

Kenya Rhino File

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KENYA WILDLIFE SERVICE

KENYA RHINO PROJECT

ANNUAL REPORT

1991

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Rhino Project Coordinator

INTRODUCTION

This annual report covers the activities that took place during 1991 as part of the Kenya Rhino Project, a KWS special programme for the conservation and management of the black rhinos in Kenya. Further development of rhino sanctuary infrastructure took place in several areas, including Tsavo West NP (Ngulia sanctuary water supply and buildings), Lake Nakuru NP (water developments), Nairobi NP (second phase of fencing) and Aberdares NP (sub-headquarters, second phase fence line).

Although the year had some rhino accidents and emergencies, notably in the Lewa Downs rhino sanctuary and Amboseli NP, the year was still a successful one in general for the continued protection and breeding output of the rhinos in the major sanctuary areas of Kenya. Births of black rhinos recorded in these areas outnumbered deaths by 2.5 to 1 in 1991, sanctuary populations grew on average at 4 per cent, and the sanctuaries contained 317 out of the minimum number of around 410 black rhinos in Kenya by the end of the year.

The general picture remains that of a stable or increasing total number of black rhinos in Kenya, composed of a steadily increasing number of rhinos breeding up in sanctuaries, and a stable or decreasing number of rhinos still remaining in outlying areas with lower levels of security and monitoring.

White rhinos continue to increase in Kenya, and now number around 65 in total. All except two of these are on private land, the majority found in the expanding Solio ranch population of around 50 white rhinos, with other small populations located on the Lewa Downs and Ol Jogi ranches, and at the Mt Kenya game ranch.

STAFF

Rhino project staff which served during 1991 are listed below. Mr Keech took over as officer i.e. Ngulia rhino sanctuary in place of Mr Munyambo, who moved to be 2i/c at Nairobi NP under Mr Oloo. Mr Kagwi replaced Mr Mulwa at Lake Nakuru NP. Mr Mulwa subsequently assisted with rhino monitoring and surveys in several areas based from KWS HQ, including Aberdares NP and Kitchich.

<u>Area</u>	<u>Officer(s)</u>
KWS HQ	R A Brett; E W Wanjohi
Nairobi NP	T W Oloo; R O Keech, O Munyambo (2i/c's)
Lake Nakuru NP	P Mulwa, J Kagwi; J Mwangi King'ori (2i/c)

<u>Area</u>	<u>Officer(s)</u>
Tsavo West NP (Ngulia)	J Kagwi, O Munyambo, R O Keech
Aberdares NP	D ole Konchella
Amboseli NP	M L Kipkeu
Kitchich, Ngeng Valley	M Lenaimado (Eden Trust KWS)
Masai Mara NR	D Round-Turner (FOC/NCC)
Loita Hills	M Kipelian (Eden Trust, FOC)

In Nairobi NP, Lake Nakuru NP, Tsavo West NP (Ngulia rhino sanctuary), Masai Mara NR (NCC) and at Kitchich (Matthews range), there have also been rangers assigned specifically to rhino surveillance and security work, coupled to the monitoring of rhinos coordinated by the officers in charge of the rhino project in each area.

J W Kagiri, officer in charge of the new KWS fence unit, took over responsibility for construction of new rhino sanctuary fences and maintenance of existing fences from the rhino project coordinator. Rhino project officers in areas with fences continued to be responsible for fence maintenance in their respective sanctuaries.

KENYA RHINO POPULATION STATISTICS

The status of the black rhino in the 11 major rhino conservation areas or sanctuaries in Kenya at the end of 1991 is shown in Table 1. As in previous years, the exact numbers of black rhinos existing outside these areas (listed in Table 2) are known with less precision, and the populations are in general less well monitored. Some of these populations clearly warrant improved protection and monitoring *in situ* (e.g. Matthew range, Loita Hills), where the populations are not small and are probably increasing in size. Others are likely to have no chance of natural increase or even short-term survival, and thus should be captured and translocated to stock or augment existing rhino sanctuaries. Combining these approximate figures (Table 2) with those of the rhino sanctuaries (Table 1), we get a minimum total number of 410 black rhinos in Kenya at the end of 1991.

Slow growth has continued in 1991 in the sanctuaries (4% increase), similar to the average of 5% increase recorded from 1986-90. This represents a balance of the output from highly productive rhino areas (e.g. Nairobi NP, Solio ranch) with those which at present are showing little net population increase (Lewa Downs ranch, Laikipia ranching). There exists some uncertainty about the exact numbers of rhinos in the Aberdares NP and Laikipia ranching, and detailed census of these areas is a priority for 1992; however some progress was made during a short census of the black rhinos in the Salient of the Aberdares NP during 1991 by Messrs Mulwa and Konchella.

