1996

An overview of environmental development in the game parks of Kenya

Carolyn G. Ginter

AN OVERVIEW OF ENVIRONMENTAL DEVELOPMENT IN THE GAME PARKS OF KENYA

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Education: Environmental Education

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September 1996

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Approved by:

[redacted]

Darleen Stoner,Ph.D., First Reader Sept 6, 1996
Date

[redacted]

Bonnie Trusler, M.A., Second Reader
Kimbark Elementary School, San Bernardino

ABSTRACT

Kenya has one of the oldest and most developed national park and reserve systems among developing nations in Africa. Kenya' s ecosystems have felt the impact of tourists, from big game hunters to photographic safaris, for over a century. To assess the success and viability of the parks and reserves as impacted by tourists, interviews were conducted with both government officials and interested non-governmental individuals, particularly safari driver/guides. From these interviews the effect of policies on habitat, animal behavior and pollution were assessed. Infrastructure, particularly the dusty, uncomfortable roads, emerged as the main priority for improvement. Increased concern for the environment was evident in the development of less intrusive lodge and tented camp accommodations.

Continued study of animal behavior and habitat destruction may indicate changes for the future. Education of tourists to lessen negative impacts on both animals and habitat needs to continue. Education of Kenyan's about their environmental resources is a priority for the Kenya Wildlife Service which manages the national parks. Kenya has a viable park system which is striving to meet continually changing needs through political and private endeavors.

ACKNOWLEDGEMENTS

I would like to thank the following people for their help, advice, support and constructive criticism: Dr. Darleen Stoner, CSUSB; Bonnie Tressler, Kimbark Elementary; Shaffi Musa, Pollman's Tours & Travel, Kenya; Sam Nduba, Pollman's Tours & Travel, Kenya; Chief Warden Alfred Kizee, Lake Nakuru National Park, Kenya; all the drivers who were gracious enough to answer questions and volunteer information.

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INTRODUCTION

This project contains the research on which the author intends to base a future book about Kenyan ecotourism for the general public. Ecotourism, visiting wilderness and undeveloped habitats as opposed to museums and amusement parks, appeals to many travelers, but few realize their impact on the environment. The future book intends to make ecotourists aware of their responsibilities through information and examples.

During four summers on Kenyan safaris, the author interviewed government personnel, lodge managers and safari driver/guides. These interviews provided a real look at the conservation efforts about which others have written, and helped document the success of current efforts as well as suggest changes for the future. These interviews also provided real life examples of ecotourism effects on the animals and habitats and the resultant policies for the national parks and reserves.

STATEMENT OF NEEDS

Ecotourism is rapidly growing world wide. One country with a long history of ecotourism is Kenya. It has the history and strangeness to be romantic and so entices both the traveler and the armchair traveler. Since people are encouraged to "think globally, and act locally," reading about Kenya's problems and solutions can give the readers a vicarious adventure while also informing them of some conservation problems that are mirrored in their own habitat.

The problems of animal and human contact are really not that different whether the animal is a cheetah being harassed by tourist vans or a cougar whose territory is invaded by a housing development. The destruction of habitat by off road driving in Samburu National Reserve has a parallel in off road driving in the Mojave.

The ecotourist has a responsibility whether he is actually traveling or only reading about a place to which he would like to travel. This responsibility is to know about the impact he has as a tourist. For example the actual traveler should know not to try to approach too close to the African animal, and the armchair traveler should apply that knowledge the next time he is in a similar situation, even if it is feeding squirrels in a park. An increased understanding of the animals, the habitat, the officials in charge, the problems and possible solutions will hopefully make the ecotourist a better world citizen as well as a responsible ecotourist.

SIGNIFICANCE OF THE PROJECT

Ecotourism is the fastest growing segment of the tourist industry. However, many ecotourists do not realize before they venture into the new region that there is more to being an ecotourist than riding around looking at relatively undeveloped terrain. An understanding of the various components that maintain the forest, or jungle or desert or savanna and their unique habitats makes the trip more meaningful for the traveler and ultimately benefits all habitats. This learning acquired from reading about the conservation and tourist impact in Kenya is intended to provide information, in a non-scientific manner, that will transfer to other ecotourist venues.

Of the many books and articles written about Kenya none of them provide a comprehensive look at the impact of ecotourism and conservation on the environment.

Some of the books concentrate on specific species of animals such as Cynthia Moss's Elephant Memories (1988). It is a excellent book if one really likes elephants or is only interested in Amboseli National Park. George Adamson wrote My Pride and Joy (1986) primarily about the years he spent introducing zoo and pet lions into the wild. There are other books such as The Safari Companion (1993) by Dr. R.D. Estes, which covered more than one animal. Estes included the behavior of all East African mammals, but left out their impact and dependence on vegetation.

Some of the available literature has been written by native Kenyan's. Here again an extremely narrow focus has been taken. For example, D. M. Nyeki in Wildlife Conservation and Tourism in Kenya (1992) outlined government policy for game parks and outreach programs. However, this author found it to be biased and so full of facts that while it makes a good reference book, it is not a "good read."

The most comprehensive books are actually the books published by various "guide" book publishers, such as Spectrum and Insight. They say little about conservation but do a reasonably good job of explaining what the ecotourist is likely to encounter. The Rough Guides, Australian publications primarily for back packers do a little more to encourage the ecotourist to be responsible.

Since the books in print tend to deal with specific aspects of Kenya's environment, this project was created to present, in layman's terms, an overview of the various historical and modern concepts embraced by ecotourism in Kenya. Kenya has a long history of ecotourism, and has over the years developed organizations and methods of dealing with tourists who first wanted to shoot the animals and now want to photograph the animal that are left. National parks and national reserves were established to preseve the animal heritage. It than became necessary to create the Kenya Wildlife Service (KWS) to oversee the management of these restricted areas. KWS is responsible for both policy decisions and day-to-day

management of the parks. It also is involved in conservation education and outreach programs.

This author conducted interviews with KWS education officers and park wardens. Interviewing KWS personnel in 1994 and 1995, both at the central office and in the field, provided information on what was being attempted and what had, so far, been successful from a KWS viewpoint.

County councils, appointed by the the central government to manage the reserves, have significant responsibilities. On paper their involvment is similiar to that of KWS in the parks, but interviews cast a different interpretation on their accomplishments.

Tour drivers were interviewed to provide a non-governmental interpretation of the success of KWS and county council efforts. Not all drivers wished to be identified, or some only by their first name. Kenya has not had truly free speech in the past, which inhibited identification if not the expression of opinions.

DESIGN OF PROJECT

Although there is a substantial amount of writing on the environment and conservation in Kenya, almost all has a very narrow scope (see suggested reading list). The few safari guides that are more comprehensive are also more superficial in their treatment of environmental concerns. After reading the available material it was evident that more complete information could only be obtained by interviewing Kenyan government personnel in charge of the park and reserve environments. As government employees, the Kenya Wildlife Service personnel and the county council wardens, could be expected to promote their respective government policies. To provide a balance of perspective, as many drivers as possible were interviewed in August of 1994 and 1995. Particularly in 1994, it was difficult to get comments from the drivers on any aspect of the parks except the roads. Drivers who did not want to be identified are listed by their company and first name only.

Pollman's Tours and Travel: Shaffi Musa, James Kisaka, Raffi Juma Shabani, Saif Muhammed, Leonard, Julius, James

United Touring Company: John Ngugi

Kenya Wildlife Trails: John Nyamache, Charles, Wilson, Ali, David

Intrepids: James KoilekenKemit, John, Carl, Joseph, James

Independent: Jim Mungi

Patrick Pape Camping Safaris: Patrick Pape, John Wanda, Adi Mungi, Muhamed Muhamed, Cedric Crispin, James Sesse

Sekenani: Milton Sulieman, Nick English, Gabriel, Jackson

Lake Nakuru Lodge: Ibrahim Karanja, Joseph Muya, Stephen

Chapter 1

ECOTOURISM IN KENYA

Ecotourism is a new and rapidly growing segment of the tourist industry. Ecotourism may be defined as "purposeful travel that creates an understanding of cultural and natural history, while safeguarding the integrity of the ecosystem and producing economic benefits that encourage conservation" (Whelan, 1991, p. 164). For many nations ecotourism is a new enterprise which the nations hope will prevent or at least postpone the degradation of their native environments and perhaps even relieve the poverty of their indigenous people. For Kenya, however, ecotourism is over 100 years old.

One of the first American ecotourists to popularize the Kenya safari, (journey in Kiswahili), was former president Teddy Roosevelt, who shot many animals to be mounted for public display in the United States. At the time this was probably the only way most Americans would be able to see a giraffe, leopard, or rhino. Never would it have crossed Roosevelt's mind that within 100 years Americans would be able to see all the incredible creatures of the African savannas and jungle on film in natural color and action. In addition, many Americans now have the opportunity to follow in Roosevelt's footsteps, metaphorically, as air transportation has become a major means of long distance transportation and is affordable for the average American willing to pay $3,000.00 and up

for a package air and safari tour. It is not just Americans; even greater numbers of people from Europe and Asia go on safaris.

The impact of 800,000 tourists a year in Kenya, as of 1992, on a nation approximately the size of Texas, is enormous. The number of tourists visiting Kenya is expected to reach one million per year before the turn of the century. Tourism is Kenya's single most important source of foreign exchange currency, and is the nation's second largest industry. To feed and care for the visitors requires 100,000 jobs directly involved with the tourists--drivers, cooks, waiters, tourism agents, house keeping staff, guards, grounds men, laundry staff, mechanics, dishwashers, rangers, wardens, managers, and on and on. Kenya's current number one industry, agriculture, indirectly benefits from feeding the tourists. Tourism also provides 200,000 jobs in the production and selling of handicrafts to tourists (Nyeki, 1992, p. 23).

Roosevelt's safari was a rather leisurely affair, at least for him, as he rode or walked from one hunting area to another. If his mules and bearers tramped on fragile plants the plants would have time to recover because it was unlikely anyone else would trample the same plants for months or years. The animals Roosevelt shot, whether for science, sport, or food, were unlikely to be missed in the plethora of game which abounded in East Africa.

Unlike Roosevelt, today's tourist may have a leisurely safari in that he doesn't have to do much besides ride in a van, eat, sleep, and snap pictures. But where the vans are driven there is bare dirt or

gravel roads. A seed on the road surface would be ground to dust by the safari vans before it could take root. Wildlife, which draws the tourists, is plentiful only in restricted areas and sometimes there the animals are not safe due to poaching.

Kenya, with its experience with everything from indigenous conservation practices, to the romantic era of the great white hunter, to today's package photo safari, is a good place to observe what management practices are effective and which are not. Kenya has primarily three types of wildlife sanctuaries--national parks, national reserves and private wildlife ranches. National Parks officially limit human use to tourism and research, and are managed by the Kenya Wildlife Service, usually referred to as KWS. National Reserves allow some habitation and grazing use by the local indigenous population. The reserves are managed by local county councils although they may take advantage of KWS services and training. Of course, the councils have to follow the laws pertaining to wildlife and tourist management. Private game sanctuaries are businesses that blend livestock ranching with wildlife, although predators are not encouraged since lions, leopards and hyenas will attack cattle and sheep as well as their traditional prey. These private enterprises may also cater to the tourists, providing accommodations and a close look at the less dangerous animals.

Each of these political or business entities is influenced by non-Kenyan governmental organizations, such as the United Nations and its environmental activities, World Wildlife Fund, African Fund

for Endangered Wildlife and others, all of whom have their own agenda and can make themselves heard through their financial support. There are also many scientists in the field supported by universities and grants. The knowledge of these experts provided by the various interested organizations is valuable and if possible is worked into the management program.

The history of environmentalism in Kenya chronicles the changing attitudes of both the native population and the white colonists toward wildlife and habitat. This has affected environmental policies toward local people as well as plants and animals (Nyeki, 1992, p.3). Specific areas of policy implementation concern tourist accommodation, soil and habitat protection and use, the roads to and in the parks and reserves, concerns of indigenous people and the effect of tourism on animal behavior.

With all these concerned governmental and non-governmental groups favoring their own programs and visions, another source of information is needed to a provide balanced perspective. Safari drivers, committed to none of the above organizations, have daily contact with the tourists and with the parks and reserves. The drivers' livelihoods are to a great extent determined by the management practices of KWS and the county councils. The drivers' observations and opinions provide insight on the effectiveness of the policies.

Chapter 2

CONSERVATION PRACTICES IN KENYA

In the 1920s Martin Johnson, the wildlife photographer, wrote, "...I want to live at peace with the animals, for I have the ambition to make a picture record of the animals of Africa that will show the life of each species from birth to death. There are not many years left making such a record: civilization is creeping into British East Africa. In another generation, perhaps, the animals of Africa, the little, beautiful animals of the plains and the strange gigantic animals, the last survivors of the age of mammoths, will be all but extinct...." (Johnson, 1941, p. 169).

