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BLACK RHINOCEROS CONSERVATION IN KENYA--A FIELD SSP?

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In nearly all of Africa, the population decline of the black rhinoceros has been precipitous. Poaching for rhino horn has been relentless, often fueled by money generated in the Middle Eastern oil economy. Spears, traps and rifles have been replaced by semi-automatic AK-47 fire, as many game departments find themselves outmanned and outgunned. The result has been a drop in the African rhinoceros population from an estimated 65,000 in 1970 to 4,000 or fewer today. The black rhinoceros population in Kenya has not been exempt from the slaughter; in 1986, 377 animals remained of an estimated 20,000 in 1970.

In many countries of the African continent, current political, economic and environmental events do not bode well for the reversal of this downward trend, though at present, at least three countries appear to have the active plans for conservation of their remaining rhinos--Kenya, Zimbabwe and South Africa.

Note: This report is based on a one-week study tour in August 1986 of Kenyan black rhinoceros facilities and interviews with Kenyans working in various aspects of their conservation program. The tour was supported by the St. Louis Zoo as an extension of a St. Louis Zoo Friends Kenya/Tanzania photosafari. Much of the numerical data and sanctuary information is drawn from an interview and reports supplied by Mr. Peter Jenkins, senior game warden in the "Save the Rhino Project." Additional information is drawn from the African Rhinoceros Workshop held at the Cincinnati Zoo in October 1986. Any opinions presented are those of the author.

South African game protection efforts have resulted in stable, and perhaps increasing populations of this species (estimated 640). Zimbabwe has suffered heavy poaching losses in the Zambezi River Valley, but government support has allowed increased protection of the remaining animals. President Mugabe has given orders that game officials may shoot first at suspected poachers, and the government has funded a relocation program from the Zambezi Valley to more protected parks within Zimbabwe. An estimated 1,680 Zimbabwe black rhinoceroses remain.

The Kenyan conservation program will be based on a "sanctuary" concept--the maintenance of small (30-40) herds of black rhinoceroses in fenced game parks and reserves, patrolled by armed guards. The precedent for the plan exists on several "rhino ranches" in central and northern Kenya. The plight of the black rhinoceros in Kenya has not only received governmental and international attention, but also increasing attention from the Kenyan populace. The successful fund-raising walks from Kampala to Mombasa of Michael Werikhe, the "rhino man," were perhaps even more valuable in raising the level of problem recognition with the East African press and public.

Tsavo National Park is an example of some of the problems faced. As late as 1969, 6,000-9,000 black rhinos lived in Tsavo--a park that possesses some of the choicest rhino habitat in Africa. A population of one rhino per square kilometer was considered carrying capacity in many areas. At this time, and previously, rhinos had been widely translocated within Kenya in a government program in which dealers were required to translocate an animal at the wildlife department's request for each animal they shipped. By the mid-1970's, Peter Jenkins, a senior game warden, had noted a rapid decline in the black rhinoceros numbers in Kenya. In 1979, he began drafting a "Proposal for Black Rhinoceros Sanctuaries in Kenya," and a census of the remaining animals was undertaken. Combinations of drought, unknown die-offs and poaching have plunged the current Tsavo population to as low as 100-150 widely scattered animals--animals so widely separated that their ability to successfully find mates is in doubt. The decline was not unique to Tsavo and was repeated in most other parks.

In the early 1970's, Courtland Parfet, an American who owns Solio Ranch in Kenya's central highlands, became interested in stocking his 14,000 acre game resèrve with black rhinocoerses. Electrified fencing powered by generators contains the animals. Effective policing, currently supervised by Major Rodney Eliot, who spent a career as a game warden in the Northwest Frontier, combined with rumors of man-eating lions within the preserve created a successful record--no animals have been poached to date. The initial 23 animals have increased to an estimated 85-90 in 1986, a number that many, including Major Eliot, consider a likely overpopulation. This herd will supply 25-30 animals for translocation to the initial government project at Lake Nakuru. Dr. Dieter Rottcher, a veterinarian with ILRAD, an international veterinary research group in Kabete, will anesthetize the rhinos

for movement to field enclosures on Solio, prior to their road trip to Nakuru. He also provides veterinary service for rhinos on several of the other ranches and in government projects. In addition to the black rhinoceroses, 30-40 white rhinos also inhabit the Solio preserve.

