addition, the Forest Department, in conjunction with the MUBFS management has developed a strong programme of extension work. This is designed to take the message of conservation outside of the close confines of scientists and administrators, and in so doing to provide a source of information to local people about the forest, the reserve and its work.

All of these developments are utilizing Kibale's wildlife for educational benefit, but education has never been a real moneyspinner. Although in the long-run MUBFS may well be in a position to finance its own activities as an education centre, its chances of earning sufficient profits to maintain the reserve as a whole are slim.

In searching for solutions to this economic headache the reserve management began to consider tourism as a potential source of income. Tourism is a big money industry, especially the kind of safari tourism for which East Africa is famous. The profit margins within the tourist industry are also large. This is particularly true of the East Africa region where the tourist industry is aimed largely at foreign visitors whose purchasing power is high. Thus prices charged for tourist services can be much higher than prices for local goods and services, hence profits can be maximised.

If some of this profit can be collected directly by national parks and reserves and ploughed back into conservation, it can be directed so as to subsidize the high overheads of wildlife management. Thus national parks and reserves can eventually become economically self-sustaining.

With these economic arguments in mind MUBFS, the Forest Department and USAID have combined their expertise to draw up a management proposal for a tourism project at Kibale Forest.

Of all Uganda's forest areas, Kibale Forest Reserve is perhaps the most suitable for the development of tourism. The forest is of great biological interest. It contains 209 recorded tree species as well as a wide variety of sub-canopy flora. There are also several accessible swamps and grassland sites which add yet more species diversity to the reserve's vegetation. Of interest to ornithologists are the vast number of birds; over 300 species have been sited within the reserve boundary. These include migrants, grassland and wetland species as well as the many resident forest birds. There are also butterflies in abundance. A full butterfly inventory has not yet been made, but a recent visit by a lepadoptorist recorded 144 species in just three days. In addition to the butterflies, Kibale Forest is home to hosts of other insects and a number of reptiles; resident snake species include the rare Jameson's mamba, the puff adder and the impressive horned or rhinoceros viper.

Of the mammalian species, Kibale's residents include: bushbuck, duiker, buffalo and, often heard though rarely seen in the dense forest, Uganda's third largest elephant population.

However, perhaps most important, certainly from the point of view of attracting tourists, is the abundant primate fauna. There are eleven different primate species resident in the forest, these are: the red-tail monkey, blue monkey, L'hoests monkey, black and white colobus, red colobus, mangabey, baboon and chimpanzee. Of these the L'hoest's monkey, the red colobus and the chimpanzee are classified as rare. There are also three nocturnal species which are rarely seen and about which little is known. These are the dwarf bushbaby *(Galago demidori)*, the inustus bushbaby *(Galago inustus)* and potto *(Perodictius potto)*.

Of all Kibale's resident species the one which arouses most interest is the chimpanzee. It is these 'little-men' that are likely to be the biggest crowd-pullers.

Apart from these natural 'attractions', Kibale has certain practical features which favour its development for tourism. Firstly, Kibale is easily accessible; the main Fort Portal-Mbarara road runs right through the reserve and is presently being upgraded. Thus private vehicular access to the reserve will become easier, and public transport more reliable.

Secondly, Kibale lies on Uganda's main tourist route, sandwiched between Queen Elizabeth National Park, the Ruwenzori National Park and the towns of Fort Portal and Kasese which serve as access centres for other attractions in this area. Thirdly, an existing administrative infrastructure of the reserve is already firmly established at MUBFS. This means that capital investment for any new development can be kept to a minimum since the tourist site and MUBFS will work collaboratively so as to reduce both the costs and the administrative burden of running two centres.

With these three factors in mind, MUBFS and the Uganda Forest Department began planning a programme of non-consumptive wildlife utilization based on tourism for Kibale Forest.