Rhino Area: Type & Name	---Males---				---Females---				--Unknown Sex--				-----Management-----				---Breeding---			1986-91		1991		Trans-91						
	AD	SA	CF	ST	AD	SA	CF	ST	AD	SA	CF	ST	TOT	AREA	DENS	CC	ML	S	SR	%CC	%C	+	-	+	-	In	Out	CR		
FINN-FENCED:																														
Lisa Nakuru NP	10	3	1	14	8	2	3	13			3	3	30	142	0.21	71	53		1.08	88	23.3	9	1	3	1					
Nyirata RS	3	2		5	6			5	1	1	2	13	73	0.18	73	55		0.93	17	7.7	4	2	1		1					
Sabina R GR	16	7	7	30	17	8	5	30			2	2	62	70	0.89	60	45	20	1.00	82	22.5	29	6	6						
Lena Downs R	1			1	5	5	3	10			1	1	12	49	0.30	26	20		0.10	80	33.3	6	5	2	4	1	1	1		
Ol Pejeta R GR	2	3	1	6	3	3	1	5				0	11	73	0.15	20	15		1.20	67	18.2	5	2	1	1	1	1	1		
Ol Pejeta R GR	2	2		4	1	1		3			1	1	8	93	0.09	93	70		1.33	100	12.5	1	1	1	1	1	1	1	1	
Total	34	17	9	60	40	15	12	67	0	1	8	9	136	491	0.28	339	255	20	0.90	73	21.3	54	17	14	7	3	2			
PART-FENCED:																														
Murubi NP	20	4	8	32	17	5	7	29	1	1	2	63	117	0.54	60	45	18		1.10	94	25.4	22	3	4	1		1			
Spekres NP	10	3	3	16	15	4	5	24	4		1	5	45	70	0.54	100(100)			0.57	60	20.0	13		5						
Kalabaria R	17	4		21	9	4		13	3	2	2	7	41	397	0.10	100(100)			1.62	22	4.9	7	1	1						
Total	47	11	11	69	41	13	12	56	7	3	4	19	149	584	0.26	260	245	18	1.05	66	18.1	42	4	10	1	0	1			
UNFENCED:																														
Masai Mara NR	6	3	5	15	11	2	2	15			1	1	30	1630	0.02	50 (50)			0.93	73	26.7	14	2	3						
Amoseli NP	1			1	1			1				0	2	330	0.01	50 (50)			1.00	0	0	3	5		3					
Total	7	3	5	15	12	2	2	16	0	0	1	1	32	2030	0.02	100	100	0	0.94	67	25.0	17	8	3	3	0				
TOTALS	88	31	25	144	93	30	25	149	7	4	13	24	317	3155	0.10	699	600	38	0.97	69	20.2	113	29	27	11	3	3			

Key: AD=Adults (>6 y.o.)
SA=Subadults (4-6 y.o.)
CF=Calves (<4 y.o.)
ST=Subtotal (Sex)
TOT=Population total
AREA=Area of rhino reserve (sq km)
DENS=Density of rhino (per sq km)
CC=Carrying Capacity (Brett (1989) estimate)
ML=Management Level
S=Existing Surplus of Rhino (number of rhino exceeding ML (TOT-ML), available for translocation)

SR=Known Sex Ratio (No.Males/No.Females)
%CC=Percentage of Adult Female (Cow) Rhinos with Calves
%C=Percentage of Calves in population
+ =Total No. of Births for stated period
- =Total No. of Deaths for stated period
Trans-91=Total No. of translocations in and out of sanctuary in 1991
CR=Census Rating (Du Toit 1989)
NP=National Park
NR=National Reserve
GR=Game Reserve
R=Private Ranch

Table 1 - Population Statistics for the black rhino in Kenya sanctuaries (at the end of 1991), and overall breeding performance from 1986 to 1991

Table 2 - Numbers of black rhinos living outside designated rhino sanctuaries

Tsavo West NP	15
Tsavo East NP	2
Mt Kenya NP	10
Aberdares NP North	4
Loita Hills	14
Ngong Valley-Kitchich	14
Karissia Hills-Barsaloi	6
Keno-Ndoto-Losai	3
Latinek ranch	4
Tana River-Garsen-Lamu	8
Wajir District	2
Jilori-Chacama	1
Chyulu Hills North	2
Sultan Hamud	2
Orphans	6
Total	93

MANAGEMENT AND BREEDING

In general the security of KWS rhino sanctuaries has been adequate, but must be improved in all areas; security remains by far the most important consideration for rhino conservation in Kenya. This country has been spared the heavy poaching of rhinos which has continued in Zimbabwe, where over one hundred black rhinos were poached in 1991. Three black rhinos are known to have been poached in 1991, all in Amboseli NP. Clearly the demand for rhino still exists, illegal trade continues despite global bans, and tight security must be maintained if the present limited success of the rhino conservation programme in Kenya is to persist. Several rhino areas need increased staffing and equipping to ensure adequate protection. An establishment list for security in rhino sanctuaries has been drawn up and agreed with Mr Bashir, DDS, and presented for necessary recruitment by KWS.

The electric fences at Ngulia rhino sanctuary and at Lake Nakuru have continued to perform satisfactorily. The fence around the Salient of the Aberdares NP requires improved maintenance. Progress on the second phase of the Aberdares fence line has been very slow; the line North from Wandari's Gate had only been cleared to around 10 km by the end of the year. Improvements were made to the existing Nairobi NP fence, in addition to the second phase of 14 km of fence added to the West (Langata) boundary of the park, designed and constructed entirely by the KWS fence unit under Mr J W Kagiri. The fence between East Gate and Carnivore has continued to show low, ineffective voltages. It is hoped that when this

fence line is reconstructed with an improved configuration inside the new road pipeline inside the present boundary line, earthing will improve and hence the voltage across the fence.

