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**GAME DEPARTMENT
ANNUAL REPORT
1961**

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ANNUAL REPORT
1961**

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GAME DEPARTMENT ANNUAL REPORT, 1961

PART I—STAFF AND GENERAL

The year started with the enforced closing of the Game Department stations at Thomson's Falls, Embu and Voi, as a result of financial cuts, and this was followed by the withholding of certain funds voted for the second half of the 1960-61 financial year and a further reduction of funds for the year 1961-62. The Game Department was consequently in no position to face up to the various emergency situations which arose from the "worst drought for 50 years", combined with a country-wide invasion of army worm, being succeeded by the "worst floods in living memory". Such freak climatic conditions, with a consequent high death rate in game in many districts and unprecedented movements in search of grazing and water, posed new problems both of conservation and control.

As usual, tribute must be paid to the enormous help given to the Department by its Honorary Game Wardens, particularly those who assisted in control measures and in active patrolling, to whom the debt is increased by the fact that this year's financial stringency made it impossible to reimburse their out-of-pocket expenses.

The close co-operation and assistance of such bodies and individuals as the East African Professional Hunters' Association, the Trustees and staff of the Royal National Parks and the Coryndon Museum, the East African Tourist Travel Association, various District Agricultural Committees and the East African Wild Life Society, must also be recorded with thanks.

The last named body changed its name from the Kenya to the East African Wild Life Society in the latter part of the year and its contributions to conservation have included such concrete items as help in providing an assistant for the Game Department team working on the capture of rhinoceros, the starting of its own capture team to deal with other animals under the direction of the Game Department and the making available of an aeroplane for the free use of any East African Game Department or National Parks organization.

Staff changes within the Department were minimal but the year saw the retirement of Mr. G. A. G. Adamson, M.B.E., Senior Game Warden, who had spent 22 years in the Department, all of them in the Northern Frontier District, for which he had been responsible single-handed except for the last two years.

One other Warden was retrenched as a result of financial cuts at the beginning of the year and another resigned.

The vacant post of biologist was filled by Mr. A. D. Graham but that officer had to be used on normal Game Warden duties to avoid closing down a fourth station.

Field dispositions as at 31st December are shown in Appendix A.

The granting of independence to many former African colonies and the steady advance of others towards that goal focused world attention on the future of wild life throughout the continent. As Stage I of the International Union for Conservation of Nature—African Special Project, Kenya received a visit from Dr. G. G. Watterson, at that time Secretary-General designate of that body, who took with him to the Central African Federation on the next stage of his

journey Mr. Ole Tipis, Warden of the Masai Mara Game Reserve and Mr. Ole Sein of the Kajiado African District Council Game Committee which is responsible for running the Masai Amboseli Game Reserve and the Chyulu and Kitengela Game Conservation Areas. Though the season did not allow of their visiting any of the major national parks or game reserves they undoubtedly benefited from this visit.

Stage II of the African Special Project took the form of a Symposium on the Conservation of Nature and Natural Resources in Modern African States, held under the joint auspices of I.U.C.N. and C.C.T.A. at Arusha from 5th to 12th September and attended by representatives from over 20 African territories as well as those from Britain, Belgium, France, Germany, Sweden and the United States of America.

It was unfortunate that none of Kenya's political leaders were able to attend because of political discussions at Government House but representatives of the two Masai African District Councils (Mr. Ole Tipis of Narok and Mr. John Maturi of Kajiado) as well as the Chief Game Warden and the Fauna Research Officer were included in Kenya's delegation.

The Arusha symposium was preceded in May by a technical conference called by Dr. E. W. Russell, Director of East African Agriculture and Forestry Research Organization on Land Management Problems in Areas Containing Game, which was attended by the Chief Game Warden, the Fauna Research Officer, the Senior Game Warden, Narok, and the Game Warden, Kajiado.

Further evidence of growing world interest in the wild life of Africa and the realization of its economic potential was the formal acceptance by F.A.O. of matters appertaining thereto as coming within its portfolio.

That body has now set up a working party to prepare a new Charter for Wild Life for acceptance by, it is hoped, all African countries. The Chief Game Warden represents Kenya on the working party.

The year saw the publication of two reports, the outcome of visits of investigation by leading scientists during 1960; the one being Sir Julian Huxley's report to UNESCO entitled "The Conservation of Wild Life and Natural Habitats in Central and East Africa" and the other, Dr. E. B. Worthington's "The Wild Resources of East and Central Africa".

PART II—CONSERVATION AND EXPLOITATION

A—National Reserves

The Trustees of the Royal National Parks relinquished their rights over the greater part of the Marsabit National Reserve on 1st January, 1961, and over the Amboseli, West Chyulu, Ngong and Mara National Reserves on 1st July.

National Reserve status was retained for an 800 square-mile area surrounding Mount Marsabit and a 270 square-mile area on the Uaso Nyiro River so as to allow control to remain in the hands of the Trustees while negotiations continue over the setting up of the smaller National Parks-to-be they contain. The remainder of the Marsabit National Reserve became a controlled area, as did the other National Reserves mentioned, and by the passage of African District Council By-laws the Masai Mara Game Reserve and the Masai Amboseli Game Reserve together with the West Chyulu and Kitengela Game Conservation Areas came into being within them.

B—Exploitation Based on Viewing and Photographing Game in African District Council Game Reserves—General

Such reserves have the legal status of Controlled Areas under the Wild Animals Protection Ordinance and are governed by a combination of the regulations applying to such areas with by-laws passed by the African District Council concerned.