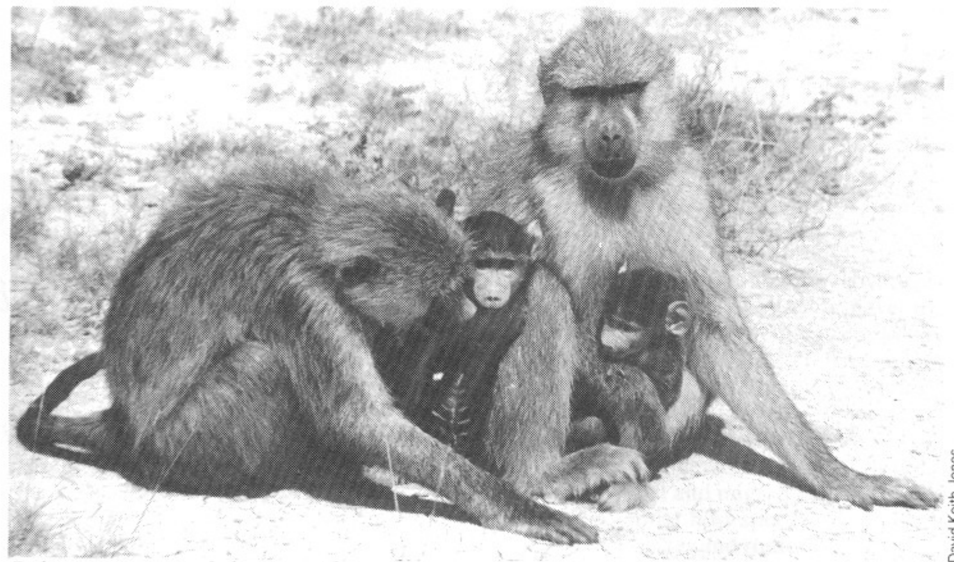
Whilst the onslaught of tourism will undoubtedly change the face of the reserve, it can also, if carefully managed, build on the existing aims of MUBFS, expanding the base of the centre's educational work and extending its discoveries to a wider audience. This basic ethos has been the guiding force behind the tourist programme in all stages of planning and implementation.

Planning for the tourist project began in 1990 with the production of a tourism management plan. Finance was secured under the terms of the USAID package which has funded the various developments at MUBFS. A memorandum of understanding was signed with the UK based Society for Environmental Exploration who were invited to implement the management plan in the field operating under the name FRONTIER.

The Kibale Tourist Project is the first FRONTIER venture to take place in Uganda. It commenced in July 1991 with the arrival of the project's co-directors Nicholas Smith and Julie Grainger and an initial group of eighteen volunteers recruited in the UK.

Working under the overall supervision of MUBFS co-ordinators, FRONTIER began by surveying the Dura River area of the reserve. This area was chosen for development largely because of the presence of at least one troop of wild (unhabituated) chimpanzees. It is also situated at a sufficient distance from the MUBFS site so that any activity there will not disturb the Field Station's research work.

After doing feasibility studies on a number of sites within the Dura River area, the FRONTIER team proposed to start construction work on a patch of grassland adjacent to the Kanyanchu River.



David Keith Jones

Baboons are one of eleven resident primate species.

The rare red colobus will be one of the major attractions.

Working alongside local people, FRONTIER cleared and levelled the site before beginning actual building work. Although the tourist accommodation at Kanyanchu River Camp will be in tents, at least two buildings were deemed necessary; one as a reception and education centre, another as an accommodation block for permanent site staff. In addition, toilet and shower facilities, cooking grates and wood and palm shelters (to provide shade for tents) are also being built.

The FRONTIER team have been responsible for all the surveying and planning for the site and the buildings as well as being heavily involved in the physical work. They have spent some time learning about local building techniques in order to find appropriate solutions to the problems encountered when planning for a difficult environment. Although the building work is not fully completed, Kanyanchu River Camp already has sufficient, good quality facilities for visitors with their own tents to camp comfortably. The site has been accepting visitors on this basis since January 1992.