A newer facility exists at Lewa Downs, near Isiolo. On a 40,000 acre ranch owned by David and Delia Craig, Anna Mertz has the use of 5,000 acres for the creation of a rhino preserve. She has financed the enclosure of the semi-arid terrain with a solar-powered electric fence. Two substations power it, and alarms are triggered if it is broken. Mrs. Mertz employs 12 local Kenyans as guards. If a breech in the fence is suspected, the ranch manager has a light plane to patrol the perimeter. In 1986, 11 black rhinos lived in the preserve, including two calves. One was being bottle raised, for it was born shortly after its dam's translocation and was neglected. Subsequent calves born at Lewa are being dam raised. Poaching is a present threat; in July 1986 20-plus elephants from a herd of 80 were killed in one raid by poachers on an adjacent ranch. Mrs. Mertz would like to fence an additional 1,500 acres, as she considers the present area near carrying capacity, but the additional capital and operating costs are major considerations.

Laikipia Ranch, located near Rumruti and managed by Colin Francombe, is an additional rhino facility. It is unfenced, dense thornbush terrain. The population there is estimated to be 40 rhinos, but a range of 10-60 is considered possible due to census difficulties in the thornbush. In addition, Pokot tribesmen of the Rift Valley are in possession of weapons that have spilled across the border from the Ugandan war, and present a poaching threat. Laikipia has received financial support form Rhino Rescue UK, and the London Zoological Society is sponsoring a field researcher, Dr. Brett, on the ranch. He is attempting to identify individual rhino by their spoor and study their social behavior. Preliminary studies indicate that one bull may roam over large areas of the ranch, including numerous other bull territories. The work will hopefully provide data regarding field rhino identification and social structure that will be invaluable to the long-term management of these small wild populations. All black rhinos at Laikipia, at Solio and Lewa Downs, as well as the game reserves and parks, are considered government property.

Lake Nakuru, famed for its vast flocks of flamingos, is to be the first Kenyan park recipient of translocated black rhinos in the sanctuary plan. Nakuru is a relatively small park (39,500 acres land, 14,800, water) and in close proximity to the city of Nakuru. The area historically has had rhino (they were described as numerous in reports c. 1900). Though it appears to have adequate rhino habitat, only one to two animals remain in the park today. In an effort parallel to that of the ranches, the park's perimeter has been enclosed with solar-powered electric fence, a capital outlay funded in part by the World Wildlife Fund. The Kenyan government is to fund new ranger outposts,

roads and increased personnel to protect the animals. According to Andrew Koyo, warden at Nakuru, a major concern of the restocking effort is the nutritional status of the available browse at Nakuru. Lake Nakuru is a Rift Valley alkali lake with a fresh water inflow, but no outflow. The lake has become alkali by the subsequent concentration of minerals by evaporation, and the surrounding soils have become deficient in many minerals by the leaching action of the water. The Nakuru area is known to be deficient in copper, cobalt, iron, phosphorous and selenium. Antelope in the area have shown signs of posterior incoordination (enzootic ataxia) and rough, faded haircoats typical of copper deficiency. On an adjacent ranch that supplements trace mineral salt to its domestic stock, the antelope that reside there do not manifest these symptoms. The Imperial College of Science and Technology (Great Britain) is scheduled to study the pre- and post-translocation nutritional status of the black rhinoceroses. Placement of trace mineral blocks within the park is under consideration. Additionally, the freshwater streams that supply the lake and serve as a water source for the wildlife are seasonal, so supplementation of springs at the north end of the lake and possible windmill-powered wells are in the planning stages.