Broadly speaking Controlled Area regulations cover faunal matters while the entry and conduct of visitors and such matters as cultivation, the grazing of stock and the firing or causing of other damage to vegetation are controlled by African District Council by-laws.

The combination gives as much control of the fauna and its environment as is available to the Trustees in National Parks, though it is not always so strictly applied, since grazing is permitted in some areas of some reserves.

The system allows local authorities to assume responsibility for the proper exploitation of game within selected regions of their own land and to derive the prestige and profit arising therefrom.

The staff they employ enforces the Wild Animals Protection Ordinance by virtue of honorary rank in the Game Department and African District Council by-laws by virtue of being servants of that body.

In July a special booking office to cater for visitors to these Reserves was opened at Game Department headquarters. This office is linked to the two Reserves with lodge accommodation (Amboseli and Meru) by radio-telephones.

Application has been made for the Meru, Mara and Amboseli Reserves to be included in the United Nations list of National Parks and Equivalent Reserves.

MERU AFRICAN DISTRICT COUNCIL GAME RESERVE

The rather disappointing progress made by this, the first of all African District Council Game Reserves, in terms of the number of visitors it attracted is due to a combination of circumstances. First it lies in a remote area previously unknown to visitors and has consequently been slow to get on the map. Secondly, until July, when the Game Department office opened, means of giving it publicity have been limited and there has been no place in Nairobi where information could be obtained and visits arranged. Lastly, owing to shortage of funds, development of facilities has been slow.

Nevertheless there is no doubting the quality of what the Reserve has to offer and those who have visited it have been wholly satisfied with what they saw.

It is unfortunate that early and unprecedented rain closed the Reserve to all entry almost as soon as the small lodge was completed and kept it closed until the end of the year. Only a score of people visited the Reserve during the course of the year.

In October the firm of Messrs. Ker and Downey made the generous gift of a 3-ton lorry to the African District Council for use in the Reserve, in recognition of its efforts towards the conservation of wild life.

THE MASAI MARA GAME RESERVE

As stated in the 1960 Annual Report this Reserve consists of a 200-square-mile area between the Talek and Mara rivers from which livestock is totally excluded and in which all human activities are controlled, surrounded by a further 500 square miles in which cattle are allowed to pasture, though the destruction of vegetation by burning is prohibited.

Plans for the area are the construction of a visitor's lodge and the development of the inner area along traditional National Park lines, while the outer zone is to be kept as a series of exclusive camping blocks for the use of photographers only.

Construction of the 20-bed lodge at Egelok Spring was started in October but early rains put a stop to work before the buildings were much above foundation level. Subsequent floods soon isolated the workers, who were evacuated with some difficulty.

Before the rains started roads were completed linking Egelok with Narok and with the road leading north from Seronera Camp in the Serengeti National Park. In future visitors will therefore be able to complete a circular trip taking in Amboseli, the Ngurdoto Crater, Lake Manyara and Serengeti National Parks of Tanganyika, the Ngorongoro Crater and the Mara Reserve.

Pending completion of the lodge, camping is permitted throughout the Reserve, eight parties being allowed in at one time. There were 667 visitors in 1961 from whom the African District Council received Sh. 37,100 in fees. Of these 262 made their visit before 1st July when the Reserve came into official being and therefore paid only the Controlled Area photographic fee of Sh. 10 per head irrespective of the duration of stay.

A camera team of the 20th Century-Fox Film Company spent several weeks in the Reserve obtaining animal shots for the film *The Lion*. Unfortunately their arrival coincided with the onset of the rains, which greatly handicapped their operations.

Drought conditions in the first part of the year affected the Mara region as well as elsewhere but since the vegetative cover had been less damaged by years of overgrazing, deaths amongst livestock were fewer and no casualties were recorded amongst game. Though cattle, sheep and goats crowded into the area from the surrounding affected regions it is pleasing to record that at no time was the inner sanctuary violated.

In December the African District Council received a generous grant of £2,000 from the Trustees of the Royal National Parks to enable water supplies to be developed for game in the inner sanctuary.

THE MASAI AMBOSELI GAME RESERVE

This Reserve came into official being on 1st July and a short ceremony was held at Ol' Tukai on the 14th of that month at which the responsibilities which had been surrendered by the Trustees were formally entrusted to the African District Council by H.E. the Governor.

The visitors' lodge built by the Trustees and all installations were taken over by the African District Council and the staff accepted transfer to new employment *en bloc*.

The number of visitors remained at the former high level, a total of 5,668 paying for admission between 1st July and 1st November when the Reserve was closed for the rainy season. Of these 1,200 were accommodated at Ol' Tukai lodge and 170 at camping sites, while the remainder made day visits. Total lodge and entry fees amounted to Sh. 58,885. Flood conditions prevented reopening before the end of the year.

Amboseli, having been badly damaged by severe over-use by cattle for many years, suffered seriously during the drought. Many thousands of cattle and a large number of zebra, wildebeeste and kongoni died of starvation. The ensuing torrential rains did little but good, for, though communications were cut and the Masai who congregated there had to be fed by air drops, grass revived again

wherever roots remained and much of the rest of the land was covered with a green flush, albeit only of weeds. The soil, even where unprotected by cover of any sort, showed remarkable resistance to erosion and the damage from wash was far less than could have been expected. Visitors to the Reserve have now the pleasure of seeing Amboseli lake full from bank to bank, a sight believed to be unprecedented in historical times.