The fence unit organised the training of seven KWS officers at Animatics Ltd. These staff will be responsible for maintaining the existing rhino sanctuary fences. Monsanto donated 80 litres of 'Roundup' herbicide and eight backpack sprayers to the four KWS rhino sanctuary fence maintenance teams, and organised training for the fence foremen from each of these areas in the operation and maintenance of these sprayers at Hardi Ltd.

A list of all vehicles employed under the KWS rhino project is given in Appendix II.

The management policy for the several rhino populations in Kenya remains as follows:

- (a) to protect and breed up black rhinos as fast as possible in secure rhino conservation areas, or sanctuaries;
- (b), to capture and translocate isolated, non-breeding, inviable rhinos into rhino sanctuaries for their own protection and contribution to breeding output;
- (c), to remove surplus black rhinos from areas where the population is approaching (or more than 75% of) the ecological carrying capacity for rhinos in a conservation area, being the point at which browse reserves are diminished and/or breeding output is lowered as a result of the high density of rhinos;
- (d), to use these surplus rhinos in stocking new rhino sanctuaries and release sites which have been identified as priority areas by the Director, KWS and the National Management Committee of the rhino project.

The carrying capacities and management levels of the rhino sanctuaries (listed in Table 1) have remained as last year, but require updating after improved ecological monitoring has started in these areas. It is hoped that this will take place as the new KWS Ecological Monitoring Unit starts work under Mr Fred Waweru, recently employed as Senior Ecologist at KWS.

The carrying capacity of Solio ranch game reserve has effectively been increased by the addition of at least another 15 sq km of ideal rhino habitat at the North West corner of the existing reserve. The number of black rhinos on Solio continues to exceed its carrying capacity even with this addition, as very few rhinos have moved into this new area yet, and the present area continues to be overbrowsed, and certainly needs to be allowed to recover. The other area with recognised surplus of rhinos is Nairobi NP, and Nairobi and Solio between them could supply over 30 black rhinos for relocation to other areas at the end of 1991.

Table 1 lists all births, deaths and translocations carried out in the 11 major rhino conservation areas in 1991. 27 births were recorded against 11 deaths. 3 black rhinos were poached (all speared/shot in Amboseli); 5 met accidental deaths (3 rhinos were fatally injured after falls,

1 rhino died from throat blockage, and 1 died after breaking a leg when trapped between two fallen trees); 1 rhino died from fighting, and 2 rhinos died from unknown natural causes (1 unsexed calf, 1 adult female)). The horns were recovered from all rhinos that died with the exception of one animal poached in Amboseli.

An additional rhino birth was recorded to a female resident near Kamboyo in the northern area of Tsavo West NP (outside Ngulia sanctuary). The single female rhino living on Kiagu Hill, Tharaka, Meru district, was found dead in 1991. There was no evidence of poaching and the horns were recovered. An attempt had been made to capture this animal early in 1991, and move it to a sanctuary. This was probably the last black rhino alive in Meru district.

In total there have been 113 confirmed rhino births against 19 deaths in the sanctuary areas in the last six years, thus an average of just over 5 per cent annual growth of these rhino populations over this time.

RHINO CONSERVATION AREAS

A summary of activities and developments

Lake Nakuru NP

Breeding success at Lake Nakuru NP has continued, with three black rhino calves born there in 1991. 'Suzie', a female rhino translocated to Lake Nakuru from Nairobi NP in 1990 gave birth to a female calf ('Kyela') in February. A male calf ('Mburugu') was born to a female originating from Solio ('Mwikali'). At the very end of the year, a female calf ('Zawadi') was born to 'Nduku', another female originating from Solio. This means that every female black rhino translocated to Lake Nakuru from Solio ranch (in 1987) has now had a calf, and one has produced two. Of the three females brought to Lake Nakuru from Nairobi NP, two young adults ('Njambi' and 'Judy') have still to produce calves. One young adult male ('Mwangi') died after it broke its leg when trapped between two fallen tree trunks in a dry river gulley.

No further doubts remain about the breeding potential for black rhinos at Lake Nakuru NP, which, if the habitat can be maintained, stands to duplicate the success of Solio and Nairobi NP as a highly successful rhino sanctuary; the increase of black rhinos at Lake Nakuru is beginning to repay the investment of many NGOs, the original Rhino Rescue Project of WCMD days, and in particular the planning work of Mr Peter Jenkins and others.

There are now 30 black rhinos at Lake Nakuru NP. The two white rhinos now resident in the National Park were observed mating in 1991 with a calf expected at the end of 1992. Typically the presence of two males is required to stimulate mating in white rhinos, so the mating of this single pair is unusual, but very welcome. Further translocation of white rhinos to Lake Nakuru from Solio is planned for 1992, in order to establish a good breeding nucleus; a total of ten were promised for Lake Nakuru NP by Mr Parfet in 1987.