Conservation was practiced in Africa long before Europeans, particularly the British, moved into East Africa. But it was the Europeans who first promoted the idea of game reserves and national parks. In 1897 the greater part of the Laikipia plateau in Kenya was designated a game reserve, but the protection was later swept away with the need for more agricultural land. Then in 1909 two large reserves, one in the northern part of the country and one in the south, were set aside as areas where no hunting was allowed except by indigenous people. In other areas game reserves were proclaimed to remove people from spots, such as Ruma National Park near Lake Victoria, where the tetse fly infests the area with sleeping sickness but does not bother the roan and sable antelope which are protected there (Camerpix, 1993 p. 260).

Although the idea of national parks was publicly supported in the 1920s and 1930s, the idea did not become reality until after World War II. Nairobi National Park became Kenya's first national park in 1946 and was regularly followed with others, especially after independence. Today the national parks of the former British East Africa countries make up a greater proportion of their nations than do national parks in Europe or the United States (Camerpix, 1993, p. 261).

When Nairobi National Park was established, it was too late to avert the habitat damage done by World War II military training and artillary practice, but the park still has a forest in the west, a riverine forest in the south, and plains with scattered bush and rocky gorges to the north and east. There are also water habitats around constructed dams. The nature trail along the Athi river in the south is a pleasant change for the tourist tired of being confined in a safari van. Hippos, turtles and monkeys can be seen in the water and along the trail. An armed guard is posted at the trail head, and one of them may accompany vistors as a guide.

At the entrance to the park are new buildings which house KWS offices, and the information and education center. Across the driveway from these buildings is the animal orphanage, established in 1963 to care for young animals without mothers; it also provides medical services for wounded or injured animals. A few animals, such as a tiger, are not indigenous to East Africa but have been donated by other nations.

There are some animals that have been captive for so long they could not fend for themselves if released in the wild. People often think it is so cute to have a wild animal as a pet, but to alleviate problems, they have the animal declawed or otherwise altered to suit their own preferences. Then when the animal grows too large or becomes a nuisance, it is impossible to successfully return it to the wild.

Although the orphanage is in many ways a zoo, with animals in cages, an effort has been made to give the animals a natural habitat. Grass, bushes, and trees are allowed to grow within cages, although feeding platforms tend to be wooden structures for the benefit of photographers. Pleasing the paying tourists with photo opportunities must be considered a necessity in a poor country where the national budget is strained to help hungry citizens, much less animals.

One of the first stops inside the park, aside from any animals one may see, is the small area set aside to commemorate President Daniel arap Moi's setting fire to 12 tons of poached elephant ivory and rhino horn in 1989. It was intended to send a clear signal that Kenya would not tolerate poaching of its wildlife resources and is dedicated to wildlife preservation. There is a raised brass monument to the event next to the circle of ashes where the ivory was burned.

On a tour of the park it is very easy to forget that one is within a mile or two of the nation's capital. A fence has been erected between the park and the city, although the rest of the park has been left unfenced to allow migration. One is likely to view a lion kill on

one side of the vehicle and a skyscraper on the other or be admiring a cheetah sunning on a rock as a 747 overhead comes in for a landing at Jomo Kenyatta International airport. The land is just as it was before Nairobi was a city, except that there are no longer any elephants because farms on the Athi plains have cut off their migration routes.

Today there is still local resentment toward the national parks that take up good farming land and seem to get more than a fair share of the nation's public service money. However, public awareness of the benefits of national parks is beginning to be evident. Past and present Kenyan governments, after all, have been the continent's most powerful advocates of conservation since the colonial days. Kenya's systems and projects have been copied or modified by the governments of many other African nations.

One of the influences of Kenya on surrounding nations centers on the value of quality over quantity. Smaller parks where animals may be more effectively guarded may have to become the norm. Large areas such as the Maasai Mara may remain feasible only if international money will assist the nation. While Kenya is not a large country, it is number three in Africa when it comes to spending money on conservation.

The National parks and reserves in Kenya and other African nations have kept the animals from becoming extinct, but civilization is still encroaching and human population growth shows little sign of abating. Although birth control can be made available to the people

of developing nations, their traditions may make the idea of smaller families unacceptable (Nyeki, 1992, p. 11). Farming and pastoral cultures, such as the Kikuyu and Masai, equate the status of the parents with the number of their children (Nyeki, 1992, p. 12). This may be particularly important to the women in those societies where they are denied almost any worth other than their ability to produce children. In nations without social security systems, the offspring provide the only old age insurance available and so the more children, the more likely enough will live to maturity and provide for the parents when the parents are too old to provide for themselves.

Some of the older traditions encouraged four to six years between children in a family, and considered it improper for a woman of grandmother age to have infant children of her own (Nyeki, 1992, p.12). These traditions became unnecessary when modern technology was introduced and saved so many of the infants and extended the life of the elderly. Instead of trying to totally re-educate people, perhaps it would be better to try to work within the traditional cultural framework and make those traditions function for today's world.

Traditional birth control is not the only tradition that has, at least until recently, been overlooked. Trying to explain to nomadic pastoralists that they can't graze their livestock in a certain area because it has been designated a national park can be an uphill battle. Some of the tribes cross national boundaries in their seasonal

travels and don't even recognize the national boundaries, much less a park boundary.

However most natives understand, and for centuries have practiced, conservation of natural resources as places of peace and tranquillity where people can find spiritual refreshment. The difference is that traditional cultures tend to provide the tranquillity of undisturbed nature for deceased ancestors or tribal totems rather than for living people who want to escape the rat race of modern life (Odak, 1991, p. 31).

Historically many tribes have protected small areas of woodland, brush, or savanna from any disturbance. No wood or plant gathering, no hunting, and sometimes no trespassing except by selected leaders are allowed. These areas are considered shrines associated with the tomb of an honored person, or a place to be honored because of an historical event, or a place where rituals, such as rainmaking, are carried out. In a sense, these copses are like churches, or temples since "holy" services or rituals are conducted revering the departed and requesting the ancestors to beneficially influence the situation of the community.

The Abasuba in Western Kenya are located in five areas and each of the five groups has shrines associated with the tribe, the clan and the extended family. In the Rusinga areas near Lake Victoria there are four clans each with their own shrines in addition to the tribal shrines.

The Nundu clan has a shrine to commemorate a war; the

Kamasengere clan has a shrine associated with rainmaking. These shrines have protected the native habitat and the animals that live there in an ecological balance.

An additional conservation aspect is that many of the clans have sacred animals or totems which they are forbidden to kill. The Wagasi clan believe that their founding father turned into a python and if a python should be killed the ancestor would be angry with the clan. In other areas a particular species of tree or bush is held sacred and cutting it is forbidden. This preserves some of the indigenous flora and fauna areas which have become "...bushy and forested areas alternating with farms and pasture lands in a desirable state" (Odak, 1991, p. 30).

A unresearched idea would be to assess the feasibility of connecting these native shrines with wildlife corridors. At one time, conservationists were concerned with preserving wildlife routes from Lake Victoria to Ethiopia. Subsequent political carnage during the Idi Amin regime in Uganda killed so much wildlife, especially elephants which require large areas to roam, that corridors were no longer needed. The predominately Somali and Sudanese poaching of Kenya's elephants and rhino thinned the pachyderm population so much that it eliminated any need for the animals to travel. It seemed the greater need was to hide.

As the animal populations rebuild there will be a growing need to allow migration in order to keep up the variety in the gene pool and regeneration of the vegetation upon which the animals feed.

Today if large animals try to migrate they will most likely be shot. (One can hardly blame the farmer for trying to protect his crops, nor the sportsman who has paid thousands of dollars for a license to bag his tusker.) The larger animals tend to follow the same trails year after year, so a relatively narrow right of way might be successful.

In some areas, as between the Aberdares and Mt. Kenya, even a narrow path would be incredibly expensive since it cuts through some of the nation's best agricultural areas. There is a grassroots movement to establish corridors as migratory routes between the two mountain ranges (P. Pape, personal communication, Aug. 13, 1994). However, since the Kikuyu who generally inhabit the area make shrines of trees, linking "sacred groves" with wildlife corridors might be a possible way to serve the interests of native culture and conservation, create biodiversity, increase gene pools, open up new tourist attractions and save money. Animals will exploit a new environment given time and opportunity. The shrines already have preserved indigenous plant and animal species; therefore they should be attractive lures for migrating animals. Adding relatively narrow corridors from shrine to shrine seems more achievable than starting from scratch.

Not all conservationists are in favor of establishing migratory corridors. Nick Georgiadis, director of the Smithsonian's Mpala Research Center, maintains that not enough knowledge is available about the different species to warrant setting up routes at this time. His research on the genetic DNA of elephants indicateo that forest

and savanna elephants do not have the same requirements, and so unless one knows which elephants one is dealing with migratory routes will not succeed. He cited the non-use of the Amboseli to Mt. Kilimanjaro migratory corridor as proof (Stewart, 1996, p. 104).

Cynthia Moss, who has studied the Amboseli elephants for over 13 years, recorded migrations from Mt. Kilimanjaro to Amboseli even before the official migratory route was established (Moss, 1988, p. 55). Several recent factors may have made the corridor unsuccessful at this time. The Mt. Kilimanjaro elephants do not necessarily come to Amboseli every year. Their arrival seems to depend on circumstances in their Mt. Kilimanjaro habitat; if nothing occurs to force them out, they stay on the mountain. The other factor is that once elephants wander out of Amboseli and Kenya, they are subject to being shot by big game hunters because Tanzania wants the revenue from the hunting licenses. Neither of these factors seem to have much to do with whether or not an elephant has the DNA of a forest elephant or a savanna elephant.

Certainly DNA studies as well as others provide valuable information on which to base decisions, but the results of those studies need years for accumulation and interpretation, and the problems are here now. Why are there all these problems now? Why weren't they there before? Once again the answer is people (Nyeki, 1992, p. 24). In the past with fewer people, parks could be large enough to encompass all the vegetative requirements for large numbers of elephants or the migratory routes of anything short of the

wildebeest. Now people are farming much of that land and are understandably upset about moving off, a displeasure they are sure to evidence when they vote.

So however much it may dismay the conservationist, large parks, with the exception of the Serengetti-Mara ecosystem are probably on their way to annihilation. Smaller parks that can be more effectively managed are the future. But that too presents its problems. "Once intensive management is started there is no looking back" (Moss, 1992, p. 272).

When an area is set aside even without fences or ditches demarcating the boundaries, it is changed. What is to be the use of the area? Is it to preserve the flora and fauna in a time capsule? Are nature's changing cycles to be allowed to be played out without further management by humans? Should tourism be the prime goal, or perhaps scientific research? The ideas incorporate everything from "preservation to consumptive utilization, and the methods employed range from hands-off nonintervention (the so-called laissez-faire approach) to intensive management" (Moss, 1992, p. 267).

Fortunately ecosystems show a resilience to recover after most human disturbances. Scientist are just beginning to piece together an understanding of these "complex collections of interacting organisms shaped under the forces of natural selection" (Moss, 1992, p. 267). Since Africa has such a variety and abundance of large animals existing in much of the world's last wilderness, those "complex collections" are particularly important.

Until recently one factor that has been left out of the equation has been the pastoralists (livestock herders). They should be included since for over 2,000 years they have been living in harmony with their ecosystems. Lord Delamere, in the early part of the 20th century, was unsuccessful with his farming efforts in the Great Rift Valley, despite fortunes invested in livestock and medicines, until the Maasai herdsmen assisted him. Their input was crucial to the development of Lord Delamere's cattle and dairy herds and by extension to the other white settlers of the area and to the Kenyans who now farm those areas. Their knowledge extends to sheep and goats also (Eu, 1989, p. 45). There are many cultural traditions among the Maasai that are offensive to westerners (cleanliness and the role of women to name only two), but to leave them out of the current ecosystem would be a mistake. To include the Maasai's pastoral knowledge in solving the conservation problems would be more beneficial than to leave them selling beads by the roadside.

Scientists talk about all that can still be discovered. "I very strongly believe that the goal of conservation should be to strive to maintain some areas where ecological processes can continue with the minimum possible influence by man. We still have so much to learn from these processes...I think it is a moral necessity to conserve natural ecosystems wherever possible" (Moss, 1992, p. 273).

However, scientists are human too. "... I have realized that more than anything else, more than scientific discoveries or acceptance, what I care about and what I will fight for is the

conservation for as long as possible, not of just a certain number of elephants, but of the whole way of life of elephants" (Moss, 1992, p. 278).

Mark Carwardine, a scientist who has studied endangered species believes that only one reason for caring is necessary: "..it is simply this: the world would be a poorer, darker, lonelier place without them" (Adams & Carwardine, 1990, p. 213).