One unfortunate consequence of the famine conditions which prevailed amongst the Masai, consequent on the loss of their stock, was the great increase in the spearing of rhinoceros for the value of their horns which occurred throughout Kajiado District. Amboseli was not free from this unwelcome development and of the 40 of these animals known to have been killed 11 were speared in the Reserve, three of them after it had been handed over to local control. The African District Council reacted sharply and proved diligent in tracking down and bringing to justice the offenders. Punishing the guilty ones is not enough, however, and until the Masai can bring their own members to a sense of the folly of such action, and of the harm they are doing to themselves, the future of the Reserve will remain in doubt.

At the end of the year the Game Committee of the African District Council were giving serious consideration to the possibility of creating an inner sanctuary, as in the Mara Reserve, by excluding all stock from a 200-square-mile area surrounding the swamps. If this can be done it will not only demonstrate the seriousness with which the African District Council has undoubtedly accepted its responsibilities but it will remove the greatest threat to the wild animals inhabiting the Reserve; that of the ultimate total destruction of all grazing and the denial of the shelter of the swamps.

THE WEST CHYULU AND KITENGELA GAME CONSERVATION AREAS

These areas were not set aside for immediate exploitation by the African District Council but to preserve necessary adjuncts to neighbouring national parks.

The by-laws governing them, which prohibit agriculture, the enclosure of land or the burning of vegetation, are sufficient for that purpose since grazing is kept to a minimum by tsetse fly in the Chyulu and East Coast fever in the Kitengela area.

The West Chyulu Game Conservation Area covers the western slopes of the Chyulu range, the eastern slopes of which are scheduled to be added to the Tsavo Royal National Park. The Kitengela Game Conservation Area covers the area to the south of the Nairobi Royal National Park vital to the needs of its migratory game.

During the drought period the West Chyulu region was threatened by Wakamba squatters who moved up illegally on to the eastern slopes of the hills and started cultivating *shambas*. Though these kept mainly to that side a second wave of Wataita and Kikuyu who had been expelled from Tanganyika settled on the western slopes and had not been removed by the end of the year.

OTHER CONTROLLED AREAS

Block 61 (the Mara area) remained the most popular photographic area up to its becoming the Masai Mara Game Reserve on 1st July. Only 19 other exclusively photographic Controlled Area Permits were taken out and most of these were for the Samburu District.

Photographers as well as hunters made use of the pony and camel transport made available for hire by the African District Council.

MOUNT KENYA GAME LODGE

This lookout, which can accommodate 24 visitors and is built on the lines of the famous Treetops, has been constructed over a waterhole in the forest above Nanyuki and is run as an adjunct to the Sportsmans Arms Hotel. It was opened by H.E. the Governor on 17th August. Though game was slow to recover from the disturbance caused by building it is reported as being seen more frequently in recent months.

C—Exploitation by Hunting

Despite unsettled political conditions the number of visiting hunters was slightly higher than in the previous two years, although outfitting firms report a general falling off in bookings for 1962.

Some good trophies were obtained, notably an elephant shot in Block 29 which carried tusks weighing 171 and 163 pounds.

A new licensing office was opened at Game Department Headquarters which greatly facilitated the issue of licences and permits.

No change in fees were made other than increases in the Controlled Area fees paid for elephants, which were graduated according to the weight of tusks gained. A forfeitable booking deposit for Controlled Area blocks was also introduced to eliminate speculative bookings.

The Mount Kenya and Aberdare forests which had previously formed two single units were split into six and three blocks respectively, to enable rhinoceros to be completely protected in certain areas and to give better control of the hunting of them elsewhere.

Of the hunting blocks opened in the former Marsabit National Reserve four (Nos. 53, 53B, 54 and 54B) are reserved for foot *safaris* only. Only two of the four are open at any one time and having established their base camp at a pre-determined spot hunters must thence forward proceed on foot or with pony and camel transport which can be hired from the African District Council.

As these blocks cover some of the most beautiful scenery in Kenya with every transition from almost pure desert to high mountain forest, and as they are well stocked with game, it is not surprising that this form of hunting is creating its own band of enthusiasts. Like all innovations the idea received a mixed reception and was slow to take on, but by the end of the year 38 hunters had made the experiment and some of them at least have sworn that they will not revert to more orthodox methods.

The fact that Kenya still allows the hunting of rhinoceros despite world-wide concern about its present status is often the cause of comment. This animal is however now protected in all blocks except for six in which increasing agricultural settlement and the intensity of poaching means that it is doomed, and in five of the mountain forest blocks where absolute control of numbers is possible. If rhinoceros are to disappear from areas in the former category it seems logical that they should be taken by the hunter who brings revenue to the country rather than fall victim to the poacher's poisoned arrow; the more so when the presence of the hunter slows down the process of elimination by keeping the poacher, if not out of the field, at least under some sort of restraint.

The total revenue from game licences (including £1,445 fees for Chief Game Warden's permits) was £44,806. Controlled Area fees paid to African District Councils amounted to £5,854.

Table 1 shows the number of game licences issued by categories compared with those issued in 1960.

Table 2 shows the number of game animals shot on licence in Controlled Areas. It is emphasized that this table does not take into account animals shot on private land, for which no figures are available.

Table 3 shows the allocation of Controlled Area fees by district.

A total of 83 professional hunters were licensed to operate in Kenya during 1961.