Whilst the early construction work was ploughing ahead, FRONTIER personnel were also working alongside Ugandan field assistants and local workers mapping the forest immediately adjacent to the campsite. A series of nature trails have been cut for use by visitors to the site. Peace Corps volunteer, Mark Noonan, and USAID'S Jennifer Gradowski have also been working alongside the others on this project as well as supervising a training programme for forest guides.

These guides, all recruited locally, will accompany tourists on walks around the trail network. They are invaluable to the tourist facility, providing a wealth of information about the forest and its inhabitants. The availability of these guides reflects specifically the educational bias which is intrinsic to the Kibale Tourism Management Programme.

This guide system together with the provision of the educational centre are seen by the management as crucial to the role of Kanyanchu River Camp as a centre for education as well as for leisure. The provision of such facilities should enhance the experience of visiting Kibale far beyond the simple voyeurism of much 'safari' tourism and will give foreign tourists and local visitors alike the opportunity to learn, first hand, something of the intricacies of forest ecology.

The management of the Kibale Forest Reserve is keen to ensure that the tourism project based at Kanyanchu River Camp is developed in a way that encourages a holistic experience for the visitor. For this reason 'chimp tourism' as such is being discouraged. Having said that, the Kibale chimps are an integral and extremely interesting part of the forest.

The exact number of the Kibale chimp population is uncertain. There may be as many as 500 individuals roaming in the forest. Two large chimp groups have already been habituated for research work. Now a programme has been set up by FRONTIER volunteers and MUBFS staff to habituate a third group of chimps. This third group is ranging in the Kanyanchu River area and will therefore be directly affected by the tourist development.

Habituation involves conditioning the chimpanzee to the presence of people so as to override their natural instinct to flee from human beings. The habituation process is purely benign in intention and is designed simply to facilitate chimp watching. It is, however, a delicate and time consuming occupation.

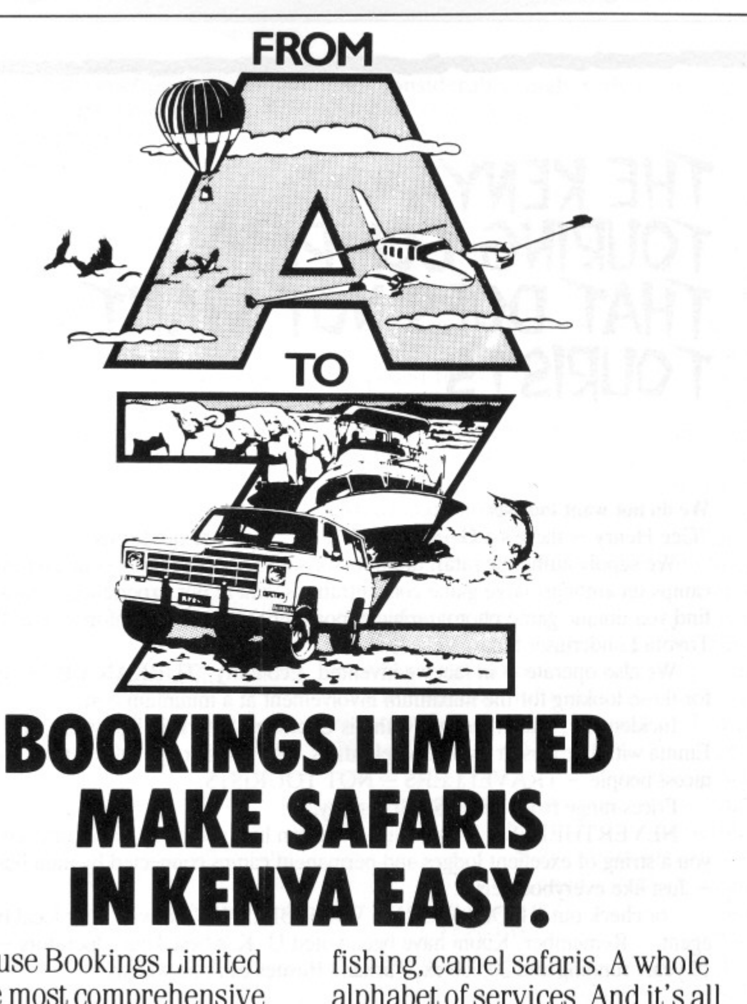
Habituation work begins with a small group of people, usually no more than three, regularly visiting parts of the forest where they know or suspect chimps to be feeding. It is necessary to stay with the chimps for long periods of time, observing their behaviour whilst making every effort to be unthreatening. Gradually the chimps become comfortable with the human presence. Once this stage is achieved it is possible to spend long hours with the chimps watching their antics and observing the minutae of their daily lives. It is also possible to take tourists to view them.