Chapter 3

KENYA WILDLIFE SERVICE

The government organization overseeing all these parks and reserves is the Kenya Wildlife Service. KWS is a state corporation, responsible for conserving the Kenyan natural environment and the flora and fauna, utilizing the wildlife resources sustainably for economic development and for protecting the people and their property from damage by wildlife (Nyeki, 1992. p. 6).

It can not be an easy task combining its five stated aims of public recreation, preservation of plant and animal communities, scientific studies, protection of water-catchment and/or scenic areas, and economic gain. Most tourists visit the national parks or reserves which are areas where these five aims have been combined. There are other game sanctuaries where specific threatened plant or animal species are protected, such as the Kakamega Forest for the last remnant rainforest in Kenya, and Saiwa Swamp for the sitatunga antelope. These areas are less accessible to the tourist.

One of the duties of KWS park personnel is to conduct animal census projects. Although resembling a human census, the problem is complicated by the fact that instead of residences, animals have large home ranges which may vary from season to season. So an approximation is arrived at by taking sample counts on foot, by vehicle and from light aircraft. The formula for determining the number of animals from a sample, is P= AZ/2YZ. P=population, A=

total area, Z= number of animals flushed (driven out of cover and observed), Y = average flushing from cover distance, X = length of strip of land where animals are being counted for the sample.

Elephant, rhino, zebra, wildebeest, lion, cheetah, leopard and hyena are the animals most frequently counted. Because of their size, these are the easiest to count accurately; they are also the animals that have the greatest observable effect on their environment, and are most obviously affected by changes in the environment. How frequently even these large animals can be counted depends more on human availability for the count rather on the need to know about the animals.

KWS does not have unlimited funds and so can conduct a park census only when transport and personnel are available and not going to be needed elsewhere. Management policies affect the frequency of census as well as the availability of personnel and equipment. A census is taken when there is a need to update records of any changes among the animal population.

Scientific management practices also involve translocating animals for their protection, such as the rhinos that have been introduced to Lake Nakuru National Park to protect them from poaching. Lake Nakuru National Park is the only park that is completely fenced, and by 1995 had 19 white rhino and 36 black rhino.

Elsewhere, management practices may mean providing waterholes and salt licks. The Ark lodge in the Aberdares National

Park has replenished over 45 tons of mineral rich soil in the area in front of the lodge and around the waterhole. This not only assures that tourists will see the animals, it also gives the animals a protected source of salts and lessens their inclination to wander out of the park in search of new mineral sources.

Controlled burning is a management practice that sometimes causes consternation among the tourists. As destructive as it may seem at first, after the next rain the new green and nutritious grasses will emerge and the game will return (Nyeki, 1992, p. 43). These fires are not the all engulfing conflagrations whipped by high velocity winds so often depicted on film and experienced in Southern California foothills and canyons. Most animals have time to burrow deep or flee the path of the fire without getting singed or scorched. Although the smoke may be unpleasant, roads and other firebreaks help keep the fires in check.

A perplexing, but not uncommon sight, is to see one side of the road untouched by fire but devoid of animals. However on the other side of the road, charred black with no sign of green, zebra, wildebeest, topi, and gazelles may all be contentedly resting on the charcoal remnants of the pasture while watching the tourist vans go by.

One of the most difficult management practices for most people to accept is the culling or cropping of herds. Culling means destroying whole groups of animals to reduce the number to what the environment can sustain. Cropping is removing certain selected

individuals, possibly by big game hunters who pay enormous sums of money for a license to engage in the sport. This money is supposed to be used by the local people who have to live with the animals, thereby getting the locals to accept the conservation movement for financial reasons.

In an area where any hunting is allowed, the opportunities for photography by tourists may diminish as the wildlife becomes increasingly wary of humans. A possible solution would be to require the hunters to use some type of non-vehicular transport, saving the vans and landrovers for the tourists. That might also give the animals more of a sporting chance, as would limiting the type of arsenal usable by hunters. Stalking on foot until close enough to the animal to shoot seems more like sport than hiding in a tree until an animal comes so close the hunter couldn't possibly miss. Kenya has so far resisted allowing sport hunting, although neighboring nations permit hunting because the huge license fees bring in money to countries that have not built up an ecotourism business.

Much of the controversy has raged around killing elephants. Elephants are capable of destroying the ecology of any area in a short time. If there is a famine, for instance, the elephants will tear down trees for food. In the past this has made little difference because the elephants subsequently moved on to other areas and the ransacked environment had a chance to recover before the elephants returned. Today the elephants have nowhere to go and with no predators except humans, they can overpopulate and completely

change the environment of an area in a few generations. Forests are turned into dustbowls this way.

One of the arguments for culling, that is destroying a whole family of elephants, has been that the elephants have such close family ties that the death of family members causes extreme stress for the remaining members. But haven't elephants always died? Even before management practices began, some elephants did not survive to adulthood, some died of accidents, and the rest died of old age. Through all the years of natural deaths, the remaining elephants survived and even thrived. Elephants seem to mourn and have respect for their dead but they also get over their grief and continue to do typically elephant activities, such as take dust baths, eat 350 lbs a day, and socialize with other elephant groups, which are signs of being able to handle stress.

Culling wipes out an entire gene pool and this seems to be counter productive at a time when elephant herds are becoming increasingly isolated (Moss, 1988, p. 269). Those genes may be needed for management in the future in order to avoid inbreeding. While both the translocating and artificial insemination of elephants to increase the gene pool in the wild presently present some interesting problems, new methods in the future may solve those problems. It's always a good idea to keep the options open.

One of the advantages of cropping is that by selectively killing some animals, others may be selectively saved. This does require close observation to know which are to be saved. Elephants have a

matriarchal societal structure and, when the older females are killed, they may not have had time to pass on their knowledge to the new leader. Even the knowledge of who's who in the extended family/clan system may be lost. The new matriarch needs the old matriarch's experience to learn where to find alternate foraging areas, where to find waterholes in time of drought, and where to use their tusks to dig for water.

The elephant population problem also has a "let nature take its course" contingent which maintains that neither culling nor cropping is necessary. This belief maintains that left alone, the elephant population will diminish in accord with the available food and everything will balance out in the end (Moss, 1988, p. 269). It probably would. Unfortunately the balance may be a long way off and in the meantime the human population needs the tourist dollars, or wants to farm the savanna the elephants periodically create from the former forest. So nature may never have a chance to find a natural balance and a whole ecosystem could be lost.

The management of tourists may be more important than the management of animals. It is interesting to note that D.M. Nyeki (1992, pp. 41-45) devoted three pages to all types of wildlife management compared to four pages of park regulations for humans alone. Many of the regulations are no different than those in U.S. national parks. Some rules concern litter and human waste control, camping and campfire safety, and punishments for removing natural objects from the park. Since this area has been scientifically

pinpointed as where man originated, the admonition to leave fossils, bones and skulls *in situ* is especially important.

The possible areas of misconduct of humans are interesting for their variety and ignorance. While the average Western city dweller might not realize the danger from crocodiles when drawing water from a river (they ought to realize the danger of drinking the water), surely they could figure out that swimming in a river is just offering crocodiles fresh bait. The same idea applies to jogging in parks that contain lions, leopards, and cheetahs. They are cats, and cats like to chase things.

KWS generally limits souvenir vending to shops in the various lodges which protects the tourist from continual harassment, but has no control over the area where vans and tourists wait while the drivers pay the entrance fees.

Those entrance fees are considerable. In 1995, a non-resident paid US $20.00 per person per day, plus a $3.00 for the vehicle and $2.00 for the resident driver. That is in addition to the roughly US $100 per day on average for half of a shared twin accommodation (including meals) at a lodge or tented camp. Since opportunity for economic gain is one of the stated aims of the KWS along with conservation and management of wildlife and wild lands, opportunities for public recreation, preservation of plant and animal communities, scientific studies and protection of water-catchment areas and/or scenic areas, the imposition and collection of fees is well within their purview.

Some of the money thus collected is used to acquire more land for national parks, and develop physical structures there in. The roads, bridges and landing fields are not just for the convenience of the tourist. Rangers and scientists use the roads to complete their duties and studies, but the roads also serve as fire breaks. When building staff housing, offices and other park structures, KWS policy is to use natural materials such as stone, wood, thatch, in order to blend in with the natural surroundings.

Creating dams and pipelines for water is another KWS job. This applies not just to areas that do not have an adequate year round supply of water but to distribute the availability of water in other areas. Concentrations of animals at natural water supplies tend to create erosion. This happens not only in fenced parks such as Lake Nakuru National Park but also in large unfenced but arid areas such as Tsavo National Park where the concentrations of animals at a few water holes compacts the earth making it less absorbent as well as depressing trails and overtaxing the vegetation.

Salt licks are another necessity for healthy herbivore herds, and carnivores get their minerals from eating the herbivores. Salt licks, such as the one at The Ark in Aberdares National Park where the 45 tons of mineral rich dirt was brought in to replenish the original natural salt lick, bring animals to the tourists for viewing. Both salt licks and water supplies help keep animals within the parks instead of wandering at risk outside the park boundaries.

Modern management practices aim at keeping a balance of nature within each park. The more naturally this can be done, the better for all. For example, predator control involves not just keeping the predators from eating all the game animals but also using predators to keep the herbivore populations in balance. When the waterbuck population grew too large for Lake Nakuru Park in 1990, KWS trapped and translocated three lions which took care of the problem (A. Kizee, personal communication August 21, 1994).

Another use of the fees collected is education. An impressive new education facility is located at the entrance to Nairobi National Park and therefore well within the day trip limits of the one and a half million people living in Nairobi. But it is visited mostly by foreigners.

Mr. James Muthamia, Warden, Education of KWS, stated that "Man is the number one animal, so he has to look after the other animals." Mr. Muthamia's area of concentration is providing for the environmental education of school groups, such as the Wildlife Clubs of Kenya. "The grown-ups," he said, "have gotten their information piece meal and so don't understand conservation from an historical perspective. They don't even know the names of common birds and plants around their homes, but their grandparents knew. Now they don't know a sheep from a goat, but they know the make of that car" (J. Muthamia, personal communication, August 21,1995).

The Wildlife Clubs are now in 75% of Kenya's secondary schools. They were started in the 1968-69 school year and many of

the first student members are now teachers. Although the schools need more conservation activity materials, the club members give community demonstrations on water, air and ground pollution, and present plays and talks on conservation. *Dik Dik*, a booklet, about the club and its efforts, is published quarterly. The Wildlife Clubs also hold an annual festival during which Mr. Muthamia said they "assist to tidy the national parks."

One of the problems facing KWS Education and the Wildlife Clubs, and indeed conservation efforts everywhere, is the time involved in undoing the damage from the past. When a forest has been clear cut it takes a long time for new trees to grow to the size of the ones lost. But the clubs, with the help of the Ministry of Forestry and donations from companies and businesses, have created nurseries in which the youth club members germinate seeds and then sell the saplings for planting in the rainy season. The current administration encourages people to fill in gullies and then plant the trees to discourage erosion.

This tree planting has created some benefits that people can see and experience. Kenya, however, has porous volcanic soil that rather readily absorbs pollutants from insecticides, manufacturing and sewage (J. Muthamia, personal communication, August 21, 1995). "To remove these unseen pollutants, takes time. People can not imagine." said Mr. Muthamia (J. Muthamia, personal communication, August 21, 1995).

Never-the-less, KWS encourages Kenyans to make compost from kitchen and table waste to improve the soil's texture and water retention as well as serve as organic fertilizer. Pollution prevention by biological methods is promoted including recipes for making insect deterrent sprays from stinging nettles and garlic. This saves money too. Companion planting, such as planting marigolds between crops to keep pests away, is explained to farmers as part of the KWS outreach program, as is the necessity for protecting bees which will pollinate crops.

Incredible as it may seem with the current emphasis on endangered species and park sanctuaries, 80% of Kenya's wildlife still exists outside of the park boundaries. But then the wildlife is not all the big five (elephant, rhino, Cape buffalo, leopard and lion) and large herds of migrating herbivores. The animals of concern to most farmers are monkeys, baboons, wild pigs, and birds that eat the crops. Despite the birds' destructive abilities, farmers are advised to allow bushes and trees on farms to provide shelter for birds and insects that also pollinate. Leopards are encouraged in surrounding wild areas, if livestock farming is not being pursued, because the cats help control the monkey and baboon population.

Fortunately poaching is not the problem it was during the 1980s. The International Union for the Conservation of Nature and Natural Resources has done much to stop the trade in ivory and horn, as has the Kenyan government. Besides the 1989 burning of $12 million worth of ivory and rhino horn to publicize the fight against

poaching, Kenya had a "shoot on sight" policy towards poachers. Although there is still the occasional poaching of a game animal for food by locals, and honey hunters are infrequently seen in the parks, the wholesale slaughter of animals for tusks or horn to be exported has been drastically reduced.