WWF and EAWLS funded further developments and infrastructure in 1991: improvements to staff housing at Naishi; installation of a water pump at Lanet, which with the addition of a booster pump, tanks and piping, will provide water to the East side to the park in 1992; major

repairs to rhino sanctuary vehicles. The Sheffield University Rhino Group contributed funds and labour for construction of additional water tanks and troughs, and a drift.

Nairobi NP

Phase II of the Nairobi NP fence, funded by WCI, was completed by the KWS fence unit, and is now powered from mains electricity supply. The new fence is of a simpler 5-strand configuration, placed inside the overgrown chainlink fence on the West side of the park. The existing fence performed adequately, except for the section between East Gate and Carnivore.

The rhino surveillance team continued to provide detailed information on the black rhinos, including the births of three new calves. The presence of a further calf was confirmed, though this one had been born in 1990. One female ('Main Gate') died of natural causes (thought to be fighting), discovered during a translocation operation in May. The orphaned calf, named 'Seed', is now living at the Sheldrick orphanage. At the end of 1991, the total number of black rhinos in the park was 63.

One young adult male rhino ('Simon') was moved to Ngulia rhino sanctuary in May. A generally increased level of infighting was noted in the Nairobi NP rhino population, with injuries sustained by at least two males through fights, without need for treatment. Several rhinos are wandering out of the park, typically at night. These signs confirm that the rhinos are at, or approaching the carrying capacity of the park, and further rhinos will be moved out of Nairobi NP in 1992, at least to remove as many animals as are being born to the population at present. More studies are needed on the carrying capacity with respect to browse availability and habitat use by rhinos in the park, and two studies (1 PhD, 1 MSc) which may assist future management decisions commenced in the park at the end of 1991 (see Research).

Black rhinos continue to be a major attraction for visitors to Nairobi NP, where they can be virtually guaranteed viewing. The rhinos continue to receive support from Miss Kyela Leakey and her friends, who raised funds totalling KShs.130,850 for the rhino project in Nairobi NP.

Tsavo West NP (Ngulia rhino sanctuary)

AWF, EAWLS, Rhino Rescue Trust and the Eden Trust provided considerable funds necessary for the completion of infrastructure within the extension of the Ngulia rhino sanctuary from 20 to 75 sq km. This included fencing, staff housing and further water developments. The Sheldrick Wildlife Trust and AWF provided valuable assistance with the maintenance of the Ngulia fence, rhino surveillance vehicles and the water system. AWF funded the running costs of the Suzuki rhino surveillance vehicle, which was also used extensively on fence maintenance and patrols.

A second young male rhino ('Simon') was moved to Ngulia from Nairobi in May 1991, testing for resistance of translocated rhinos to trypanosomiasis infection from tsetse flies in the area. A collaborative research project with ICIPE is underway monitoring the fly species, densities, and tryps infections in the area and within the translocated rhinos. The results have been encouraging; both Nairobi NP animals moved to Ngulia so far have survived heavy

mixed infections of tryps, and have been released without need for treatment. At least a further six rhinos will be translocated to Ngulia from Nairobi in 1992, and will be monitored for two months in holding pens at Ngulia prior to release.

An incursion of a group of poachers was intercepted by sanctuary rangers in October 1991. There was no evidence of any poaching, or the presence of poachers within or near the rhino sanctuary at any other time. However there was a contact between poachers and Tsavo West NP rangers in Rhino Valley.

An effort is underway to identify and monitor the black rhinos in the sanctuary. Of the minimum number of 13 black rhinos believed to be inside the fence, 9 animals have already been identified in an area less than half the size of the total sanctuary area from 25 sightings up to the end of 1991. The minimum total of 13 rhinos in the sanctuary includes one unsexed calf born in early 1991. The monitoring work will continue in 1992 with further sightings from foot patrols, and photography of rhinos drinking at the three piped waterholes at night.

Requirements for the Ngulia sanctuary in 1992 include the provision of another section of rangers for security with their own transport, construction of an officer's house at the sanctuary HQ, and the provision of VHF radio equipment and surveillance equipment (e.g. binoculars). The security of the black rhinos living outside the rhino sanctuary in the Kamboyo, Muganga, Ndawe and Ngulia valley areas must also be improved, and an officer will be posted to take charge of security in these areas in 1992.

Aberdares NP (Salient)

The first phase of the sub-headquarters project at the northwestern end of the Salient was completed by the REME of the British Army. Phase II of the Aberdares fencing around the boundary of the Karameno triangle forest reserve commenced with line clearing of about 10 km over very difficult terrain, requiring major excavations of hillsides to support a level surface. Rhino Ark have continued their tremendous efforts in fundraising, coordinating the Phase II and the British Army work, and helping to maintain the completed Phase I fence.

With the provision of monitoring equipment in the form of camera equipment from EAWLS, binoculars and films, a combined team of Mr Ole Konchellah and Mr Mutwa identified 31 different rhinos at the Ark and Treetops during June-July, 1991. These officers have continued with the exercise, and by the end of the year 41 rhinos had been individually identified at the two lodges. Five new calves were recorded during 1991, and no deaths.

Given the above, a conservative total of 45 black rhinos in the Salient is assumed (Table 1), with an additional four rhinos resident in the northern Aberdares (Table 2). An accurate figure for the total number of black rhinos in the Aberdares cannot be stated, but is likely to be between 45 and 55 animals. There is clear evidence of good breeding, with mating and courtship recorded on several occasions. A complete census of the population will only come after at least another year of intensive monitoring of the Salient and surrounding areas.