Problems that have arisen from past habituation programmes include: increased risk of poaching; since the animals no longer fear humans they become easy prey for hunters; increased risk of disease; close contact with humans can lead to the passing of dangerous viruses from humans to the animals. This is particularly relevant to chimps who are extremely susceptible to human diseases.

The Kibale tourist programme intends to avoid problems such as these by implementing a programme of limited habituation. This involves an extremely slow and entirely passive habituation process. It is based almost entirely on passive and relatively distant encounters with chimps who are in fact discouraged from coming too close to the observers. If they should, for example, try to touch the person or people observing them, then the observers will move away. Partially due to the slow process of habituation and partially to the commitment to limited habituation, chimp viewing at Kibale will not be 'top of the bill'. Specific chimp watching facilities will not be fully operational until mid 1993. Until then chimp sighting must be considered as a bonus for tourists lucky enough to achieve it.

The limited habituation programme being employed at Kibale reflects the whole ethos of the Kibale tourist project. The entire venture has been constructed so as to ensure maximum revenue from non-consumptive wildlife utilization thus maximising profits while minimising environmental impact. The tourist project is a positive attempt to make the Kibale Forest Reserve economically self sustaining. Thanks to the commitment of the Forest Department, MUBFS, FRONTIER, USAID and the Peace Corps, this innovative project has managed to combine environmental protection with economic growth. If it succeeds, the Kibale tourist project will join other pioneers in the field of genuine eco-tourism and may likely become a blue print for other tourist developments in East Africa.

Alice Mason and Jason Rubens are freelance photographer/journalists specialising in environmental issues. Alice is based in Nairobi but travels regularly to Tanzania and Uganda to cover subjects there. Jason is based in London.



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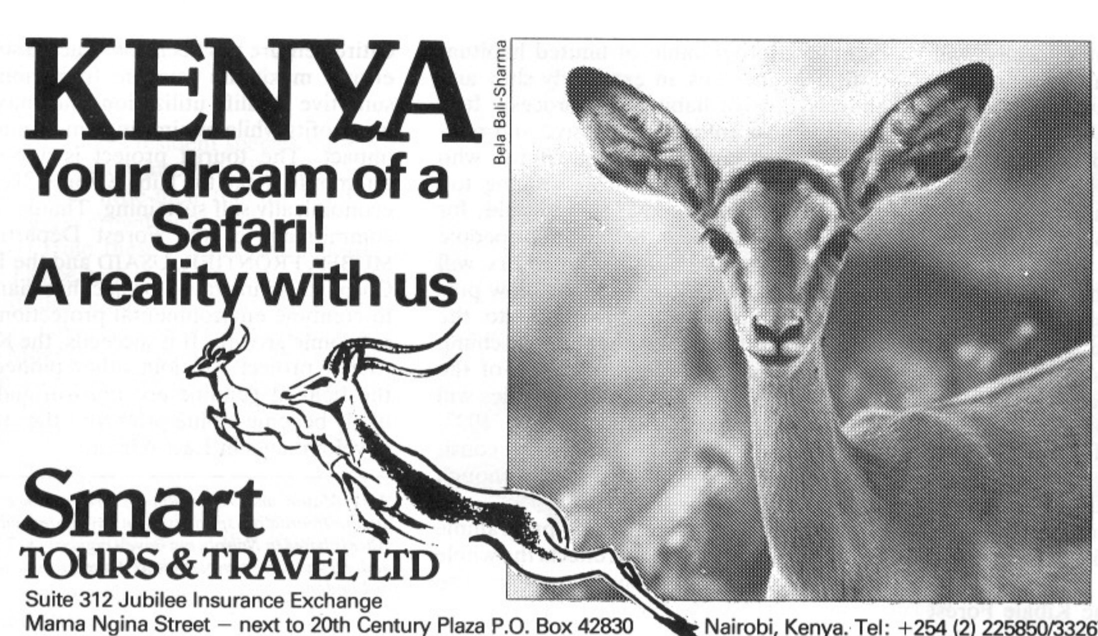