Without the need to expend so much time and money on purging poachers, KWS has the opportunity to develop education and outreach programs for its own citizens. Domestic tourism is very limited in Kenya's game parks. Even Nairobi National Park, which abuts the boundaries of Kenya's largest city, has never been visited by the majority of the people living near it (J. Muthamia, personal communication, August 21, 1995). If the people do not experience and understand the value of wildlife to their economy, heritage, and future, they will not preserve it. This really presents two problems: the need for local people to benefit directly from the game parks, and the need for all the population to value what their country has to offer.

To address these needs, the Kenya Wildlife Service has an educational section that appears to be woefully in adequate in finance and supplies. Dedicated personnel can only do so much. James Muthamia, Warden, KWS Education, helps coordinate the various school and Wildlife Clubs of Kenya activities to prevent erosion and reestablish the habitat.

Most of the posters, booklets, and brochures used for school education and community outreach come from non-governmental

organizations which may or may not have their own agenda. KWS displayed only two uninspired posters of its own in the Nairobi headquarters on August 21, 1995.

Possibly outreach programs developed by local park wardens are more productive than those that come from the central government. Both Chief Warden Kizee of Lake Nakuru National Park and Assistant Warden Leaduma of Samburu National Reserve spoke positively of using park/reserve profits to build footbridges for school children, feeder dams on slopes that would otherwise erode, and cattle and sheep dips (A. Kizee, personal communication, August 21, 1994) (W. Leaduma, personal communication, August 3, 1995). The projects to receive money must benefit the community and the park/reserve and be approved by the local council and KWS. Both wardens stressed that more needs to be done in education but that the money is just not there, or is opted for more immediately urgent projects.

With the help of Chief Warden Kizee; Dr. Darleen Stoner, CSUSB; Pam Godsey of the U.S. Forest Service and Pollman's driver Shaffi Musa, I introduced litter bags to tour drivers and park personnel in 1994. The litter bags inspired Chief Warden Kizee to install 12 trash barrels around the park, even though it took nine months to design a barrel that would keep baboons out and litter in. The design involves a barrel that tips with the baboons weight but does not open at the same time.

Chapter 4

SUPPLEMENTAL AND OUTREACH CONSERVATION EFFORTS

The efforts of the Kenya Wildlife Service are supplemented by a plethora of international, national, public and private organizations. There are at least 11 organizations involved in conservation with a international or national scope, including the United Nations Environment Program, with headquarters in a Nairobi suburb, and the East African Wildlife Society. Many other organizations function locally such as Friends of Lake Nakuru and Elementaita. There also more individuals who, like Daphne Sheldrick, rather quietly pursue their own conservation agenda working with others as needed and doing what they can on their own the rest of the time. There are even individuals whose efforts may be little known outside their own scientific field, such as Cynthia Moss, but who continue to do what they can.

One of the earliest efforts to preserve the existing flora and fauna was instigated by indigenous Kenyans of the Wameru tribe in 1959. The Council of the Wameru set aside what is now Meru National Park as a protected area for the wild game that had been nearly wiped out by hunting. The colonial government and later the Kenyan parliament concurred and the herds and their predators have, with time, returned to something close to their original numbers; except for the rhinos (A. Kizee, personal communication, August 21, 1994)s. Meru National Park is where in 1984 a small

herd of closely guarded rhinos, kept in a fenced enclosure, and their guards were all slaughtered by poachers with automatic weapons just for the rhino horns.

Meru National Park encompasses only about 300 sq miles but has common borders with Kora and North Kitui Reserves to the south and Bisanadi and Rahole Reserves on the north and east. In the park itself are four habitats with adequate loop roads for exploring their diversity. A swampy section provides visitors with views of a variety of game, especially large herds of buffalo and bull elephants which prefer the swamps to the plains area where the cow and juvenile elephants gather. This plains section attracts grazers, such as zebra, giraffe, oryx and eland, which in turn attract predators, especially lions. Elephant, buffalo and plains animals are also present in the evergreen bush section. The commiphora bush section combines thorn trees with riverine gallery forests along the Tana River where cheetah, lesser kudu, and gerenuk mingle with the other plains game and their predators. This area is also known for the viewability of hippo and crocodiles in the river.

The Meru and the Kora areas were where Joy and George Adamson carried out much of their work reintroducing lion, cheetah, and leopard to the wild. This publicity, plus the four different habitats, and wealth of wildlife should make Meru a popular national park, but very few tourists visit it. Patrick Pape, Patrick Pape Safaris, and a few other safari operators take mobile safaris there. One lodge and a self-help camp, as well as several tent camp sites,

are available, but few standard safari routes include Meru. In the past the possibility of poachers may have deterred companies from including Meru, but now that there are no more rhino to lure the poachers it could be included instead of one of the more crowded parks.

For those Kenyans who are willing, KWS encourages them to organize in order to take advantage of conservation tours and presentations, to protest to authorities about forest clearing or pollution, to plant trees, and to join conservation organizations. Perhaps the most surprising admonition is to visit the National Parks and Reserves, not only to support conservation and wildlife, but for the Kenyan's own enjoyment. This last suggestion is made easier for Kenyan nationals since their entrance fees are only 10% of the fees for international tourists. Many lodges offer Kenyans lower rates, although this is far more prevalent during the rainy seasons.

Some business enterprises also support conservation. The Serena Hotel chain prides itself on its environmental awareness. Their rooms come complete with a "Code of Conduct" pamphlet from the Friends of Conservation (FOC), which is printed by British Airways. Conduct on safari, on the beach, with local people and while shopping is covered. In general the FOC pamphlet says when in doubt ask the guide or hotel staff or else don't do it. This particularly applies to women's dress in Muslim areas, and making undue noise anywhere. It also admonishes against the mutually degrading action of throwing candy out the van windows to children.

It is humiliating to everyone. Children being children, especially rather poor children, they will flock to the candy but what is one seeing? This is certainly not normal behavior on the part of the children nor, hopefully, the visitor.

The section on shopping reminds the traveler that all trade in elephant, sea turtle, chimpanzee and gorilla products are internationally banned. Cat furs are almost totally banned. Any of these products one does buy will be confiscated on arrival by customs officials in one's home country. Instead of purchasing souvenirs of over-harvested marine shells, coral and fish, cotton goods, wood carvings and bead work are suggested. The clever beads made from old magazines are an exceptionally environmentally correct souvenir. Besides providing their clients with FOC pamphlets, the Serena Chain has instigated the tree planting operation in Amboseli National Park and takes an interest in the environment wherever it has established lodges. Even in the city, preserving nature is important. The Nairobi Serena, designated one of "The Leading Hotels of the World," and acclaimed by many as the best hotel in Nairobi, has incorporated into its design a glorified frog pond. A raised outdoor area behind the glass enclosed lobby has been given a small stream, lots of jungle-like plants and some vociferous but invisible frogs. This is, however, entirely appropriate since the city of Nairobi was built on a former swamp.

The swamp used to start right in front of the Norfolk Hotel, the city's oldest hotel and another "Leading Hotel of the World." The

former swamp now contains a parking lot, the Kenya Broadcasting Corporation and part of the University of Nairobi. The Norfolk has not attempted to preserve the swamp, but they do provide a look at various Kenyan wildfowl confined in cages. Of particular interest is the cage containing vividly colored Turacos. These birds are found in places like the Kakamega Forest which are not on the usual tourist safari. Pink and green doves have been displayed as well as guinea fowl and mousebirds. Not all the birds are caged. Large birds of prey roost in the enormous old trees in the courtyard but none of the staff seem to care; they just accept the birds as a frequent visitors.

Most of the trees in Nairobi itself are not indigenous. When an Assistant Commissioner, John Ainsworth, wanted to improve the appearance of Nairobi after the arrival of the railroad he decided to plant the trees that line the cities major thoroughfares. Uhuru (Freedom) Highway and Jomo Kenyatta Avenue are still lined with those trees, most of which were imported because no one knew much about Kenya's flora at that time. The eucalyptus trees came from Australia and the bougainvillea that not only climbs walls but is also trimmed into bushes was imported originally from South America (Eu, 1989, p.105).

A half days drive north of Nairobi, the Mt. Kenya Safari Club runs an animal orphanage which many locals disparage as only functioning as a zoo and not doing enough to return animals to the wild. Despite the non-African ambiance the orphanage provides the tourist a chance to observe some animals on practically an eye to eye

basis. Visitors may feed the llamas (imported from South America to be used as pack animals when scaling Mt. Kenya), pet a lesser bush baby (galagos) and watch it "kangaroo" leap back to its enclosure, pet a baby bongo (a rare forest antelope), ride a tortoise, feed a colobus monkey, and meet a bush pig named Henry.

The lesser bush baby is a primate and unlike the greater bush baby it looks somewhat like a kangaroo rat. Greater galagos have lovely uniform length hair all over their bodies and their tail. Both varieties make a crying noise at night that sounds like a human child, hence the name. The fur of the lesser galagos is soft and fine and invites one to pet it. Since it is primarily nocturnal, its eyes are enormous for a creature that comfortably fits in the palm of one's hand. Both galagos are reputed to make splendid pets, although their inherited habit of marking territory by urinating, as frequently as every 20 minutes, might limit their desirability as a house pet. At least one of the Mt. Kenya Safari Club's lesser galagos has been successfully returned to the wild.

The colobus monkeys brought in for health and breeding purposes were kept caged except for two of the younger ones who are friendly and well behaved enough to have the run of the area during the day.

Three times the orphanage has attempted to rehabilitate Henry the bush pig into the wild and three times he has returned. It is hoped that rehabilitating him as one half of a pair of bush pigs will be more successful. An attendant said that it is very irritating to take

Henry to some distant but suitable environment, and a few mornings later find a hole dug under the fence and Henry back in his own bed.

Safari companies, with their vested interest in the continuation of wildlife habitat, have also supported conservation interests. Every company van I have been in has displayed a reminder from Friends of Conservation to follow the advice of the driver, respect the need for animals to have space and not to feed the animals. The drivers themselves will stop to pick up trash, right an over turned trash can, report violations by other drivers and notify game wardens of injured animals, especially where snares and/or poaching are suspected. These are all individual actions by separate individuals; there is no concerted action by all drivers. While they earn a decent wage by African standards it does not leave much for charitable contributions and they are not encouraged to band together for any purpose since it might lead to formation of a union.

Most of the major safari companies include in their advertisements the list of wildlife conservation organizations that they support with part of one's safari costs. Some companies even give a choice of which organization should receive the contribution.

Some of the smaller independent safari and tour companies lease land from Masai group ranches on which they set up tented camps and take their clients on game drives. This rental income has encouraged the local tribal groups to take better care of their land, including litter control, cattle herding, and avoidance of the more tacky souvenir shops.

Patrick Pape of Patrick Pape Camping Safaris is associated with one of these land lease projects and is quite enthusiastic about its present success and hopes for the future. The Maasai group ranch with which he deals has driven out a too intrusive souvenir vendor and seems to have confined the trinket sellers to the area around the landing strip. Several Maasai families have erected rickety fences as stalls to display their bead work, etc. at the end of the runway. This is not an airport--only a runway, where a jeep is still driven up and down the tarmac before an expected flight to scare off any wild animals.

Patrick and others in the lease association, the directors of which include Maasai and safari camp owners, have worked together to fight "city hall," assist with scientific studies, and provide jobs for Maasai moran (young men who in previous eras would have been warriors). In one dispute with the local county council the group took their case all the way to the Kenyan Supreme Court and won.

The association is taking a great interest in a scientific study by a South African University field team which will help determine the type and extent of land use in the future. Driving off-road has been allowed in this northern part of the Mara, just outside the Maasai Mara National Reserve, but a series of loops with side excursions is being contemplated if the South African team discovers a detrimental impact from the present use system.

Local Maasai villages supply askaris (guards) for the tented camps. These guards are especially needed for wilderness camps

where the facilities are in a separate tent behind one's sleeping tent. The askaris patrol the perimeter at night and in the morning can tell one what was missed, like the two lionesses that came through camp just before dawn.