If the Lake Nakuru project meets with success, other Kenyan parks and reserves are scheduled for inclusion in the sanctuary master plan as future translocation sites. Several already have projects underway. Thirty-two black rhinoceroses from multiple past translocations currently reside in Nairobi National Park. That population appears to be stable, though further studies may more clearly define the population dynamics of that group. Plans exist to upgrade the current perimeter fence, and perhaps enclose the remaining open perimeter of the park that borders the developing Athi plains. In Tsavo National Park, four rhinos are protected in a 3 square km fenced area in a project funded in part by the British group, Zoo Check. As previously noted, the remaining Tsavo populations are widely scattered and in the initial phase; only three female rhinos were located for inclusion in the protected area. However, in August 1986, wardens were alarmed to find the perimeter fence broken. An immediate check of the compound's inhabitants found four animals, the intruder being a male black rhinoceros. According to Patrick Hamilton, head of the Wildlife Department's translocation efforts, the government would like to increase the area to 140 square km, capable of holding up to 100 animals. If at some future time, the park would become safe again, the gates could be opened and the relatively limitless spaces of Tsavo could become a "sink" for surplus rhinos in the sanctuary.

The Aberdare Park in the central mountains of Kenya is home to an estimated 37 black rhinoceroses. Plans are underway to reinforce a partial trench and fencing system already in place and to totally enclose the Salient area, once a rhino stronghold. Some poaching continues with local groups using dog packs, but according to Ian Hardy, game specialist at the Ark, predation of rhino calves by hyenas may also play a significant role in this

population. Hyena sightings at the Ark have increased nine-fold from 1970-1976, and Hans Crocker of the Serengeti Research Institute is slated to study the Aberdare hyena population and its effects on the wildlife in the park.

Masai Mara is also included in the program. It is not a national park, but a game reserve under control of the local (Narok) county council. A plan was developed to protect the remaining rhinos in situ, for any attempts to move them away from the park are politically unlikely to succeed. Though the current population in the Mara is 14, down from 27 in 1984, the decline appears to have stopped with changes in the protective forces for the rhinos. At least one female is known to be breeding, but she has lost two calves to lion and hyena predation. A fenced rhino sanctuary in a triangle at the northern edge of the park has been proposed. Site selection was complicated by several factors. First, suitable habitat had to be located, as a varity of factors in the Mara have reduced the bush and woodland thickets favored by the rhino. Additionally, problems were faced placing the sanctuary in such a way that fencing would not interfere with the migratory paths of the wildebeest and zebra.

An additional sanctuary is proposed for Meru National Park, once home to the highest density of black rhinos in northern Kenya. A population of 200-300 in the early 1970's was represented by five animals in 1986. Additions to the existing perimeter fence near the Kindani area would create a second triangular sanctuary. Other populations are difficult, if not impossible, to deal with. The Mt. Kenya population is a case in point. It is estimated to be 30 animals, but the number is uncertain due to rugged terrain. It is terrain that would also greatly hinder any effort to manage the animals for protection or for translocations.

The black rhinoceros situation in neighboring Tanzania may be even more tenuous. Ngongorogoro Conservation Area may contain only five adult black rhinos--a number exceeded by the inventory of several U.S. zoos. Perhaps most tragic is the fate of the rhino population in the Selous Game Reserve in southern Tanzania. An estimated population of several thousand had been reduced to an estimated 200-300 in 1986, and more recent estimates put the number as low as 50. A forthcoming plan to enhance protection of this vital reserve is to be jointly funded by the World Wildlife Fund, the African Wildlife Federation, and the Frankfurt and New York Zoological Societies.

In response to the increasing endangerment of the black rhinoceros, field zoologists, representatives of five AFrican governments, veterinary researchers, population scientists and zoo managers all met in Cincinnati in October 1986 to review the current situation for all species of African rhinoceroses and to identify areas of mutual interest and cooperation. As became clear at the Rhino Workshop in Cincinnati, the fate of the Selous may illustrate the future for many of the black rhinoceros populations in Africa. Where large and remote black rhinoceros

populations were once thought to be relatively safe vis-a-vis poachers; in fact, they were not. Vast, remote, and poorly defended areas such as the Selous of Tanazania or the Luangwa Valley of Zambia have been the sites of massive poaching, and in the process, their large and contiguous populations have been decimated.