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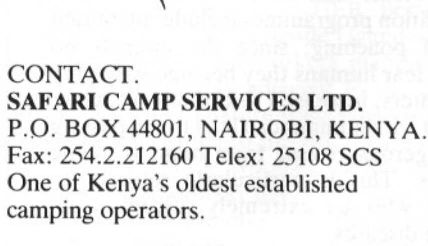

Tourists on the reef

We recently went on one of your trips (Wasini Island Restaurant and Dhow Tours) to Kisite Marine Park. Aside from the matter described below, we had a lovely day – the restaurant was terrific, the boat prompt, staff were friendly, and the reef extraordinary.

We are writing, however, to express our great concern about the behaviour of a number of the tourists on the reef, and the lack of supervision provided by your staff and the park service rangers. When we arrived at the reef, one of your staff gave only a brief warning not to stand on coral or collect shells. Aside from its brevity, the warning missed at least half of the tourists, as they spoke only Italian and French. The group was then allowed in the water, and several people immediately made their way to the coral, where they began standing and literally stomping on the coral. In several cases, we independently witnessed individuals breaking off pieces of coral of at least six inches in length! The scene can only be described as carnage; it was truly horrifying.

The staff and rangers seemed unaware, or if aware, unperturbed. We attempted to tell several people to get off the coral; they stared blankly back, either not comprehending (hard to believe, since we gestured quite clearly), or not caring.

It is clear to us that if this kind of unsupervised unleashing of ignorant tourists on the reef continues, there will be literally nothing left in a short time. Apart from the obvious moral issues involved here – the need for respect of species other than our own, the responsibility to preserve the environment for future generations, and other issues you must certainly be aware of – we imagine that it is simply bad business to allow this destruction to occur. We suggest the following possible remedies:

Issue to each tourist a list of rules for visiting the reef, and print it in at least French, German, Italian, English, and Kiswahili.

Have an appropriately stern and imposing-looking ranger give a serious speech on these rules; then have your staff translate it into the languages of the non-English speaking tourists (we noted that one of your staff was fluent in Italian).

The park service should fine individuals for collecting shells, and each tourist returning to the boat should be requested to demonstrate that his or her pockets are not hiding shells. We witnessed one fellow who brought a shell on board; the Italian-speaking staff member told him to throw it back, and the fellow resisted until the park ranger came over.

You must provide guides to the reef, who swim along with the tourists. Or at least, post a few *attentive* staff in the water at certain points around the reef to act as observers and reef guards. Guests who stand on or break off coral should be warned; on the second occasion they should be asked to return to the boat.

Fins should be provided to *all* guests, and a 10–15 minute training in use of snorkel and fins should precede movement to the reef. Our impression was that in some cases, individuals stood on or leaned against coral because they lost their balance, panicked, and did not know how to float or to move away from the coral.

We will be leaving Kenya soon, but hope to return in a few years. We would like to take your tour once again to visit the reef – but we fear that without immediate preventive measures being taken, there will be nothing to visit.

Peter Fraenkel, Ph.D
and Heike Schulte-Goecking
UNICEF
P.O. Box 44145, Nairobi.