TABLE 1—NUMBER OF LICENCES ISSUED—1961

Type of Licence	1960			1961		
	Visitors	Residents	Total	Visitors	Residents	Total
Full	163	478	641	205	517	722
14-day	20	28	48	18	17	35
Private Land	35	131	166	25	148	173
Bird	—	—	366	—	—	803
Employees	—	—	—	—	1	1
<i>Special Licences—</i>						
1st Elephant	137	49	186	148	29	177
2nd Elephant	23	13	36	22	9	31
Rhinoceros	102	12	114	100	11	111
Masai Lion	63	5	68	71	3	74
Non-Masai Lion	41	11	52	44	29	73
Leopard	128	6	134	148	6	154
Hippopotamus	1	—	1	—	—	—
Buffalo	417	332	749	446	387	833
Grevy's Zebra	63	5	68	90	4	94
Bongo	19	11	30	25	16	41
Eland	115	31	146	131	37	168
Greater Kudu	15	5	20	8	3	11
Hunter's Antelope	20	2	22	31	1	32
Blue Monkey	4	—	4	—	—	—
Ostrich	28	12	40	52	7	59

TABLE 2—GAME ANIMALS SHOT ON LICENCE—CONTROLLED AREAS ONLY—1961

Species	1960	1961	Species	1960	1961
Elephant	180	189	Wildebeest	104	76
Rhinoceros	100	86	Klipspringer	17	12
Burchell's Zebra	598	400	Oribi	26	17
Grevy's Zebra	50	64	Steinbuck	27	25
Bongo	2	5	Dik-dik	121	119
Buffalo	180	207	Impala	326	381
Greater Kudu	14	—	Gerenuk	110	121
Lesser Kudu	69	93	Thomson's Gazelle	229	208
Bushbuck	76	70	Grant's Gazelle	282	247
Eland	65	68	Wart Hog	118	113
Duiker	36	15	Giant Forest Hog	8	10
Waterbuck (both species)	138	123	Giraffe	2	—
Reedbuck (all species)	34	25	Lion (Masai)	27	14
Oryx (both species)	159	163	Lion (other)	18	67
Topi	47	53	Leopard	72	81
Hunter's Antelope	12	10	Crocodile	37	—
Coke's Hartebeeste	238	138	Ostrich	26	48

TABLE 3—CONTROLLED AREA FEES PAID—1961

<i>District</i>	<i>Fees Paid</i>
	<i>Sh.</i>
Kajiado	22,180
Narok	26,815
Kilifi	2,095
Isiolo	7,500
Garissa	9,420
Tana River	4,425
Baringo	305
Kapenguria	235
Machakos	12,995
Taita	8,115
Meru	600
Embu	2,140
Kitui	4,455
Kwale	2,130
Lamu	1,035
Elgeyo-Marakwet	170
Nanyuki	2,155
Maralal (Samburu)	5,450
Marsabit	440
Lodwar (Turkana)	70
Galana River Game Management Scheme	2,315
Forest Areas	2,035
Total ..	Sh. <u>117,080</u>

D—Exploitation by Harvesting for Hides, Meat, etc.

GALANA RIVER GAME MANAGEMENT SCHEME

Unfortunately this scheme cannot yet be said to be fully established and at least a further year will be necessary before its true potential can be assessed.

Difficulty has been experienced in both shooting the desired number of elephants and in disposing of their products, and neither problem had been wholly solved by the end of the year.

Contributory causes to the lack of hunting success were the unusually heavy rains, which stopped all hunting and made the drying of meat impossible during part of July and the whole of October, November and December, and the lack of a second Warden.

Initially, during part of the 1960-61 financial year, which ended on 30th June, the latter handicap was due to staff shortages making it impossible to keep the scheme up to its full establishment of two Wardens.

As noted above climatic conditions interfered with hunting during the second half of the year and although 30 elephants were shot during August and September the year closed with only 35 having been obtained towards the 1961-62 target of 135.

Difficulties in the disposal of products were more or less confined to the sale of meat. Ivory, to the value of which the annual Government grant is now correlated, was sold at the Government auctions at Mombasa. Feet and earskins were sold locally on the open market, though attempts were also made to find overseas buyers. The market for the former is somewhat erratic but there appears to be a growing demand for ear leather.

Meat was sold to various estates and other large employers of labour but though there is undoubtedly a demand for it in the Coast Province, bulk buyers are few and distribution to small retailers is beyond the capacity of the scheme.

During part of August hunting had to be suspended until stocks of meat on hand could be disposed of and though the end of the year saw famine relief organizations taking every pound that could be produced the problem will have to be faced again as soon as conditions return to normal.

A possible solution which is being explored is that of entering into a contract with a pet-food manufacturer to set up a canning plant on the spot where fresh meat could be tinned for export to European and American markets.

Experience during the year greatly increased the efficiency of preparing biltong and other products and the many miles of tracks which were cut reduced the time spent on hunting and bringing in the quartered carcasses.

Aerial surveys and counts of elephants in parts of the scheme area and neighbouring regions of the Tsavo Royal National Park were carried out in January, February, March, May, June and October and although herd movements are likely to have been atypical because of unusual climatic conditions, the results will, it is hoped, help towards a better understanding of seasonal distribution and densities.

Personnel of the scheme suffered considerably from the flood conditions which prevailed during the last three months of the year. The Galana River rose to an unprecedented level, inundating both Wardens' houses and some of the administrative buildings. Scheme headquarters near Lali Hill was cut off from all communication by road and on several occasions had to be maintained by air drops from army aircraft.

OTHER GAME CROPPING SCHEMES—GENERAL

As with the Galana River Scheme the problem of the profitable disposal of large quantities of dried meat from remote areas remains unsolved and though famine conditions produced a transitory but large demand from relief organizations it was not always possible to take advantage of it, since drought had either reduced game populations to dangerously low levels or the subsequent floods made cropping impracticable. In many cases local conditions were such that any meat that could be obtained had to be distributed free on the spot rather than sold to the common pool.

The assistance received from the Animal Industry Projects Section of the Kenya Veterinary Department in training staff in the preparation of meat and hides and in finding markets for these products must be gratefully acknowledged.