In contrast, the rhino populations of several small, relatively urban parks, e.g., Nairobi National Park, have remained comparatively stable. Many field workers expressed the opinion that similar small, protected populations may be the best hope for the immediate future of the black rhinoceros in eastern Africa. The possible success of such projects can be viewed in the growing herd at Solio. However, the creation of pockets of 30-50 animals in national parks and reserves will in itself create problems of separation by intervening farmed, populated and unprotected areas. These rhino populations risk effectively becoming "islands," and attendant with that will come the problems of small population demographics. The cooperative and scientific aspects of the Species Survival Plans (SSP's) in zoos, may be required for the effective maintenance of genetic diversity in these wild populations.

The Cincinnati Rhino Workshop established conservation priorities for four subspecies of the black rhinoceros: 1) the southwestern population in Namibia, 2) the south central population that extends from Natal to Zimbabwe to southern Tanzania, 3) the northwestern population that extends from the Horn of Africa to the Cameroons, and 4) the eastern population represented in Kenya and northern Tanzania. Of these four, only the eastern population is well represented in zoos. Population modeling applied to these black rhinoceros subspecies suggests that in order to maintain a desired genetically effective population of 500 animals, a minimum total population of 2,000 will be required for each group. The current total black rhinoceros population (4,000 or less) is clearly below the 8,000 needed for the maintenance of four subspecies. Only the south-central group approaches 2,000 animals, and in none of the groups are 2,000 contiguous animals likely to occur in the foreseeable future. These smaller, and often fragmented, populations will require genetic interchange to maintain their effective population size. Thus, the genetically planned transfers of SSP animals from zoo to zoo may be mirrored in future rhino exchanges from sanctuary to sanctuary, often crossing political boundaries.

According to Peter Jenkins in 1983, "It is no exaggeration to say that the fate of the rhino will be sealed within a decade unless a long-term management policy is effected." The future not only of Kenyan, but all African black rhinoceroses, hangs in the balance. It appears that the establishment of fenced, guarded sanctuaries is one of the few resources available that will provide viable conservation alternatives for the remaining east African animals. Weighing in the future of the government sanctuaries are the tremendous costs in capital outlays and in fielding a large and effective ranger force. The future of the

ranches has to be considered in terms of the long-term outlay of funds, for they would appear to be heavily dependent on the ongoing interest and financial generosity of their present owners. However, the success of such reserves can be seen, and its repetition at Nakuru and other projects to come can be fervently hoped for. Cooperation of governments, private individuals and conservation organizations is witnessed at Lake Nakuru, and will be needed in the future. The present Kenyan government and populace would appear to have made the preservation of the black rhinoceros a high conservation priority--one that may provide a "flagship" for other conservation programs.

Assuming that the immediate problems of Kenyan rhinoceros sanctuary establishment and rhino protection are overcome, then the long term will provide the challenge of genetic management of small populations of wild black rhinoceroses; if you will, the establishment of "field SSP's." It is a forthcoming challenge that will provide new opportunities for the application of the zoo SSP experience to animals in their native habitat.

BLACK RHINOCEROS POPULATION ESTIMATE (1986)

Ngong	1 (1-7)	
*Mero	3 (5)	NP
Lewa Downs	11	Priv
Ol Jogi Ranch	7	Priv
Solio Ranch	85 (90)	Priv
Laikidia Ranch	40 (10-60)	Priv
Mt. Kenya	30 (guess)	NP
*Aberdare	37	NP
Rondyoni Mt.	1	
*Nairobi	32	NP
*Masai Mara	15	GR
Tsavo East	100 (150?)	NP
*Tsavo West	4	NP
Lewalani	4	
*Nakuru	1	NP
	377	

NP = National park

Priv = Private

GR = Game reserve

* = Suggested sanctuary site