At Lake Nakuru National Park, Mr. Joseph Muya, Sales and Marketing Manager for Lake Nakuru Lodge, is also Vice-President of the Friends of Lake Nakuru and Elementaita (FOLN) and is actively involved in improving the conservation of Lakes Nakuru and Elementaita. As a FOLN moneymaking activity, guests at Lake Nakuru Lodge are given the opportunity to plant a tree for US $ 5.00. These trees line the safari van parking lot and eventually will provide much needed shade and also help prevent soil erosion. To quote Mr. Muya, "For $5.00 you can then say, 'I have a tree in Africa!'" (J. Muya, personal communication, August 10, 1995). A tree is chosen from those varieties on hand at the time of one's visit, and a wooden sign with the purchaser's name will be planted in front of the tree. All in all, it's a nice idea, especially since the Lake Nakuru Lodge staff does all the hard work, like digging the hole. All the tourist has to do is pose holding the tree over the hole while friends take pictures, and then the tourist can toss in a shovel full of soil and pour in some water as symbols of his good intentions.

Another money raising activity for conservation projects funded by the Friends of Lake Nakuru takes place after dinner at the lodge and it has been very successful. During the day guests may buy raffle tickets at a table set up for that purpose and which also

displays the various prizes that may be won. For a couple of U.S. dollars one can take a chance on winning books and pictures of Lake Nakuru and Kenya. None of them are particularly valuable but the excitement of the staff is infectious and a good time is had by both visitors and staff.

Mr. Muya, along with the Friends of Lake Nakuru who voluntarily help take care of conservation and environmental awareness by protecting the flora and fauna of Lake Nakuru and also nearby Lake Elementaita, now has a new project: raising money to rehabilitate Lake Elementaita and have it gazetted (be officially designated) as a game reserve. Since the company that owns Lake Nakuru Lodge is building three new hotels in the Rift Valley, including one at Lake Elementaita, this project may help to relieve the potential overcrowding at the other Rift Valley game reserves and parks.

Conservation, of course, is not all plants and animals. Human culture needs conservation too, and Lake Nakuru Lodge is aware of this. Periodically local dance troops perform for the guests after dinner. A variety of dances and songs are presented energetically and enthusiastically. It makes for an entertaining evening for the observers and helps to preserve at least a remnant of a previous way of life. During the day local school children on field trips to the national park stop at Lake Nakuru and visit the Lodge.

Lake Nakuru is the only RAMSAR (convention of wetlands of international importance, named for the location of its first meeting

in Ramsar, Iran, 1971) site in Kenya. It is a matter of pride to Lake Nakuru's Chief Warden Kizee that this water catchment area has an obligation to be an example to other wetlands. As a RAMSAR site it must develop a program that encourages conservation of biodiversity with sustainable development and the health and well being of people everywhere (A. Kizee, personal communication, August 10, 1994). Being a water catchment means that the lake and its protectors face special problems. Lake Nakuru is a wetland park located near a town at a low point in a farming district where all the polluted run off accumulates in an area which is designed to attract tourists, many of whom come to see the extravagant birds. If the water becomes too polluted, the birds won't come and neither will many of the tourists.

Because of the importance of the tourist industry in the local economy Chief Warden Kizee sees the necessity of having the whole area contribute to the protection of the catchment, and also sees the need for international help, even if it comes with strings attached. After all, many of the birds that winter in Lake Nakuru summer in Europe, so other countries have a vested interest in preserving this second home for their indigenous birds (A. Kizee, personal communicaton, August 21, 1994).

One of the first goals is to educate the surrounding communities about non-harmful or at least better farming practices. "KWS at Lake Nakuru, with its education center, tries to raise public awareness so that the people will appreciate what a protected area is and to stimulate them to become responsible in terms of

preservation," according to the Chief Warden. "The people don't realize that a change of weather patterns or hydrological cycles can cause disruption of the catchment" (A. Kizee, personal communication August 21, 1994).

Although KWS at Lake Nakuru National Park does have a community bus to bring local people to the park, most of the education consists of KWS personnel going to small groups in small villages and meeting the people at schools or churches. Besides informing the local community of the hazards to the national park due to cutting trees and gathering wood for cooking fires both in and out of the park which creates erosion and habitat loss, the KWS staff tries to assist the local communities through revenue sharing. This revenue may come from park fees but may also include money from national and international organizations. "Projects in the catchment area need the involvement of not only local people and Kenya Wildlife Service, but also the collaboration of other government departments, like the engineers, and other international organizations such as the World Wildlife Fund. All need to form themselves into a forum to work together so that there is no duplication nor misunderstanding," stated Chief Warden Kizee (personal communication, August 21, 1994).

The first step is often targeting a group, and then visiting the group to invite them to the park's education center to meet with other interested parties. The group might be a village, farmers cultivating a certain crop or using methods unfriendly to the habitat,

or a concerned civic club. Whoever attends the meeting, the first goal is prioritize their needs. Their particular need might be better cooking facilities, terracing or building feeder dams to improve drainage, or maybe a bridge for the children going to school. Whatever the need, revenue sharing money can only be used for projects that are good for the environment or possibly another beneficial project if the community has already done something good for the environment.

The reason for local, national, and international involvement can be seen using the firewood for cooking as an example. The local people benefit from revenue sharing by receiving more efficient stoves which saves them time and energy. Nationally the country benefits by saving the habitat which is home to the animals that attract tourist dollars. Internationally everyone is better off with reduced fuel consumption which saves energy and reduces smoke which contributes to the greenhouse effect.

This revenue sharing undertaking began in 1991 and by 1993 results were visible. Plastic waste had been increasing in Lake Nakuru National Park, but as local people began to change their attitude toward the park the results of their concern became evident and plastic decreased (A. Kizee, personal communication, August 10, 1994). To achieve results it is necessary for the local communities to feel that the parks belong and are useful to them. Lake Nakuru is fortunate in this regard. Many Kenyans visit it because the lake is near Nairobi, is part of the Great Rift Valley, is located at a major

crossroads and is famous for its birds which draw return visitors in various seasons. In current American slang, the Kenyans tend to "buy in" to Lake Nakuru National Park. Kenya's current president has a home nearby, as do many other government officials and this factor has had a beneficial effect on the whole area.

Like many other Kenyans in wildlife associated positions, Chief Warden Kizee radiated a camaraderie with the animals he deals with. "Animals probably say, 'What are those strange things?' when they look at people. But the flamingos don't fly off when tourists come to look at them anymore. We can live together" (A. Kizee, personal communication, August 21, 1994). Like drivers, lodge managers, and other KWS personnel the Chief Warden would like to see improved infrastructure, such as improved roads, drainage and facilities. He also would like more advertising to attract tourists both domestic and international. "The park system," he said, "was designed to save for the future, specimens for posterity, so we have to conserve even if people don't go there."

Some environmental projects in Kenya are truly multi-national. Mr. George Small is an American who has worked with Princeton University and the Smithsonian Institution to investigate the environmental problems threatening the dry bush-savanna habitats of sub-Saharan Africa, as well as train Africans who want to be scientists and environmental managers.

The Mpala Research Center, on Mr. Small's 75 square mile Kenyan livestock ranch, began operations in 1994 through the

combined efforts of the Smithsonian and its Tropical Research Institute, Princeton University, Kenya Wildlife Service, the National Museums of Kenya and the Mpala Research Trust. The Washington, DC National Zoo has created training courses; the British Army has built much of the infrastructure; and the Center has been funded by British Airways, Citibank and the United Nations Environmental Program (Stewart, 1996, p. 106).

The ranch and research center are located on the Laikipia Plateau which is about a half-day drive north of Nairobi. This mile high plateau contains several working guest ranch-wildlife sanctuaries, such as Lewa Downs and Sweetwaters. So neither the wild animals nor Mr. Small's 2,500 head of cattle are unusual. What is unusual is the toleration this ranch shows to predators that may at any time decide that they prefer beef steak to buffalo rump. The steak is usually easier to subdue--if the predator can get past the Samburu herdsmen.

Mpala Research Center has one herd of elephant estimated to number 200 family members. This is the second largest herd in Kenya and the largest outside a national park. Primates, big cats, ungulates, ostrich, hippos and snakes abound. The only totally unrepresented species seems to be the rhino which has been poached to extinction in this area. The rest of the living creatures--human, plant, livestock, and wildlife--are a living experiment in coexistence.

Other experiments have a narrower and more traditional scope. One study is on desertifcation (the transformation of adequate habitable land into sub-standard arid land). This study may have ramifications not only for Kenya and East Africa but for many areas in the rest of the world. An inventory of the native plants is being taken, and some areas are fenced as test plots to observe the effect of different combinations of animal life on the vegetation. Animal behavior is studied and DNA testing is done on elephants to determine if they all are the same sub-species and so whether or not the same management practices can be used.

Human behavior is also studied. Locals cut the whistling thorn acacias to make charcoal both for their own use and for export to towns. Does this harm the environment? The plant's name comes from the whistling made when the wind blows across the openings on tree galls which harbor ants. When a giraffe, or other animal, begins eating a whistling thorn branch, the indignant ants run out of the gall and secrete a formic acid on the leaves and twigs that the giraffe finds so tasty. The giraffe does not find the acid secretion appetizing and so quickly moves on to another acacia before eating the ants' home right down to the ground. People, however, tend to knock the ants off and even step on them before cutting the thorn tree down and burning it. Besides cutting down trees and bushes for fuel, native land users have traditionally cleared brush and burned fields in order to plant crops. The far reaching environmental effects of these practices are being studied. These study projects have been

conceived and are being carried out by Kenyans. Someday Mpala hopes to be a magnet for field studies from all over East Africa.

Chapter 5

INSIGHTS INTO ACCOMODATIONS

In 1991 Wildlife Conservation International, in conjunction with governmental and private concerns like the Serena hotel group, met and subsequently published a guide for lodge and camp management in wildlife areas. Planting trees was recommended as was using firewood only for cosmetic fires. A moratorium on lodge developments in the Masai Mara and the increased use of bio-gas (cattle dung and water) for cooking and heating were also suggested. Smaller vehicles were deemed better for the environment than large trucks, and all vehicles were requested to stay one to five meters away from and lion and leopard and possibly 21 meters away from cheetah. Perhaps the greatest value of these recommendations were that they could be implemented by the lodge managers themselves without having to go through governmental red tape (M.S. Madi, personal communication, August 20, 1994).

Many of the older lodges are stucco structures with concrete paths leading to the rooms, dining hall, reception, swimming pool and other public areas. The grounds are planted attractively, but unfortunately planted with introduced species instead of native plants. Some of the lodges, which were built before conservation became popular, look like miniature villages complete with a busy service station, which provides gas and diesel to all the tourist vehicles in the area. Some of these resorts are so populated that

traffic jams and noise pollution are created in the middle of the African bush.

Newer tourist accommodations have generally tried to be less intrusive. In Samburu National Reserve the Samburu Intrepids Club is a permanent tented camp with semi-rustic charm. Native materials, mostly wood, have been used to create a comfortable respite not only from the surrounding desert, but also from urban life.

The dark polished wood reception area is cool and open to any breezes that waft through. Breakfast and lunch are served as outdoor buffets on a tree-shaded deck overlooking the Euaso Nyiro river. Dinner is seated service under cover of a high matuti (thatch) roof. Solid walls and walkways are of native stone. The swimming pool has adequate shade and sun areas surrounded by lovely plantings.

Lining the river bank on each side of the reception areas are tents on raised platforms. These tents are a wonderful surprise. Nicely shaded by trees, they still provide a view of the river from wood decks complete with deck chairs. Inside are two four-poster beds, generous tables which allow room for luggage, as well as writing desks and dressing tables. Each tent has a ceiling fan and adequate lighting for reading or writing.

The attached bathrooms are a bigger surprise. The top is still tent, but below the window screens are native stone walls and floors, and marble double sinks. The large towel rack holds several thick towels and there are even washcloths! Washcloths are a rarity in Africa. While electricity for lighting and shavers is provided, the

generator is off from midnight to 6:00 a.m. Flashlights are provided in each tent.

Overall, the Samburu Intrepids Club has a relatively minimal impact on the environment. Tents on raised platforms do less damage than do concrete slabs and masonry walls. Solar panels are used to heat water. The planted "public" areas have been kept to a minimum, and while there are paths along the river front, they are short and unpaved. There are no sweeping lawns of non-native grass to distract the eye from the natural beauty of the riverine forest (gallery forests on each side of the river). The grounds personnel even sweep up leaves and litter with home made brooms (sticks with twigs tied to the end). This general lack of commercial intrusiveness results in the abundant bird life that may be seen, or at least heard. Since the native bush has been so well preserved it is sometimes difficult to get a good view, or photograph, of what is so cheerfully singing . At other times a long-tailed green malachite sunbird or an orange breasted silverbird may visit the branches only a few feet from ones tent's deck.

Vervet monkeys and baboons may meander through the camp boundaries although they seldom venture into the guest areas to bother tourists by begging, stealing, or otherwise making nuisances of themselves. Slingshots in the hip pockets of the staff and small pebbles positioned on many of the railing posts are used to keep them at bay. Larger animals do come and go around the camp, but are more likely to be heard than seen.