Narok District

In April an experiment was carried out by the Fauna Research Officer in conjunction with Dr. Lee Talbot and Dr. Mann of the Animal Industry Projects Section as to the practicability of cropping zebra and wildebeeste on the Loita Plain when they make their annual movement to that area from the Mara region.

Though this movement takes place during the wildebeeste calving season the results proved that it is practicable to shoot males without undue disturbance of the herds and consequent loss of youngsters.

All aspects of the work were carefully costed and resulting calculations showed that although zebra gave a fair return from hides alone, wildebeeste could only be profitably harvested if there was an assured market for the meat. Somewhat limited attempts to sell fresh meat in the neighbouring Kisii District proved unsuccessful, so all was turned into biltong. The failure to find markets for the fresh product must be regarded as the result of insufficient preliminary investigation rather than evidence that they do not exist.

Unfortunately the unexpectedly early departure of both wildebeeste and zebra from the Loita Plains, following the failure of the long rains, prevented further operations and the results therefore remain inconclusive.

Kajiado District

Heavy losses of animals in the proposed cropping areas during the drought precluded any large-scale harvesting.

In August however numbers of zebra invaded Bissell School farm and neighbouring Masai ranches and during attempts to drive them out many had to be shot. The skins of these were recovered and the meat used on famine relief.

Half the skins had been sold by the end of the year providing Sh. 3,825 for the African District Council. One parcel of first grade skins which were sent for auction in London yielded an average of £6 13s. profit after packing, freight charges and commission had been deducted.

Samburu District

Losses from drought were negligible but heavy rain during October, November and December curtailed cropping operations with the result that the agreed total was not removed from the Baragoi grazing schemes.

Five hundred and forty-three Burchell's zebra were however shot on the Leroghi Plateau and though many of the skins were spoilt by damp, meat and hides of these, together with those of the ten Grevy's zebra and 33 oryx shot elsewhere, produced Sh. 27,746 for the African District Council.

E—Exploitation by Capture and Export of Live Animals

Although the capture of wild birds and animals for the pet trade is generally not sanctioned the demand for animals for zoos of established standing showed no sign of slackening and 19 permits to deal in live animals were issued during the year.

Apart from monkeys and baboons for scientific institutions a total of 542 wild animals and 383 birds were exported or re-exported during the year, on which the exporters put a value of £47,326.

Of these only 50 animals and 21 birds came originally from countries other than Kenya and the figures take no account of the large numbers of both animals and birds which were exported from Tanganyika and Uganda but despatched from embarkation points in Kenya.

The animals ranged from elephants, rhinoceros and giraffe to bush babies, rats and tortoises. The birds were principally flamingos, various species of cranes, touracos and birds of prey.

Capture permits for 257 animals were issued during the year.

The demand for monkeys and baboons for the production and testing of vaccines increased enormously and altogether 17,544 grey vervets and 1,441 baboons were despatched by air. Of these 6,605 monkeys and 337 baboons originated in Tanganyika and 2,178 monkeys in Uganda. Gauged by the numbers supplied the demand comes from the United States of America, the United Kingdom, Italy, Holland, Canada, Germany and Austria in that order.

Investigations were carried out in co-operation with the airlines, the R.S.P.C.A., the E.A.S.P.C.A., the Ministry of Health, and trappers and dealers in an endeavour to improve the conditions in which these animals are trapped and transported. The Department is grateful for all the co-operation received.

PART III—CONTROL

A—Control by Shooting

GAME CONTROL

As usual it is extraordinarily difficult to arrive at an estimate of the depletion of stocks due to the necessary killing of wild animals in defence of life or property. Columns 1 and 2 of Table 4 below show the number of animals of eight major species shot on control by members of the Game Department during 1960 and 1961; control in this sense meaning the elimination of animals guilty of having killed a human being or livestock or caught raiding crops or plantations. It also includes the putting out of their misery of certain animals, including in 1961 six rhinoceros, which had previously been wounded by poachers or damaged by snares.

Column 3 shows the numbers of the same animals known to have been killed by Honorary Game Wardens Working for the department and by landowners and others acting within their right to defend themselves or their property.

Columns 1 and 2 show complete figures. Column 3 does not. The reason for this is that full returns are not received from all Honorary Game Wardens and because, though the law requires any individual killing a Second or Fourth Schedule animal to report the occurrence to the Game Department, that is regrettably rarely done unless the person concerned wishes to make use of the skin or other trophies.

For an approximation of the true numbers it is thought that the figures in column 3 should be multiplied by three, or four in the case of buffalo, giraffe and leopard.

TABLE 4—ANIMALS KILLED IN DEFENCE OF LIFE AND PROPERTY

Species	By Game Dept. 1960	By Game Dept. 1961	By Others 1961
Elephant	329	339	67
Rhinoceros	32	40	3
Hippopotamus	65	32	—
Buffalo	399	373	198
Giraffe	11	3	34
Lion	27	66	43
Leopard	14	22	19
Cheetah	1	—	15

In addition to the above 760 game animals of other species were destroyed by members of the department in the course of control duties.

No idea can be given of the numbers shot by private landowners, but because of the unusual drought conditions which caused animals to concentrate wherever grazing was available, they are thought to have been unusually high. For instance the Game Warden, Kajiado, estimates that some 1,500 zebra and nearly 1,000 wildebeeste were shot by Machakos District farmers when their land was invaded by hordes of those animals coming from the Athi-Kapiti Plains in search of water and grazing.