With a likely total of at least 50 black rhinos in the Salient, and evidence of some rhinos moving out of the area, to avoid any fighting with residents it would be most prudent to

introduce more rhinos to the peripheral areas of the Salient, and allow the rhinos within the Salient to breed up to higher numbers as they clearly are now (Table 1: 20% calves). The area around the new sub-HQ, and within the Karameno area to be bounded by the Phase II fence are thought to be the most suitable areas for release of further rhinos (e.g. surplus from Solio ranch), though security must first be adequate for rhinos in the latter area.

Amboseli NP

On the 29th of September, three rhinos were speared and/or shot in the centre of Amboseli NP, being an adult female (Janet, most likely pregnant), her two year old male calf ('Tito'), and a young adult male ('Mukora'). The female died then and there, and the horns were removed by the poachers. The other two animals received serious wounds in their hind legs. Each animal was darted and treated for these wounds by KWS vet John Wambua and Senior Warden Sam Ngetha, the calf on one occasion and the adult male three times. Regular location of the wounded rhinos was difficult in the area of swamp they inhabited, no holding facilities were available, and the recovery of these animals after darning in the swamp would have been impossible.

Although treated, the male calf died from septicaemia on 17th October. The young male fared better, and the third treatment showed that some healing of its wound was taking place. However on 17th November, this animal also died after hitting one of the electric fences around Ol Tukai, and falling into the swamp on the side of its injured leg. It was unable to pull itself out and drowned. A post-mortem revealed that the injured leg contained several metal fragments which were collected for ballistic analysis, showing that this animal had in fact been shot. It was also clear that this animal would also have eventually died from septicaemia, as the leg wound was becoming gangrenous. The two Masai employed locally and paid by Eden Trust as rhino scouts obtained information sufficient for the arrest of four of the poachers.

After these deaths, there are now four rhinos remaining in the Amboseli area, of which two have moved into Tanzania on the slopes of Mt Kilimanjaro, probably for good. A single young adult female remains inside the park, and is believed to be pregnant. The final rhino is the large adult male ('Mkuki'), who wanders widely in and out of the park.

For political considerations, it has been decided to leave these animals in Amboseli, in spite of the fact that they have no future there, and, from all biological considerations, should be moved to another rhino conservation area. In the view of the writer no further re-introductions of rhinos can seriously be contemplated until security can be guaranteed in Amboseli and the surrounding areas, and the habitat has recovered sufficiently for the species to thrive.

The remaining Amboseli rhinos are valuable genetically, and could form part of a future re-introduction of the species to Amboseli when conditions are suitable. When and if this were undertaken, the re-introduction should be done with sufficient numbers (minimum founder population of 20 rhinos) to guarantee some future prospect of long-term viability for the population, independent of adequate security being provided.

If viewing value and community relations are the only considerations that remain at present

for rhinos at Amboseli, the park could be stocked only with surplus males from the sanctuaries.

Masai Mara NR - Loita Hills

In spite of generally less than adequate levels of security in the Masai Mara NR and surrounding areas, the Mara black rhino population has continued to increase rapidly in numbers (Table 1: 27% calves), with three more calves born in 1991. With the identification of some new animals within the reserve, the total number resident there now stands at 30. From matings observed in 1990-1, 6 more calves are expected to be born in the reserve in 1992.

The FOC-funded rhino surveillance work under Mr D Round-Turner has continued to provide very detailed records of the Masai Mara NR rhinos, and additional information on the nearby population in the Loita Hills, which is estimated to number 14 individuals. There is at least one rhino that is known to have moved between the Mara and Loita populations.

With adequate security the Mara rhino population must continue to grow. Ideally there will soon be some migration of rhinos across the Talek to re-colonise some of the thickets North of the river (and satisfy the demand for rhino-viewing in the Musiara area). The single subadult female living North of the river ('Naishuru') did cross the river to the South in October and stayed there one week. It is hoped that she will regain contact with the other Mara rhinos with future excursions; as she is only just 4 years old, there is little prospect of her breeding for at least another two years, in which time she may have moved South, or perhaps other rhinos will have moved North. For now there is no need to move another rhino to her area specifically for her own company. However a larger re-stocking exercise for some areas of the Mara with black rhino may be contemplated in the future.

In the Loita Hills, there is some evidence of breeding taking place with at least one calf born in the last two years. Although the employment of rhino scouts by FOC and the Eden Trust in the area has been an undoubted success, particularly for relations and 'ownership' of these rhinos by the community, more information is needed, particularly in order to establish the age structure, sex ratio and breeding prospects of these rhinos. Ideally sufficient information would be forthcoming to detect all calves born at an early stage, establish the movements of some individual rhinos and how cohesive the total number of rhino in this population is.