Even less intrusive are the non-permanent tented camps such as those run by Patrick Pape. They are the old fashioned Teddy Roosevelt, Ernest Hemingway type of camp. Tents are on the ground. Propane lanterns and firelight provide the only light at night. The "long drop" toilet is in a separate small tent behind one's sleeping tent. One's shower enclosure, with bucket hanging overhead from a tree limb, is also conveniently placed outside the "back door."

Patrick admitted that it took awhile for the staff to prefect the routine that provides just the right temperature water in the shower bucket on five minutes notice and that a few early clients got a little scalded (P. Pape, personal communication, August 18, 1994). Breakfast and lunch are served under the shade of a tree, and dinner is served in the dining tent. All meals are cooked over an open fire.

The staff likes to give behind the scenes tours on days when they can display the fresh bread baked in a Dutch oven over coals. There is a 55 gal water barrel continually heating water for cooking, cleaning, showers, and washing. A tent with screened sides houses fresh fruits and vegetables which have to be trucked in every week. This screened tent and its contents are a great temptation to baboons. The food preparation area is in a three sided tent with overhang and which contains the larder and a refrigeration unit that runs on propane.

Next to the kitchen area is the laundry area where one's clothes are laundered, dried on ropes strung between trees and then pressed with an old fashioned iron. The top of the iron lifts up and hot coals

are placed inside to heat the metal sole plate. The coals are replaced as the sole plate cools. The laundry staff does a lovely job under these primitive conditions.

Inside the tent are low twin beds separated by a sheep skin throw rug. A hot water bottle is placed between the sheets at night and when Patrick has occasionally forgotten to mention this amenity, guests have experienced some surprises that they eventually find amusing. Behind the bed area is a sort of dressing room containing a table with fruit, a clothes rack and suitcase stand. Those low twin beds seem rather awkward at first, but in the morning they are wonderful. Since these camps are on land leased from the Masai and are outside the park, the 6:30 p.m. to 6:30 a.m. curfew, imposed in national parks to give the animals a respite from people, does not apply. Patrick is able to get his clients out on the plains at first light to see what the animals are doing. This means rising before day break. At about 5:45 a.m. one of the staff arrives outside one's tent, and wishes a good morning and asks if he may bring in tea and biscuits. After receiving a good morning in return, he enters the tent and places the tea tray on the woolly rug. Then all one needs to do is roll over enough to pick up the tea cup without ever having to get out in the cold. By arriving on the plains that early, Patrick's clients are on the plains when the predators are most active. Therefore they are likely to see events that make up for any inconveniences of a bush camp compared to a resort lodge.

In Patrick's camp, tents are arranged in more or less of a semi-circle backed by the gallery forest of a lugga (periodically flowing stream bed). Somewhere in the ravine lives a leopard, which has avoided being seen but can be heard coughing. Baboons sometimes wander through a glade on the far side of the ravine and then through or around camp. Since baboons are such thieves their presence is not encouraged. Somewhere in the branches overhead lives a bush baby. And two lion prides frequently roar on each side of camp. Lions have been known to wander through the camp at night and have shown great interest in the landrovers. Once a small family group of elephants grazed on grass inside the ring of tents. This "living side by side" is not to be found in large, permanent, stucco lodges.

When the grass is not too tall to hide lions or other wildlife, members of the camp staff and the Masai askaris will lead short walking tours. They point out trees that are used for medicine, and toothbrushes, and give a demonstration of building a fire by "drilling" a piece of bark with a stick. They collect a puffy cotton-like substance from a bush to start the fire smoldering before adding dried grass and twigs. They also point out animal tracks and answer questions.

Patrick moves all the tents around the camp from season to season, and after a few years in one location he moves the whole camp to an entirely new area. This gives habitat a chance to recover and prevents the animals from becoming too accustomed to the

presence of non-threatening humans. Wherever he moves he always pays the Masai chief every Friday, in cash.

The renting of land to safari operators has created a cash economy that is something new for the Masai. They resisted it strenuously until rinderpest (a cattle disease) severely diminished their herds of cattle which had always represented wealth to them. They have eased back into a cattle economy to some extent since their herds have recovered, but at the time of the epidemic, money seemed much safer than cattle. To service the new banking needs of the Masai, Barclays Bank sent out vans complete with tellers to local villages. The Masai, some of whom might have the equivalent of U. S. $50,000 to $70,000 in the bank, would bring their whole families into town on Friday and withdraw every last dime. Then the family groups would sit on the curb and count every last dime. When the bank's money coincided with their count the Masai would redeposit the whole amount.

The Masai askaris at Patrick's camp put on a native dance show for clients. After dinner, guests sit around a roaring campfire and out of the darkness comes a primordial yell. After a pause a few more subdued yells follow, and then the huffing sound of lions can be heard. Soon a line of spear-carrying, red-clothed Masai emerge and circle the fire and guests, while their leader sings the songs and the rest chant like lions. As a finale the Masai gather in a semi-circle, still singing and chanting, and demonstrate their trampoline abilities,

those stiff legged jumps that seem to depend on chest and shoulder action as much as leg muscles.

Other lodges, such as the Mara Serena, also have the Masai dancers and there too, the dancers are the staff and their friends from the Masai villages. Patrick's, however, has a setting and atmosphere that can't be duplicated when surrounded by concrete and stucco. Lodges like the Serena do have compensations, such as lovely swimming pools.

Whether the tourist accommodation is a tent in the bush or a motel like lodge, there is the problem of litter. The accommodations are located close to the favorite areas of wild animals, and although litter dropped by tourists is increasing, the rubbish dumps of the lodges and camps contribute the largest amount of dangerous environmental contaminants. Due to proximity to water holes and salt licks the garbage dumps are conveniently located for the wild animals.

Cynthia Moss, who studied Amboseli elephants for years, wrote about the night that the Tuskless family group of elephants began scavenging at two lodge dumps, went on to terrorize some campers, and finished off the night and Moss' kitchen while raiding Moss' camp supplies. (Moss, 1992, p. 152) In 1990 an Amboseli elephant which died of eating tourist lodge garbage, had clothing, polythene, paper and bottle tops in its stomach (Nyeki, 1992, p. 48). These rubbish dumps are buried and fenced, but since animals can still detect the odor they will break in to feast on human food.

Why isn't the trash just hauled away? It is expensive, and already a night's accommodation in a tourist class lodge, including park entry fees and pro-rated portion of driver and van charges runs close to $200 . The lodges do not want to price themselves out of business. Besides to what location are they going to haul it? Unless it can be treated, perhaps composted, it will just contaminate the new dump area.

Chapter 6

ENVIRONMENTAL PROBLEMS THAT AFFECT WILDLIFE

Many tourists forget that the appropriate habitat is essential for the survival of the animals. This habitat includes soil, air, space and water, as well as the plants that provide food and shelter and are more likely to catch the tourist's eye. At the private game ranches where tourists are allowed to take hikes through the bush with a guide and gun bearer, the vegetative aspects of habitat may be described to them. However in national parks and reserves tourists are not allowed out of the vehicle nor outside the boundaries of their lodge. This is for safety reasons since any wild animal can be dangerous.

Soil Compaction

Mr. J. Sulieman is the resident naturalist at Sweetwaters Tented Camp, a private accommodation on a combination wildlife and cattle ranch, where predators are not allowed. He is also a retired KWS officer who worked in Tsavo West National Park. Mr. Sulieman pointed out that tourists experience the dust raised on the tracks that cross the savanna, but the damage neither seen nor felt is worse. Soil compaction leaves bare spots for years; erosion takes place on these bare areas; insects that live in the leaf litter and top few inches of the soil die and are not soon replaced. Habitat is changed but not for the better. These are longer term effects even than the dust (J. Sulieman, personal communication, August 2, 1994).

Overuse of Wood as Fuel Source

A modern and scenic two lane paved highway has been developed around Mt. Kenya to Isiolo. Kikuyu shambas (small farms) display a variety of produce in various stages, from freshly planted fields to road side stands of the latest harvest. The round thatched huts with wood smoke rising through the fresh air create a charming, although environmentally dismaying, picture for the traveler. It's that wood smoke that reveals an environmental problem for Kenya as well as many other developing countries and the rest of the world.

Around the world, non-industrial nations with rapidly growing populations, such as Kenya, use a tremendous amount of wood for heating and cooking. Dr. Daniel M. Kammen of Princeton University stated (1995, p. 33) that "in some poor nations over 90% of the total energy supply is derived from wood." This harvesting of old growth forests uses up not only trees but also decreases the biodiversity (variety of biological life) of the habitat. Increased soil erosion follows, leading to reduced production and causing some householders to spend up to 40 percent of their resources in time and money gathering fuel.

It's not only individuals who have to spend so much of their resources on energy. The national economies of developing nations have to allot a high proportion of their budget to imported fossil fuels, such as coal and petroleum. Over 35% of the carbon dioxide emissions thought to be causing global warming come from

developing nations. Dr. Kammen has initiated a project for helping Kenyans build solar powered ovens that has proved so successful that it has attracted attention and inquiries from other emerging countries (Kammen, 1993, p. 34).

Drought

One park where all the components of habitat are observable is Amboseli. In 1994 Amboseli was enduring its fourth year of drought. Where there had been sparse vegetation in previous years, there was only a barren alkali flat. The swamp still provided an oasis and a few water holes attracted grazers with the spring fed grass. But most notable in Amboseli was wind blown dust. Animals migrating in search of food created dust; Masai cattle moving into the park for water created dust; tourist vans in search of wildlife created more dust.

The drought merely exacerbated an existing problem. Is there enough habitat for indigenous populations with grazing cultures and the wild animals? Finding a solution for Amboseli has involved the national government, the county councils, environmentalists, researchers, the Masai and just about anyone else who has visited the park. There are several problems besides the drought.

Even though Amboseli may look parched it is an ancient, although currently seasonal, lake bed and has a high ground water table. This ground water is a magnet for thirsty tree roots. However, too much water can drown the trees. Some trees absorb salts from the water, killing them, and eliminating sources of food for elephants,

giraffes, and other browsers (animals that eat leaves of trees and bushes instead of grass).

The park looks over-used. With an estimated five years needed for the park to renew itself, closing the park to everyone is out of the question. The multi-national ownership of the safari lodges and the number of people making a living from the park make closing it economically and politically impossible. One driver had an interesting observation to make regarding closing Amboseli. Although it might help the vegetation, he felt it would be wrong to suddenly and completely close Amboseli to tourism because he felt the elephants would miss being able to watch the people. Aside from the mysterious affinity that frequently seems to crop up between human and elephant, this driver may have a point. Some animals, such as birds of prey, are known to need visual stimulation in order to lead a normal life. It could be that after 30 years of being studied and photographed the elephants of Amboseli would miss the tourists and researchers.

Introduced Species

Not all habitat conservation involves protecting from over grazing. Invasion of African habitats by adventive (non-native, introduced plants) is a major problem in some areas. Euphorbias and cacti provide an excellent exempt of native and adventive groups which have come into conflict. Both have evolved drought resistant characteristics because of similar environmental adaptations, even though they are not taxanomically related. The most obvious

Euphorbia in East Africa is the candelabra tree which is a native species, while adventive cacti are almost all native to the Western Hemisphere. Each will grow in the habitat of the other, and introduced cacti have become invasive weeds in East Africa's savannah areas, including the game parks.

Chapter 7

ROADS IN THE PARKS AND RESERVES

Safari drivers gave a universal answer to the question: What is the biggest environmental problem in the parks and reserves? The answer was an emphatic, "The roads!" This was the answer not only from drivers but also from lodge managers and park wardens, although those affiliated with the government referred to the roads as "infrastructure." "The roads" includes several major highways as well as the dirt and gravel roads within the game parks. The Masai Mara is the only park/reserve that allows off-road driving, and this may change as more studies are completed concerning the long term effects on vegetation. The rest of the parks/reserves require the drivers to stay on the dirt tracks which can be difficult and dangerous as well as uncomfortable.

Where the established roads tend to be worse than the ungraded terrain, it is little wonder that drivers are tempted acquiesce when clients want them to take short cuts or get off the road to be closer to the animals. In some places the graveled roads are impassable and drivers have had to develop new "lanes" in order to use the roads at all. These new lanes increase soil compaction and destroy insects and other life forms that live in the leaf litter and top few inches of the ground. This loss of biodiversity may be far more harmful in the long run than is presently known.

What is obvious is the cost to safari companies who have to replace their vans every year. According to John Ngugi, a United Touring Company driver, the suspension on his van consists of eight shock absorbers, two on each wheel. "And they are not the original ones," he said, "or we would never make it" (personal communication, August 14, 1994). More than once, bolts and axles have broken when he was taking tourists on a safari and John and his passengers ended up stranded in the bush. "It's not what the client is paying for," said John (J. Ngugi, personal communication, August 14, 1994).