Shells, corals and fish are sold as souvenirs.

More about marine conservation

I am afraid that Dr McClanahan's 'Last word on marine conservation' (Letters, *Swara* March / April 1992) is by no means the last word.* A great deal remains to be said.

I take exception to the unprofessional and uncalled for criticisms he has levelled at Melita Samoilys. We must assume he is reacting to her article in *Swara,* July / August 1991, or perhaps to her Technical Report, because he has omitted to cite the offending source. If this is so, he should read both again, carefully.

McClanahan writes that Samoilys 'has argued that no overfishing has occurred in Diani Lagoon and that there is no relationship between sea urchin abundance and their fish predators'. His first statement in this sentence is a muddled untruth. Samoilys' *Swara* article is about *Coral reef* (implicit enough in the title, I would have thought) and not about lagoons. In her Technical Report she states that fishing pressure on shallow accessible areas (inner reef slopes, reef flats, lagoons) is likely to be considerably higher than on the reef slopes she studied. In neither has she argued or implied that no overfishing has occurred in Diani Lagoon.

While Samoilys found no evidence that the high numbers of sea urchins are the result of the removal of their predators, she qualified this. I quote: 'a couple of points must be stressed. The results are inconclusive because only two sites were involved. In addition, I worked on the reef slope as opposed to the lagoon where McClanahan and Muthiga worked'. Having issued this caveat, Samoilys is fully entitled to interpret the results of her studies in her own way, whether this is in agreement with McClanahan's theories or not.

McClanahan's temerity in calling into question the East African Wildlife Society and World Wide Fund support extended to Samoilys for her reef slope project is also uncalled for. Her report on this timely, necessary and excellent study has provided much valuable information which is of direct relevance and interest to Fisheries Department, to Kenya Wildlife Service, and to conservation organisations in general.

I take this opportunity of putting on record, again, that I do not subscribe to McClanahan's concern about high densities of sea urchins in Kenya's shallow lagoons, nor to his theories in this regard. In a letter to *Swara* May/June 1988, I questioned his premise that high densities were due to the removal of predatory triggerfish as a consequence of overfishing. I retain this doubt, and again suggest that high densities may equally be a matter of ecology: conditions in certain sectors of Diani Lagoon provide prime habitat. In any event high densities do not occur throughout the lagoon: they are localised and constitute no threat to it. That is my opinion and, like Melita Samoilys, I am entitled to interpret what I observe in my own way, and to say so.

Over 200 species of fish occur in Diani Lagoon waters today, the community structure being much the same as it was 20 years ago. This high species diversity suggests, to

have undoubtedly been reduced by uncontrolled and indiscriminate net fishing. It would be very surprising indeed if they were not. It is consequently and manifestly desirable to impose reasonable controls on fishing and to impose reasonable conservation measures more generally. That has been obvious for well over twenty years and we hardly need McClanahan to tell us so now.

In conclusion, I disagree entirely with McClanahan's proposals to remove all controls on shell collecting (save for three species) and to encourage this activity even into deeper water. I can but hope that KWS, under whose purported aegis he presented this letter, do not subscribe to his fatuous views. But then, if I may borrow his words, I fear I am one of those ignorant armchair conservationists with certain old-fashioned views embedded in my mind.

Scientific research generally thrives on questioning, argument and controversy. If some of it appears fruitless to McClanahan, he would do well to learn to accept it with equanimity and with a great deal less arrogance.

Dr K R Bock
P.O. Box 641
Ukunda

**'Lastword on marine conservation' as title of McClanahan's letter was the Editor's interpretation of the tone in which the letter was written.*

From Tsavo National Park

Thank you very much for your continued supply of *Swara* magazine to me. I particularly appreciate the March/April publication which raised many interesting issues.

I wish to take this opportunity to thank you very much for your nice articles which are very educative on the importance of the conservation of our natural heritage - wildlife. Indeed wildlife and environment are symbiotically inseparable hence collective and concerted effort to conserve and protect them is of paramount importance.