Kitchich (Mathews Range-Karissia Hills-Southern Nderets)

The rhino surveillance team in Kitchich, under the unit leader Mr Michael Lenaimado are slowly building up an identification file of the black rhinos in the area. In addition to the estimated 14 rhinos in the Mathews range, 3-4 rhinos have been monitored in the southern Nderets at Keno, including a female and calf, and one adult bull that wanders very widely in this area. The rhino team, largely financed by Eden Trust, continues to monitor an isolated group of 6 rhino on the East side of the Karissia Hills, as well as the rhinos in the Mathews range.

Mr Mulwa spent one month at Kitchich assisting Mr Lenaimado with the rhino monitoring work in October/November. They confirmed that nine individual rhinos live close to the Kitchich station, with a further five at Ngare Narak at the north end of the Mathews range (including one calf). How much movement there is of rhinos between these two areas is not clear.

The staff at Kitchich, consisting of 7 KWS rangers, 8 armed subordinate staff, 5 Eden Trust rhino scouts, and a driver, are well motivated, operate in difficult conditions and would benefit from more attention and encouragement. Continued efforts to improve security and intelligence gathering through strengthening this station are required, together with a build-up of knowledge of the black rhinos in the area.

Private Land

The private sector rhino sanctuaries continued to play an essential role in conserving black and white rhinos in Kenya. 134 black rhinos (about a third of the Kenya total) and all but two of the country's white rhinos were located on private land at the end of 1991. Eleven black rhino births were recorded on private land during 1991, one of which died soon after birth on OI Jogi.

Rapid breeding continues on Solio Range (62 black rhinos, 50 white), which can continue to supply surplus black and white rhinos to other rhino sanctuaries. Six black rhinos were born on Solio in 1991. An extension of at least 15 sq km to the Solio reserve was opened, containing almost continuous ideal rhino habitat. It is hoped that this area will absorb some of the black rhino population from the main reserve in 1992, and take some pressure off the rhino browse, in addition to the effects of planned translocations of rhinos out of the reserve in 1992.

Although two black rhinos were born in 1991, Lewa Downs (Ngare Sergoi) rhino sanctuary experienced a year of calamities, including the deaths of four black rhinos. In May, two adult males fell to their deaths over a 15 ft rock after fighting at the top; these included a fine breeding bull ('Sopat') moved to Lewa from Solio in 1990, and a young adult male ('Kikwar') which had been captured in a very expensive operation North East of the Mathews range in late 1989. In September, an old non-pregnant female ('Rongai') also fell over a cliff after losing her footing on a steep slope above.

In order to provide a breeding male for Lewa Downs and to remove any possibility of further fighting between males in the sanctuary, the KWS unit and Dr Rottecher carried out three translocations. A large breeding bull ('OI Bayun') was moved to Lewa from OI Pejeta in August, in exchange for a subadult male bred on OI Pejeta ('Jupiter'). Another young adult male ('Kelele') was moved out of the sanctuary onto OI Pejeta, castrated, dehorned experimentally for its own security, and in order to save space. The horns of this animal outside. However in October the new breeding bull died following a blockage after immobilisation; the oesophagus appears to have been paralysed following wounds received by this animal during an earlier fight with another male on OI Pejeta. The result is that at the end of the year there was no adult male inside the Lewa Downs rhino sanctuary, although the young adult male moved out showed signs of his potency when one of his matings resulted

in a calf born towards the end of 1991.

The drought susceptibility of the Lewa Downs sanctuary has been recognised. All but fifteen of the giraffe were moved out of the rhino sanctuary, resulting in a dramatic improvement in the browse, even before rains fell. However in order to make the sanctuary rhino population viable for the future, more habitat needs to be made available for the Lewa rhinos, both black and white, and the ranch is making sensible plans to fence the entire ranch, take down the internal sanctuary fence, and allow black and white rhinos to colonise the rest of the ranch area. Security and monitoring work continues to be of a very high standard.

Ol Pejeta ranch had nine black rhinos at the end of 1991, including the celibate ex-orphan adult male 'Morani', who lives in his own separate enclosure. One black rhino calf was born to a female which had arrived pregnant from Solio in 1990, and a subadult female was killed in a fight, suspected to be with an adult male. Ol Pejeta needs to receive a further 12 black rhinos to complete its stocking, presently planned to comprise 8 rhinos from Solio and 4 from Nairobi NP to be moved in 1992. The removal of most of the elephants from the sanctuary is a condition for receiving further rhinos.

One rhino calf was born on Laikipia Ranching (Ol Ari Nyiro ranch), but as in the past few years breeding output is low and several rhinos have wandered off the ranch to the North, West and possibly, the East. Four rhinos were resident in the North part of Luoniak ranch at the end of the year, including a cow and calf. There is still a need for barriers to contain the rhinos within the ranch, and a thorough resurvey of the rhino population and assessment of its conservation needs, which appears to be in danger of fragmenting as the rhinos disperse.

Ol Jogi ranch contained 11 rhinos at the end of 1991, with one calf born which died soon after birth for unknown reasons. Due to the drought susceptibility of the ranch, the extreme over-utilisation by herbivores in general, especially grazers, and general lack of management directed at maintaining habitat, there is continuing concern about the viability of this reserve as a rhino sanctuary. The lowered breeding output from the rhino population compared with former years may have been influenced by deterioration of the habitat.