Apart from control in the sense of dealing with an individual animal which has been making a nuisance of itself steps have sometimes to be taken to reduce a population which has become too numerous for its habitat to maintain. Examples of this which occurred in the course of the year were the elephant herds of the Mara region, the coastal forests near Lunga Lunga and parts of the Tsavo (East) Royal National Park. In the first instance elephants have begun to destroy the riverine forests and hillside thickets which add so much to the beauty of the region and on which so many of its wild animals depend. On the coast they have for some years tended to spread out from the forest and have been doing increasing damage to coconut plantations and other forms of agriculture and in the Tsavo Royal National Park large areas of Commiphora woodland have now been completely destroyed.

The Department was lucky enough to obtain the services of Mr. Eric Rundgren, a professional hunter and ex-member of the Department, to deal with the first two cases. In May he shot 49 of the Mara elephant during the period when they leave that area and move to the Chepalungu Forest on top of the escarpment. In September he moved to the coast and shot 107 elephants in the Lunga Lunga neighbourhood and a further nine in the Arabuka Forest.

With regard to the Tsavo problem the Department has undertaken to shoot an additional 100 elephants in the Galana River Game Management Scheme area, irrespective of whether the meat can be fully utilized, whenever a movement from the Park affords an opportunity.

VERMIN CONTROL

In the Garissa and Lamu Districts the African District Councils continued to maintain teams of vermin control scouts working under the direction of the Game Department and Isiolo formed a similar team in October, also to be paid for from Controlled Area receipts. Results of operations in the Lamu area are unknown but 207 hyaenas and 558 baboons were killed by the Garissa team and 260 hyaenas and 22 jackals at Isiolo.

Game Department staff continued to give direct assistance whenever possible and destroyed a total of 544 hyaenas amongst other vermin, chiefly in the Kajiado, Narok and Nanyuki Districts.

B—Control by Capture

RHINOCEROS—GAME DEPARTMENT CAPTURE UNIT

This small team, consisting of one Warden and seven Scouts, with an additional assistant for part of the year, provided with the co-operation of the East African Wild Life Society, succeeding in "darting" and capturing a total of 13 rhinoceros in the Simba area. This is a very satisfactory total when it is remembered that the object is not to catch just any rhinoceros but those particular animals which are being harried by poachers and which are in consequence extremely wary and rarely move far from the shelter of the adjacent lava flows and thickets.

The year started badly with two animals dying from respiratory failure caused by acidosis; apparently a known side effect of the drug used. Medical advice was the administration of oxygen immediately after capture and since that practice has been adopted there has been only one other casualty; that of a very old and senile bull, blind in one eye, for whose system the whole procedure was probably too much of a shock. One other animal died after it had been in captivity for some time, the cause of death being a cut on the foot which rapidly went gangrenous despite all attempts at treatment.

Of those captured, one pair was taken to the Addo National Park, Cape Province, South Africa, in March, where attempts are being made to reintroduce this species, and a further six were promised for later in the year. While these were still in the pens awaiting shipment the Kiboko River burst its banks and inundated the camp, flooding the pens and softening the ground in which the logs from which they are made were planted.

The succeeding days and nights with walls collapsing and rhinoceros escaping and moving in and out of one another's pens in the manner of a French farce were chaotic, and great credit is due to the Warden for succeeding in crating five of them and moving them to Mombasa as soon as the road and railway, both of which had been breached by the flood, were in service again. Two others escaped during the process.

The five were duly shipped to Durban where they joined the pair despatched in March and latest reports state that all seven are doing well.

One other rhinoceros was released in the Tsavo (East) Royal National Park and another handed over to the Warden of the Nairobi Park.

RHINOCEROS—OTHER METHODS

One rhinoceros of four captured by Mr. Carr Hartley on private land, where they had been causing damage, was released at the Mount Kenya Game Lodge on the occasion of its opening by H.E. the Governor. Unfortunately it has not been seen since and its disappearance leads to speculation as to whether rhinoceros from the low country will remain at high altitudes if released there and vice versa.

THOMAS' KOB

During August another attempt was made to move breeding nuclei of Thomas' Kob from Lugari to other selected places; the operation being performed by Messrs. G. A. G. Adamson (then on leave pending retirement), Mr. J. McKeand (a former member of the Game Department who took part in the original attempt) and the Game Warden, Kapenguria. The method used was the same as before, i.e. "darting" the animals with a Cap-Chur gun using succinyl-choline-chloride as the immobilizing agent.

On this occasion captured animals were not held at Lugari but were despatched to the release point in a darkened lorry each night under the influence of largactol. This method proved completely satisfactory, no casualties occurring on the way. Of the 44 captured, 34 were taken to near the junction of the Sand and Mara Rivers (a journey of 15 hours) where a large *boma* had been prepared for their reception.

The intention was to hold the kob there for up to three weeks before release, to allow time for them to develop a herd sense and a sense of territory. Unfortunately after only 16 had arrived they found a way through the *boma* and escaped in the night. The succeeding 19 had been held for only a few days when a leopard broke in twice and killed four, necessitating the premature release of the others.

Those which escaped or were released apparently scattered as no more than single animals or pairs were seen subsequently, making it very difficult to follow their fate. Odd individuals were seen in the area until late October when floods made the area impossible of access.

Eight other kob which were released simultaneously on Ziwa estate at Hoey's Bridge behaved similarly, refusing to remain together even when rounded up, and it seems possible that the drugs used may be partly responsible for this peculiar behaviour in a normally gregarious animal.

CARNIVORES

In all 10 stock-killing lions and 19 leopards which would otherwise have had to be shot were trapped and released in National Parks and other places of safety. All but one of these were caught by the Game Wardens stationed at Nanyuki, Maralal and Ngong.