There was some disagreement among the drivers as to whether or not roads in the parks and reserves should be paved. The arguments in favor of paved park roads, with speed bumps, were that it would prevent off-road driving and keep down the dust. Animals don't find dusty grass very appetizing and so they tend to feed far from the road and thus tempt off-road driving to provide better photos for clients. Tarmac roads might bring animals closer to the established roads or at least not drive them further away. Therefore the temptation to illegally drive off the road would be reduced, although probably not eliminated.

Some drivers were concerned that tarmac roads would deter animals from crossing the roads, allow drivers to go too fast, and perhaps prevent the animals from hearing an approaching vehicle and therefore get hit. More road kills were observed on the paved roads than on the unpaved roads. However the paved roads also had

more traffic and fewer large scavengers, like lions, to make away with the larger carcasses, like zebra. There could be signs warning of "elephant crossing" instead of "deer crossing" or "zebra" instead of "range cattle" next 20 km.

Despite the inherent difficulties, the vast majority of drivers want the pavement to stop at the park boundaries. Graded and graveled roads retain the "in the bush" ambiance and keep the excursion from being too much like a trip around a zoo. With constantly graded roads van drivers would not have to make new lanes to avoid the horrendous potholes. It would not, however, solve the problem of drivers driving off the road to secure better close up photos for their passengers.

Jim Mungi (independent driver) pointed out that this is not entirely the responsibility of the driver. Tourists should bring binoculars and proper camera equipment to get the pictures they want (J. Mungi, personal communication, August 3, 1994). Most tour companies recommend at least a 200 mm lens, but most tourists ignore the advice. They bring point and shoot cameras and then cajole and bribe some drivers into driving off the road in order to get the tourist close-up pictures with their inadequate photographic equipment. Once a vehicle track has been made it is likely to be followed by other drivers and so another road is created.

Certainly with the regular increase in park entrance fees paid by the international tourists, there should be money for road grading. So where does the money go? The universal answer, except from

government officials, is into the pockets of the local county council members. This is not an investigative report into a political scam but rather the belief of the Kenya citizens who were interviewed. County council members are not elected in Kenya; they are appointed by the central government and their actions may leave local residents feeling helpless to improve the situation.

Mr. Madi Shekali Madi, manager of Mara Serena lodge, also had a few comments to make about the roads in the parks. The county council had deposited large piles of gravel in the middle of the road leading to the Serena lodge. The gravel was to be used to resurface the dirt road, but in the mean time, all vehicles entering or leaving the Serena lodge had to drive in at an angle with tires on one side on the gravel piles and the tires on the other side in the ditch. Mr. Madi said it had been like that for so long he was going to hire the grading done himself. Neither was he happy with having to use the lodge landrover to pull other vehicles out of the mud when the landrover should have been taking guests on game drives (M. S. Madi, personal communication, August 20, 1994).

Some of the national highways are also sadly in need of repair. The highway between Narok and Enkare is now bordered by a six to eight lane dirt road. Drivers have created these new dirt lanes on each side of the established highway to avoid the treacherous pits in the paved lanes, which now serve as a sort of unofficial center divider. The condition of the roadbed has given rise to a new type of independent business endeavor. School age youngsters collect dirt

and gravel in buckets or blankets and then wait by the side of the road. When they see a tourist vehicle approaching, they drag the bucket or blanket to the pothole and ostentatiously empty it into the pit and then old out their hand for a tip. Tourists generally thought the kids deserved a tip just for initiative, but the idea was not popular among the drivers. Shaffi Musa, Pollman's driver, explained, "The children need to be in school. If they get money this way, they won't see a need to return to school" (S. Musa, personal communication, August 19, 1994).

For all the complaints, some of the roads are quite good. The road from Isiolo to Thompson's Falls has been well maintained and paved. The roads in Lake Nakuru National Park, which had been washed out by the last long rains, were being fitted with drainage pipes and bridges. Even though this meant constant short detours during the park's busiest season of the year, in three weeks the work had been satisfactorily completed and the road was well repaired.

Chapter 8

ENGENDERING LOCAL SUPPORT OF PARKS AND RESERVES

The Kenyan government and private enterprises are encouraging the native people to become involved in the tourist business or at least experience the monetary benefits brought by the tourist trade. This does not mean just selling rides and souvenirs. Both the Kenyan government and the private lodges train local people to work at the tourist resorts and camps. A lot of credit should no doubt go to the training programs, but the Kenyan people themselves seem to be naturally hospitable.

To keep the local people supporting conservation and wildlife a major effort is being made to involve the indigenous people in the profits of tourism. Patrick Pape's fees to the Masai chief on the Mara put money in the pocket of every member of that tribe. As a result an unsightly souvenir shop was removed from the Mara with the consent of the local Masai (P. Pape, personal communication, August 12, 1995).

In Samburu National Reserve a camel ride business illustrates one of the ways native groups are being encouraged to make money through tourism in ways that will help preserve, or at least not harm, the environment. No one is going to want to ride a camel through a trash laden, overgrazed or eroded landscape. Neither will there be any tourists to sign up for camel rides if there are no wild animals to bring them to the area in the first place.

After dinner, Samburu dancers from the local villages may perform at the lodges. The usual male chant and follow the leader processional is sometimes augmented by young ladies who provide an audible counterpoint. The girls, however, do not participate in the "trampolining" (standing jump) exercise. This performance increases the sale of Samburu beadwork and advertises the model Samburu village set up for tourists.

Not all of the local people, however, are benefiting from those expensive park/reserve entry fees. At the Sekenani Gate into the Masai Mara a small community has grown up which illustrates the misuse of the fees from the park/reserve that are supposed to help the indigenous people so much that they will support conservation. At Sekenani a new school building has been built but lacks desks, books and other materials. Even paper litter bags intended for the drivers at Sekenani Camp were redirected to the school because the backs of the bags had an environmental activity that the teachers could use. There is also a new medical clinic but it can only give advisory opinions. Patients still have to drive to Nairobi, over four hours away to get any medicine.

The Masai periodically have used drastic measures to express their displeasure at being restricted in their use of parks/reserves. In Amboseli the Masai killed all the lions because of being forbidden the use of the swamps to water their cattle. The drivers are surprisingly tolerant of such actions. Over and over again they said that while the Masai had killed game in the past and might again in

the future, they did it only in retaliation for not receiving the wells outside the reserve that the government had promised them. Even the most conservative drivers who felt that, in general, the Masai ought to "take baths and get real jobs" pointed out that the government was responsible for not keeping its promises.

Although many non-governmental organizations advocate letting the locals make enough money from wildlife that the locals will want to help preserve it, not all the organizations have the same goal. Missionary organizations that are trying to help the Masai and other local tribes improve their economic and health situations have done so by instigating modern agricultural practices. This has been especially true outside Amboseli National Park. There are no fences around the park to retain the animals and a newly green field of vegetables is an attractive delicacy to them. So the human populations surrounding the park put up fences to keep the animals out of the vegetable patch and in doing so block the animal's migratory routes. When animals can't migrate they have to forage in the park all the time and the vegetation never has a chance to recover.

The newly sedentary farmers have minimal interest in preserving wildlife for future generations when it seems to be at the expense of their own progress. Such short sighted improvement is expensive for their nation and people everywhere. But nomadic herders are less likely to attend the missionary church and so stable farming communities are encouraged (S. Musa, personal

communication, August 19, 1994), (J. Kisaka, personal communication, August 17, 1995).

Chapter 9

HIGHLIGHTS OF WILDLIFE OBSERVATIONS

The Masai Mara is the part of Tanzania's Serengetti plains that laps over into Kenya. The distinction is political and of no interest to the herds of wildebeest, gazelles, and zebra that annually migrate from one nation to the other as they follow seasonal rains. It is, however, a tribute to the two countries whose commitment to wildlife has overcome national boundaries.

When the short grass plains of the Serengetti become too dry and overgrazed to sustain the one and a half million migrating wildebeest and their followers, the wildebeest head north to the red oat grass plains in the Mara. The migration might begin anytime from June to possibly September. The herds stay in the Mara until rains in the Serengetti signal the renewal of the grass, and then they head back. This can happen almost anytime after they arrive in the north, but usually between late September and early November.

The Mara and the Serengetti are the last places in the world to witness this migration in approximately the same scope as in the past. This is what tourists hope to see and why so many visitors concentrate in one area in August and September. But not all wildebeest, gazelles, zebras and their predators are migratory. There are some that stay in the Mara and Serengetti year round or make very localized migrations as do the herds in Amboseli and Ngorongoro Crater. And, of course, there are a lot of non-migratory animals that

make the Mara their home--elephants, Cape buffaloes, cheetahs, lions, rhinos, giraffes, plus all the smaller animals and birds.

While the tourist is in Kenya to photograph the animals, there are still a few poachers, mainly from Somalia, who travel almost the length of Kenya in hopes of a rhino horn, elephant tusks, or spotted cat skin. The continuing demand for these items on the world market makes the profit worthwhile for individuals who have only their own life at risk. The poachers are difficult to find because they tend to live off the land, sleeping under bushes with only their blankets and weapons as equipment. Planes are effective at finding kills and camps where contraband is stored pending transport, but the actual tracking and capture has to be by police or rangers on foot. Despite the difficulties and expense, Kenya has done an outstanding job of stopping the slaughter. In case the poachers should find safari vans a more lucrative effort, armed guards ride with tourists where ever there is even the smallest possibility of trouble.

Armed guards accompany tourist convoys between Amboseli and Tsavo West National Parks because the area is less developed and attracts relatively few tourists. Poachers seldom attempt to kill animals where there are a lot of tourists. It is simply too easy to be caught when vans full of people are all on the watch for the same animals. So whatever the negative effects of tourists, one positive is that they deter poachers.

In Tsavo's desert landscape one of the biggest tourist attractions are water animals at Mzima Springs, a 3000 liter per hour upsurge of water fed by snow melt from Mt. Kilimanjaro in Tanzania. Welling up from underground channels through the lava bedrock two amazingly clear pools have been naturally created and harbor a year round population of crocodiles and hippos. An underwater observation area is provided for viewing the hippos and crocodiles as they swim by. Once seen this way, one understands why cartoon character hippos are so often featured doing pirouettes in tutus. These enormous creatures are extraordinarily graceful as they navigate underwater in bounding leaps of slow motion.

How the crocodiles and hippos that inhabit the springs got there in the first place is a mystery. They would have had to travel through miles of very dry and inhospitable scrub desert to arrive at this isolated oasis. It is unknown how they even know the water was there because the run off from the springs travels underground almost to the sea.

Hippos are quite dangerous animals. They periodically upset water craft that approach too near and can bite a person in two with sharp teeth and strong jaws. They will also attack any one who gets between the hippo and the water which is their refuge. This is unlikely to happen during the day when the hippos stay in the water and would be visible if on land. At night, however, the hippos get out and forage on the surrounding grass.

How much stress all the safari vehicles place on a lion, or any other feeding animal, is debatable. Some conservationists claim that tourist observation bothers the animals so much that they leave their kills and go hungry. Yet, lions and cheetahs are often photographed feeding while surrounded by tourist vans. It is possible that the numbers of vans involved are not as important as how close they are and how hungry the animal is. Hyenas will rip off a piece of meat and carry it away to eat elsewhere, but they were trying to protect their spoils from other hyenas, not tourists.

There is the question of whether or not a concentration of vans attracts competing predators and scavengers. In the case of the fragile cheetahs, who can not afford a fight because of the danger of breaking their light bones, attracting competitors may very well be a factor. A pride of lions, a clan of hyenas, or a single leopard have resources available to protect their kills. Heavy and strong enough in numbers to fight each other, lions and hyenas can frequently defend themselves. The leopard can carry his kill to the top of a tree and eat it in peace.

One cheetah showed some signs of stress when 15 vans lined the road behind her. That this cheetah was a 'her' is an educated guess since only female cheetahs are successful on their own. A male not affiliated with other males, usually his brothers, is rare and would be unable to hold such desirable territory by himself. This cheetah was exhibiting stress signs by sitting very still in one position and looking in the opposite direction from the vans. This appears to

be a relaxed and unconcerned posture but in reality the cheetah was avoiding looking at what was intimidating her. (Estes, 1993, p. 304).

This looking away in the distance action is a submissive gesture that in essence is saying, "OK, I give in, you're superior, just leave me alone." The cheetah knows that this is what she is saying, but since the tourists haven't a clue they stay and stare, and the cheetah wonders what's wrong, and what's going to happen next. The cheetah must be distressingly confused.

Being stressed for any length of time is bound to take its toll. Whether the cheetah is alert for food or predators, stress will affect its reactions. Cheetahs do have predators besides people. Lions, hyenas, and leopards all consider the cheetah competition and will kill one if they have the opportunity. Usually the adult cheetah can outrun its enemies, if it is aware of the danger.