COMMITTEES

The Rhino Project and KWS Director continued to be advised by three rhino project committees, the composition and objectives of which are outlined in Appendix I. In 1991, there were 4 meetings of the National Management Committee, 2 meetings of the National Forum Committee, and 3 meetings of the Association of Private Land Rhino Sanctuaries, all minuted.

RHINO CAPTURE UNIT & TRANSLOCATIONS

Although hampered for most of the year through lack of a competent rhino veterinarian based at KWS to carry out rhino translocations, the rhino capture unit performed three translocations of black rhino between rhino sanctuaries in 1991. Dr Jonyo carried out the immobilisation of a young adult male ('Simon') in Nairobi NP in May. This animal was moved to the Ngulia

rhino sanctuary in Tsavo, where it was held for 8 weeks monitoring for trypan infection (see Research: Disease) in a holding pen prior to release. With Dr Rutter as vet, an adult breeding male ('Ol Bayann') was moved from Ol Pejeta to Lewa Downs in August, and a young adult male ('Jupiter') was moved from Lewa to Ol Pejeta in exchange. To accommodate the new breeding bull at Lewa, the other young adult bull ('Kelele') in the Lewa sanctuary was moved outside onto the main ranch, and dehorned. This animal has established itself successfully on the periphery of the sanctuary area.

The capture unit continued to experience problems with the two capture lorries, due to poor maintenance and requisition of these lorries for other duties by other KWS departments. A third capture lorry (GK C535) fitted with a crane had still not left the Nairobi central workshop at the end of the year, and had still not been inspected and licensed.

RESEARCH

Rhino Population and Vegetation Monitoring

Daily monitoring of black rhino populations continued in the rhino sanctuaries, with detailed sightings records compiled in Nairobi NP, Lake Nakuru NP, Aberdares NP (Ark, Treetops), Tsavo West NP, Masai Mara NR, Ol Pejeta ranch, Laikipia ranching, the Lewa Downs rhino sanctuary, Kitchich (Ngeng Valley) and Mt Kenya NP (Mountain Lodge). Although sightings records were not taken routinely in other areas (e.g. Solio ranch), sufficient information was provided by ranch managers and/or visits from rhino project staff made to obtain data necessary for adequate update of census through records of all deaths and rhino calves born, and assessment of breeding performance (Table 1).

Information received from other areas was scanty (Table 2), and not complete enough for sex ratios and age structures to be calculated. Priority areas for complete census of black rhinos are Laikipia ranching, Aberdares NP, the Matthews range and the Loita Hills. All sightings records, patrol reports, deaths and translocations during 1991 were recorded in standardised rhino project record books, the production of which was funded by the Eden Trust in 1989.

For many areas, particularly those enclosed by fencing, ecological monitoring of the browse levels available for rhinos, and the influence of other competing herbivores is required in order to give improved estimates of carrying capacities and management levels for rhinos. Mr Fred Waweru is commencing such long term data collection in Lake Nakuru NP, and it is hoped that he will develop vegetation monitoring programs for most major rhino conservation areas.

Joseph Ngene, an Oxford graduate, started a PhD study of the ecology and habitat use of black rhinos in Nairobi NP, sponsored by Guinness PLC. It is hoped that his two-year study will lead to improved knowledge of the carrying capacity of the park for rhinos, and hence assist decisions on levels of 'harvesting' surplus rhinos from the park to move to other conservation areas.

Black Rhino Population and Habitat Viability Workshop (PHVA)

Between 2nd and 5th November, a workshop was convened and directed by representatives of the IUCN Captive Breeding Specialist Group, with the objective of assessing the current Kenya rhino conservation plan and the viability of individual rhino populations; also, through the use of computer simulations, to delineate a metapopulation strategy whereby all the rhino populations would be managed interactively in order to maintain the genetic diversity and demographic stability of each in the long term.

The following persons attended: Richard Leakey, Evelyn Wanjohi, Jim Else, Fred Waweru, Tim Olco, Rob Brett, Sam Ngethe, John Kagwi, Pius Mulwa, Mark Stanley Price, Chris Gakahu, Rashid Aman, Esmond Bradley Martin, Holly Dublin, Rob Eley, Steve Mihok, Kuki Gallmann, Ulie Seal, Tom Foese, Bob Lacy, Richard Koek, Raoul Du Toit, Ollie Ryder, Kes Hillman-Smith, Richard Emslie.

The initial results of the computer simulations, including remarks about the viability of several important rhino populations in Kenya, are attached in Appendix III of this report.

Genetic studies

Further blood and tissue samples were collected from rhinos immobilised for translocation and treatment, and provided to the Genetics Department of the National Museums of Kenya (under Dr Rashid Aman) for their ongoing studies of levels of genetic variation between black rhino populations, and the development of techniques of DNA fingerprinting for determination of degrees of relatedness of rhinos within populations. Preliminary results are awaited.

Disease

Studies continued on the infection of black rhinos moved from Nairobi NP to Ngulia rhino sanctuary with trypanosomiasis, carried by tsetse flies, in collaboration with scientists from ICIPE and KARI. The young male rhino moved to Ngulia in May was held in a pen for eight weeks' monitoring, with blood samples collected at two-week intervals. During this period (end of rainy season) the density of tsetse flies and the infection rates of tryps were both high. However the browse quality was good, so that it was possible to keep the animal in good condition in the pen. Despite receiving a heavy mixed infection of tryps during its time in the pen, this animal became resistant to the disease without need for treatment. It was released on schedule, and is still living in the region of the pens where it was held.