EAST AFRICAN WILD LIFE SOCIETY CAPTURE TEAM

Largely owing to the generosity of Mrs. Adamson, the authoress and former owner of the lioness Elsa, the Wild Life Society was able towards the end of the year to equip and finance the maintenance of a capture team of its own to work under the direction of the Game Department.

This team has not yet taken the field, but it is intended that its first task will be the removal of as many as possible of the Rothschild's giraffe from the Endebess area where their presence is a nuisance to farmers.

C—Disposal of Trophies

Only one auction of Government ivory and rhino horn was held at the Ivory Room, Mombasa (on 15th June), the usual November sale being postponed until early 1962.

The amounts sold and the prices realized are shown in the following Tables 5 and 6. The sale produced a total of £42,692, the Kenya Government's share of which amounted to £18,898.

TABLE 5—TROPHIES SOLD—ALL FIGURES IN LB.

Description of Trophies	Kenya Government	Royal National Parks of Kenya	Uganda Government	Uganda National Parks
Ivory	27,560	5,384	22,953	3,818
Rhino Horn ..	119	—	—	—
Hippo Teeth ..	261	—	177	502

TABLE 6—AVERAGE PRICES REALIZED—ALL FIGURES IN SH. PER LB.

Category	Prices Realized
Vilaiti Ivory	12/95 to 16/74
Cutchi Ivory	12/50 to 13/50
Calasia Ivory	14/10 to 15/50
Fankda Ivory	11/62 to 13/90
Mascub Ivory	13/55 to 16/00
Daudia Ivory	17/50 to 17/86
Chinai Ivory	11/78 to 13/02
Rhino Horn	40/00 to 61/00
Hippo Teeth	4/80 to 5/00

The fall in the average price of ivory from Sh. 16/50 at the November, 1960, sale to Sh. 14/28 in June, 1961, can largely be accounted for by the greatly increased quantities coming from the Congo; 220,000 lb. of Congo ivory passing through Mombasa in 1961, as compared to 150,761 lb. in 1960 and 95,527 lb. in 1959.

The import restrictions on ivory entering India and on carved ivory from Hong Kong entering the U.S.A. remained in force.

Over 1,400 lb. of rhino horn was withdrawn from the sale because of the low prices offered. It is feared that this drop in value may indicate that the market is being flooded with illegal horn, large quantities of which are known to have been smuggled out of East Africa.

Apart from the Ivory Room sale periodical sales of trophies were held at Game Department headquarters which realized a total of £4,021.

Trophies sold represented the outcome of both control operations and the prosecution of offenders under the Wild Animals Protection Ordinance and included 82 lion and 179 leopard skins.

D—Compensation for Losses

Several African District Councils are anxious to follow Kajiado's example and start local compensation schemes for losses sustained from wild animals.

In most cases the only funds available for that purpose are, appropriately enough, the receipts from Controlled Area fees and as can be seen from Table 3 they are in almost all cases hopelessly inadequate. Nevertheless such schemes were started by the African District Councils of Narok, Samburu, Kilifi and Isiolo with varying degrees of success.

The lack of compensation for the damage it does is the major cause of resentment and dislike of game in rural areas and until that difficulty can be overcome there is little hope of gaining support for conservation measures from the very people on whose co-operation they depend. The solution appears to lie in encouraging local authorities to start their own compensation schemes.

Claims submitted to the Game Department, which had to be rejected, ranged from the loss of a whole herd of sheep and goats totalling 47, which were killed by a single leopard in one night, to 1,924 coconut trees and 10,500 banana trees destroyed by elephants.

PART IV—LAW ENFORCEMENT

A—Illegal Hunting

Reports from all sources indicate that 1961 was one of the worst years on record for poaching. In some areas the increase in illegal hunting could be attributed to famine which succeeded the failure of crops and the loss of stock from drought, but unsettled political conditions led to a feeling of instability and lawlessness throughout the country and in many cases there was a genuine feeling that if *uhuru* meant, as it was said to do, that everything in Kenya was to be had for the taking, it would be as well to get in before the rush started.

As in the previous year, the Wakamba with their poisoned arrows and spears were by far the worst offenders and though the crop failure from which they suffered might have excused a lot of the hunting for meat, poaching for rhino horn and ivory, when the carcasses were often left quite untouched, reached unprecedented proportions.

The Waboni and Wasenyi also indulged in commercial poaching of an increased intensity, hunting mainly with their heavy bows and poisoned arrows, and the Taita and Giriama added to the slaughter in the Coast Province, many beasts falling victim to their snares.

The Masai were in the main law abiding except for the serious prevalence of rhino spearing in Kajiado District where, as already mentioned, 40 of these animals are known to have been killed. Though some of the killings were undoubtedly done, or instigated, by Wakamba or Chagga poachers from outside the district the names of those convicted indicate that the greatest offenders were the Masai themselves.

The closing down of the Game Department station at Embu means that less is known of what went on in that district during the year, but such reports as were received indicate that poaching was worse than ever before, the poachers' task being made simpler by the concentration of animals on any available water. The Tharaka also hunted in large bands killing anything possible, but concentrating on rhinoceros. One pair of horns recovered from a party of Tharaka poachers were identified as those of a rhinoceros which had been captured and released in the Meru African District Council Game Reserve two years before.

The Meru using traps, snares and occasionally dogs, hunted more as individuals.

Lower down the Tana the Riverine tribes took a heavier than usual toll with traps and snares and also with the bows and arrows with which they and the Orma armed themselves during the course of the year from political fears.