Cheetahs do seem to be developing some adaptations to the presence of tourists. Some cheetahs hunt during the heat of the day instead of morning or evening to avoid being followed by vans (P. Pape, personal communication, August 12, 1994). This is not a particularly good change since being active in the noon day sun isn't any better for the cheetah than for mad dogs and Englishmen. And at a top speed of 69 mph, the cheetah can be very active. A better tactic for the cheetah and a lot more fun for the tourist is when a cheetah uses the vehicles as cover to approach as close as possible to the prey before starting its run. A cheetah was seen to do this--going from behind a landrover to the rear of a van, and then to front

of another landrover, and finally dashing out at a Thompson's gazelle which wasn't as oblivious as it looked and got away.

Having given the positive aspects of cheetah adaptation it is necessary to include a possible negative incident which seems incredible to anyone who knows much about cheetahs in the wild, and that includes the safari drivers who witnessed the event. James Kisaka, Pollman's driver, was the eyewitness who reported this and the incident was confirmed by Raffi Juma Shabani, Pollman's driver, who had arrived on the scene immediately afterwards. James had stopped his van, as had others, so his clients could watch three cheetahs that James thought were out hunting. Suddenly two of the cheetahs turned on the third cheetah, killed it and ate it (J. Kisaka, personal communication, August 16, 1995). Raffi reported that the two cheetahs left nothing but the head, and that the cheetah they killed was a female (R.F. Shabani, personal communication, August 20, 1995). Since female cheetahs remain solitary unless consorting, the inference is that two male cheetahs killed and ate a female cheetah. This seemingly bizarre behavior has yet to be explained, but too many people witnessed it to discount it as a made up story.

Cheetahs only manage to effect a kill on an average of 54% of their starts, 70% success on short grass plains and 37% on less favorable terrain. They have never been known to attack humans. For the most part cheetahs will not eat food they have not killed themselves, which can a present a problem with a captive cheetah. A keeper at the Mt. Kenya Safari Club zoo was asked about this and

he just shrugged and said, "Oh, occasionally we throw in a live chicken."

A cheetah cub has to be taught how to hunt. It is not born with the instinctive knowledge to chase the prey, hook it with its sharp dew claw and then, avoiding the dangerous horns, get to the neck and clamp its jaws on the prey's windpipe. Since the prey is exhausted from the chase it quickly dies. The cheetah has to eat quickly before scavengers arrive and steal the kill for themselves. Cheetahs lose about ten % of their kills to scavengers. Because the cheetah has sacrificed strength and weight for those light weight bones and streamlined body that allow it to run faster than any other land animal, it avoids fights that might result in a broken bone (Estes, 1993, p. 325).

When cheetah cubs are learning the rules of the game they are often more of a nuisance to their mother than a help. The mother brings captured live Thompson's gazelle fawns for the cubs to practice chasing. Some cubs have run away when confronted with such a ferocious creature (J. Kisaka, personal communication, August 18, 1995).

John Nyamache, a driver for Kenya Wildlife Trails, related an event he witnessed in Amboseli. A cheetah mother was taking her teenage-type cubs on a stalk and chase. Perhaps 12 safari vans were slowly inching down the road keeping pace with, but not getting in the way of, the animals. The mother cheetah made her rush at an impala buck. The cubs were willing but not very adept. The mother

chased the impala across the road. The impala doubled back between the vans; the cheetah followed. Both animals were going full speed. The impala doubled back again but this time slammed broadside into the side door of a van in the middle of the line. The door caved in, and the impala slid under the van, horns rattling on the undercarriage. The cheetah screeched to a halt and grabbed a haunch to drag the impala from under the van. Cameras were clicking away like mad, and on the other side of the van the cubs were trying to help by pulling the fore feet out their side, thereby engaging in a tug of war with their mother (J. Nyamache, personal communication, August 5, 1994). Parenting is evidently a universal trial.

For all the stories of how tourists bother the animals there do seem to be some animals that relish the limelight. Once on the Mara a solitary male cheetah was resting under a tree, occasionally twitching his tail, or rolling over or looking up--as if to count his audience. When the cheetah and the tree were finally surrounded by vans, the cheetah rose, stretched, walked around the tree, scent marked the tree, defecated, stretched some more, sharpened his claws on the tree, scent marked again, yawned and sat down and posed until every one had a picture and the vans began leaving. Then he flopped back down.

It is important that predators are sufficiently successful to keep the grazers and browsers in balance with the environment. But most private game ranches eliminate predators from their land, and so

what happens when the game population grows too large for the area? Mr. Sulieman, Sweetwaters naturalist, said, "Yes, that is a pertinent question. Since we are limited to the resources within the fenced area and do not have outside predators, the population of the grazing animals is regulated by climatic conditions and when necessary, culling. The culled animals are sold as excess meat to restaurants such as the Carnivore (popular Nairobi restaurant featuring game and exotic meats such as zebra, crocodile, and giraffe). Other excess animals can be relocated in areas where there is a need for repopulation greater than the existing population can provide. This game ranch-business approach seems to be the way to provide for the future of the animals as a species" (J. Sulieman, personal communication, August 2, 1994).

A species that appearS to be doing very well on their own is the Vervet monkeys. They frequently seem to be initiating relationships with people but they are only begging for handouts. These monkeys are abundant around the lodges and will enter rooms without invitation. Once in, they will appropriate anything available. The begging by the Vervet is a learned behavior caused by tourists who feed the little rascals. It is really much more interesting to watch animals foraging in their own environment instead of seeing them work the tourists for scraps. A word about the male vervet's sexual attributes--they are a lovely shade of blue. That accounts for the number of camera toting tourists stalking the creatures from behind, instead of trying the more usual frontal approach.

The Vervet at the park accommodations have lost most of their fear and even shyness around humans, at least the tourist variety. The monkeys will enter safari vans (through open roofs) and inspect and appropriate any contents they fancy. Tourists are well advised to take precautions ahead of time, such as not leaving available cameras, purses, etc., rather than disputing ownership after the sharp toothed and clawed simian has staked a claim.

Safari lodges do what they can to discourage both monkeys and baboons from infesting tourist living areas, but when tourists feed the wild animals to entice them closer for a picture or even in an attempt to pet the animal, the message received is: here's an easy meal and that's worth further investigation. Then the tourist complains about being attacked and/or losing valuables.

It is not only the small animals with which the tourists try to interact. One lodge in Amboseli had a family of elephants that would come for water and food on a regular basis. The lodge marked a white line on the ground and erected a sign admonishing tourists to stay on their side of the line when taking pictures or watching the animals. One lady tossed food to an elephant to draw it nearer the line. When the elephant was close enough for her picture she discontinued tossing food, but the elephant approached demanding more. The lady screamed and ran back to the lodge highly indignant that the elephant had not stayed on its side of the white line.

Should anyone doubt that the elephant was conveying a demand, one only needs to observe them for a while. The attitudes

expressed by their body language is incredible. Those scientists who have studied elephants have reported on the definite individual personality characteristics expressed by the elephants they have studied. Victoria, one of the elephants studied by Ian Douglas-Hamilton in Lake Manyara, Tanzania, even initiated a friendship between them, including physical contact (Moss, 1992, p.108). There is also Elena, an elephant raised by humans and now living in the area of Voi Safari Lodge, Tsavo West National Park. Elena has retained her fondness for humans as she has grown older and will put her trunk in the open top of a van or land rover to say "hello." Of course her tusks have grown with her and so now when she says "hello" she breaks the windows every time (J. Kisaka, personal communication, August 17, 1995).

Elephants generally find more valuable uses for their tusks. Those long front teeth (not incisors as one might expect) that have evolved into tusks are used to dig water holes in the dry season, incidentally benefiting other animals who use the water holes after the elephants are finished. The tusks are also used to dig mineral salts from the earth. Mt. Elgon National Park contains deep caves excavated by salt seeking elephants. Tusks can rip bark from trees for the elephants to eat; they can give a fellow elephant a good poke to make a point or wake him up; the tusks have even been known to be used to try to lift a fallen comrade.

In some areas of Africa there has been a marked increase in the number of tuskless elephants. The large tusked elephants have been

victims of natural selection. The selection, however, has been done by poachers not by the elephants themselves. There is a large enough gene pool of African elephants to reinstate tusks, given time (J. Sulieman, personal communication, August 2, 1994).

Chapter 10

RECOMMENDATIONS FOR THE FUTURE OF KENYA'S GAME PARKS AND RESERVES

Kenya offers the ecotourist a wonderful experience. The tourists get an up close look at wild animals living their lives in a normal manner, and the tourists can do so while living in a more or less normal manner themselves. Camps and lodges are more comfortable than in neighboring countries and although the majority of the roads are not particularly comfortable, they too are better than what many other African nations have to offer.

This doesn't, however, mean that parks and reserves can't be improved. The roads, which have deteriorated to the point that the safari drivers could talk of little else, do need to be continually graded for safety and to protect the environment from off-road driving.

Jim Mungi, independent driver, pointed out that such grading would save wear and tear on the vans, allow them to last longer with fewer repairs, save the companies money so that they could lower tour prices, which would attract more visitors and make more money for all Kenyans (J. Mungi, personal communication, August 9, 1994).

The problem, of course, is a nation with limited resources and conflicting priorities. The immediate need of hungry people takes precedence over maintaining roads that are serviceable even if they are not ideal.

A continuing effort is being made to educate the Kenyan people about their wildlife resources. Domestic tourism is very limited in Kenya's game parks even though entry and lodge fees for Kenya's are about 10% of those charged international visitors. If the people do not experience and understand the value of wildlife to their economy, heritage, and future they will not preserve it. This really presents two problems: the need for local people to benefit directly from the game parks and the need for all of the population to value what their country has to offer. KWS and some local council projects seem to the most effective method of promoting local appreciation of the benefits to be received from park/reserve profit sharing.

With 64 parks/reserves available, it seems self defeating to use only about 10. The problem is infrastructure. Roads and accommodations do not necessarily coincide. Marsabit National Park is one example. There is an adequate, but deteriorating lodge run by the Msafari chain in an area containing abundant wildlife and even some historical interest for those aware of Osa and Martin Johnson's pioneer wildlife photography. However, to reach Marsabit one must travel for at least six hours on a rough, hot dusty, semi-graded gravel "highway." At present, travel has to be in a military convoy because of possible raids by Somali shiftas. The very expensive alternative is to fly.

Kakamega Forest illustrates the opposite problem. A good road provides access, but accommodations consist of eight rooms in a self-service forestry lodge and a small camp site. There is other

accommodation outside the forest, but with entry fees of $25 per day plus $6 for vehicle and driver, most tourists feel they should get to stay in the park.

Instead of the government vaguely talking about gazetting part of the Matthew's Range as new park, it would seem more effective to develop the parks and reserves already in place. The government should tarmac the road from Isiolo to Marsabit and encourage permanent tented camps in both Marsabit and Kakamega. There are other parks/reserves such as Mt. Elgon, Meru, and Saiwa Swamp where this would be effective. The net result should be more tourist income in more locations, and therefore, more Kenyans interested in preserving the wildlife resources.

There are two rather small separate movements in Kenya which are only peripherally related to tourism and the overuse of parks/reserves. Together they might alleviate some stress on the animals and the environment as well as make some of the less frequented parks more appealing. The two movements are protecting and preserving "sacred groves," and establishing wildlife corridors. Combining these two already existing domestic interests might be a way to serve both interests, create biodiversity, increase gene pools, open up new tourist attractions and save money.

The best use of game park tourism has to be focused on preserving the total ecology of the parks and reserves. To do this two continuing projects have to implemented and expanded. The local people must experience a direct benefit from preserving the parks

either through monetary gains or cultural preservation. Kenya has made a beginning in this area that could now be more fully developed.

Secondly, for long term benefits the local people must receive environmental education. For this the schools alone will not suffice. Domestic tourism and park interpretive programs are needed. "Parks have been called society's greatest classrooms without walls...." (Jacobsen, 1990, p. 20). A study of three South Africa parks showed on increase in awareness of conservation issues among local visitors, who visited parks on day visits and partipated in at least one educational informational offering, of 11.2% to 20.5% (Preston & Fugle, 1987, p. 27). Although South African parks and Kenya's are not strictly analogous, the potential for environmental education is there.

To acquire the public support necessary to improve and develop game parks/reserves for tourism will not be accomplished overnight. At present domestic use, primarly small subsistance farms, are encroaching on the national parks and reserves at a rate of five kilometers per year. (M. S. Madi, personal communication, August 20, 1994). To maintain its attraction for foreign tourists, Kenya must plan ahead to rescue its overcrowded parks and convince the local people of the advantages of game parks and reserves for their present and future benefit.

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