The results so far are encouraging, and indicate that it is possible to move black rhinos to tsetse fly/tryps areas without treatment, so long as the animals are maintained in sufficiently good condition to withstand the infection. This means that the best time for moving rhinos to these areas is probably some time between wet and dry seasons, when there is sufficient browse to feed the animals well, but the fly densities and infection rates are intermediate so that the rhinos are gradually introduced to the disease. A further 10 rhinos will be moved from Nairobi NP to Ngulia during 1992-3, and each will be monitored in pens prior to release in the same manner as for the first two rhinos moved in 1990-1.

In addition to the tryps monitoring at Ngulia, Anne Waweru commenced a MSc study of the endoparasites of black rhinos in Nairobi NP, and in particular of the rhinos translocated from Nairobi to the Ngulia rhino sanctuary. The parasite loads of black rhinos may show some relationship with rhino density and well as general health, and the quantity and species of parasites detected in rhino dung could assist assessment of carrying capacities as well as vegetation monitoring and studies of habitat use. There also exist some very interesting large bot fly species (e.g. *Gyrostigma* sp.) whose larvae are only found within the stomachs of black rhinos; these species may well have gone extinct in all but the last remaining rhino sanctuaries with high rhino densities (e.g. Sofio ranch, Nairobi NP).

ACKNOWLEDGEMENTS

The KWS rhino project is grateful for the support of the several NGOs committed to rhino conservation in Kenya, in particular WWF, AWF, ICIPE, FAWLS, ZSL, WCI, the David Sheidrick Wildlife Trust, the Rhino Ark and the Eden Trust. The cooperation and advice of several representatives of the private land sanctuaries are appreciated, as is the cooperation of wardens in charge of National Parks which contain, or are themselves, rhino sanctuaries.

APPENDIX I**KENYA RHINO PROJECT COMMITTEES****A. National Management Committee (NMC)**

Established in March 1988; 18 meetings have been held up to the end of 1991.

Membership during 1991 (KWS staff, unless stated otherwise)

Dr R E Leakey	Chairman	Director
Dr R A Brett	Secretary	Rhino Project Coordinator
Mr J M Kioko		Deputy Director Wildlife Services
Dr J G Else		Deputy Director Scientific Services
Mr S M Ngethe		Senior Warden, KWS HQ
Ms E Wangjohi		Rhino Project
Mr J W Kagiri		Fence Unit
Dr J F Jonyo		Veterinary Officer
Mr T Oloo		Nairobi NP
Mr D ole Konchella		Aberdares NP
Mr J Kagwi		Lake Nakuru NP
Mr R O Kech		Tsavo West NP
Mr F K Waweru		Ecological Monitoring Unit
Dr D Rotcher		Veterinary Officer
Mr P R Jenkins		Former RPC
Mr E C Goss		Eden Trust
Dr M R Stanley Price		AWF
Dr C Gakahu		WCI
Dr H Dublin		WWF

The Wardens of Nairobi NP, Lake Nakuru NP and Tsavo West NP also attended.

Terms of Reference:

- i. Management Policy & Techniques:
 - All Management & Security matters
 - Captures, Translocations & Veterinary matters
 - Rhino population surveys
 - Monitoring & Data collection
 - Monitoring population densities & trends
 - Habitat studies & management
 - Interaction with other species
- ii. Management of all rhino conservation areas
- iii. Funding: priorities for funding requirements
 - a. Advise donors of these
 - b. Monitor funding, expenditure and effectiveness

- iv. Research studies
 - a. Coordinate & monitor all studies
 - b. Review requests for any new studies
- v. Rhino sanctuaries
 - a. Assess priority areas for rhino conservation
 - b. Consider new areas, and advise where necessary
- vi. Publication of KWS rhino policy/strategy documents

B. National Forum Committee (NFC)

Established in March 1988; 10 meetings have been held up to end of 1991.

Membership during 1991:

Dr R E Leakey	Chairman	Director, KWS
Dr R A Brett	Secretary	Rhino Project Coordinator, KWS
Mr J M Kioko		Deputy Director Wildlife Services, KWS
Ms E Wangjohi		Rhino Project, KWS
Ms A Cunningham Reid		International Office, KWS
Ms C Maina		International Office, KWS
Mr K Kuhle		Rhino Ark
Mrs D Sheldrick		David Sheldrick Wildlife Trust
Mrs K Gallmann		Gallmann Memorial Foundation
Mr E C Goss		Eden Trust
Mr N K arap Rotich		EAWLS
Mr E Wilson		WWF
Dr D Western		WCI
Dr M Stanley Price		AWF
Ms H De Butts		FOC
Dr E Bradley Martin		AERSG

Terms of Reference:

- i. Funding
 - a. Capital costs of construction for infrastructure in new and existing rhino sanctuaries
 - b. Recurrent costs: assistance with annual operating costs where necessary
 - c. Vehicles & Equipment: new & refurbished; maintenance
 - d. Capture & translocation of rhinos