By the way, Taita/Taveta District has alot to offer. It is the home of the world renowned Tsavo National Park which occupies 62 per cent of the entire District area. In your next issue let us have something on it.

N. W. Otido
District Environmental Officer,
Taita/Taveta District, Kenya.

Osprey breeding at Naivasha?

In Dorothy and Geoffrey Irvine's excellent article on 'Birds of Naivasha Waterside,' they relate that the osprey is resident in Kenya and that there is a possibility of a pair breeding at Lake Sonachi, Naivasha. This information is very interesting as the osprey is regarded as only a regular palaearctic passage migrant and a winter visitor, September to April. Occasionally sub-adult birds do remain in Africa and can be seen in places such as Lake Naivasha. The possibility of osprey breeding here would be a major ornithological event as it is only regularly reported to breed in Africa along the Red Sea coast. Although there have been reports of osprey breeding in South Africa and a 1922 record from Lake Naivasha, none of these have been substantiated.

Osprey, a migrant and winter visitor.

There are several reports of osprey using fish eagle nests as feeding platforms which could easily be mistaken for breeding birds.

I would, therefore, like to appeal to anyone seeing osprey that they think may be breeding to report the fact as soon as possible to the Bird Room, at the National Museum, Nairobi, so that event can be investigated and confirmed.

Dave Richards

Future conservationist

As a regular reader of *Swara* magazine and a member of the East African Wildlife Society through our Wildlife Club, I welcome this chance to sincerely express my gratitude to the Management and the Editorial board of *Swara* magazine for their tireless efforts to publish such a highly esteemed wildlife magazine in the region.

Through reading *Swara,* I have been enlightened on many wildlife and environmental issues and I should say that it's a great inspiration for a person like me who intends to take a career in wildlife after school.

Also, I would like to congratulate a few personalities who have impressed me so much with their articles. These are David Keith Jones, Dave Richards and Jonathan Scott. The quality of *Swara* is very high. Keep up the good spirit. Any information on wildlife from you will be greatly appreciated.

Alice Atieno Oluoch.
Mama Ngina Girls School Mombasa.

I Dreamed of Africa

I am writing to express my disappointment and dismay over the treatment of Kuki Gallmann, author of *I Dreamed of Africa,* in your book review in *Swara* November / December 1991 issue. This thin review damns with faint praise. The reviewer intimates, by tone and wording, that the author appears to be lacking in character, if not downright racist, because her personal view of Africa does not include enough Africans or does not include them by name, early enough in the book. Perhaps the reviewer has missed the point. This makes about as much sense as Christians condemning the Bible just because Jesus doesn't show up until the second half, The New Testament.

But the point is the book presents the *author's* view of Africa; if the reviewer wants us all to have *her* view, she is free to write her own book. It appears totally pointless to lambaste others for having *their* own views. Human endeavors are never perfect, either books or reviews or letters to editors, but compassion and understanding seem lacking in this 'review by innuendo.' We have certainly been given a genuine insight into the reviewer's disposition but I'm afraid it has revealed to us very little about the book in question.

I think that a good book review should offer greater insight into the contents and quality of the book than it does into the attitudes of the reviewer. It should illuminate any flaws without sounding like a personal attack upon the author. Unless, of course, that is the intention. I think one of the great responsibilities of editors is to understand the major difference between criticism and ridicule. The difference is intent.

Kuki Gallmann did not ask to be born into an advantaged life. Any reverse snobbery that looks down its nose on such matters of fate is in total contrast to the actions of those like Kuku Gallmann who are attempting to use their gifts to make the world better. There are numerous people around the planet trying in every way they are able to help East Africa sustain its wildlife and improve the future of its people; I think we all need to be about the business of making friends for our cause. And we need to remind ourselves such friends come in a wide variety of shapes and colors and positions in life.

Richard G. Beyer
Florence, Alabama, USA.

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