In the Northern Province the Boran were again the worst offenders, hunting with dogs and spears. The object of their poaching is mainly, as the Game Warden, Marsabit, puts it, for no other purpose than prestige. The ivory of the elephants they kill is rarely taken but an ear it cut off and taken back to show to the young women. The number of elephants killed in the Isiolo District and on the borders of Samburu District in these affrays reached serious proportions and buffalo and other game suffered as well.

Similar practices may have accounted for as many as 20 lions in the Moyale area.

Giraffe as well as rhinoceros are heavily poached in the Northern Province, the former because of the value of their hides, from which well-buckets are almost exclusively made, and the Game Warden, Marsabit, thinks that more than 100 may have been killed in the Marsabit and Moyale Districts alone.

The Samburu, like the Masai, have not taken to illegal hunting on a large scale but, as the Game Warden, Maralal, puts it, "they continue to throw their spears at passing rhinoceros and elephants for the pure hell of it" and the large number of animals wounded in this way results in many having to be destroyed after they have attacked innocent passers-by.

The Turkana in the western part of Samburu and Marsabit Districts and where they have been employed in the Isiolo District, or absorbed into the Samburu tribe (mainly to the east of the Mathews Mountains) are perhaps the worst offenders of all, since they continue the practices which have made their own principal area to the west of Lake Rudolf almost game-less. They will hunt anything that moves by any means, either for food or for sale.

The Wanderobo take a steady toll of game, though it is not thought that their efforts seriously threaten stocks except in the escarpment country on the Isiolo-Nanyuki boundary and in parts of the Mau.

The perimeters of all forests are fairly heavily poached by surrounding agricultural tribes, chiefly by means of snares, but sometimes using dogs and, where labour is not kept under proper control, many European farming areas are subjected to the same treatment.

Though Nyanza Province now contains little game, poaching there during the year provided the worst examples of blatant defiance of the law. In the Lambwe Valley, which contains the last sizeable herds of roan antelope and Jackson's hartebeeste in Kenya, gangs of up to 200 frequently defied and threatened Game Scout and Tribal Police patrols and on one occasion 109 rounds of ammunition had to be fired before one such party could be dispersed. Several arrests were made.

B—Illegal Trade in Trophies and Other Products

Though several of the smaller buyers were apprehended during the year no real progress was made in suppressing the illegal trade in rhino horn, and no success is to be expected until the matter can be taken up on an inter-territorial basis by the Criminal Investigation Department. Police and Game Department officials intercepted several consignments of up to 20 horns each on their way to the coast, but information continued to be received of far larger amounts reaching their destination, such as the 1,400 lb. (the equivalent of 100 average rhinoceros) believed to have been delivered at one far eastern port and the 113 horns seized in Aden.

The drop in the open market price of this commodity could be taken to indicate a reduction in demand, but unfortunately it is far more likely that the demand is now being satisfied by cheaper illegal horn, the price of which is still high enough to encourage poaching. This is almost certainly the case with Arabia, to which country legal exports have dropped to almost nothing.

The illegal trade in and export of ivory and leopard skins also continued unabated.

The drive against the use of poisoned arrows, resulting in more prosecutions being brought under the Pharmacy and Poisons Ordinance for the possession of arrow poison, may have done some good, but large quantities are still being manufactured on the coast and peddled to the Wakamba, with whom it is often exchanged for cattle. One such party arrested by an Honorary Game Warden had no less than 2,145 packages of poison for disposal.

C—Prosecutions

Prosecutions resulting in the conviction of 552 individuals for offences against the Wild Animals Protection Ordinance were brought by officers of the Game Department.

PART V—RESEARCH

A—Departmental Research

The work of the Fauna Research Officer on determining the food preferences of herbivorous animals by identifying fragments of plant cuticle in their faeces and stomach contents has made satisfactory progress. The preliminary task of preparing a reference collection of slides of the cuticle of known species is now

almost complete in respect of the common grasses and slides have been photographed and the peculiarities of each species have been described. The work of application has begun and the identification of fragments from the faeces of various animals feeding on pastures of known composition is showing interesting results.

The next stage in the programme, that of feeding captive animals with known plants in definite proportions, to determine whether quantitative as well as qualitative results can be obtained by this technique, is about to begin.

The recording system for biological data on Kenya's wild animals introduced by the Fauna Research Officer is now up to date in regard to old records and is being added to as further information comes to light.

As one facet of this work distribution maps of 60 of the more important animals will be published shortly.

In addition to the foregoing the Fauna Research Officer has continued and enlarged the programme of aerial surveys of important faunal areas begun several years ago. The results of one such survey, the first to cover the whole of the Serengeti-Mara region, which was carried out in conjunction with Dr. Lee Talbot of the Wildlife Research Project, has been submitted for publication in the Journal of Wildlife Management.

B—Other Research

The Wildlife Research Project sponsored by the National Academy of Sciences—National Research Council of the United States of America completed its rather more than two years' work in the field in October and Dr. and Mrs. Lee M. Talbot returned to the States. The publication of their full results is eagerly awaited.

Dr. A. M. Harthorn of Makerere College continued his experiments on the immobilization of wild animals by the administration of drugs by hypodermic darts. Though most of these were carried out outside Kenya the Department continued to benefit from his results and his advice.

The work of Dr. W. J. A. Payne and Mr. M. P. Ledger of the East African Agriculture and Forestry Research Organization on carcass analysis of wild herbivores continued with oryx beisa and Grevy's zebra and it is hoped they will extend their research to cover all major species.

Dr. G. S. Nelson of the Medical Research Laboratory carried out further research on the incidence of trichinosis and extended the list of naturally infected wild animals in which he has found the disease to include lion, leopard, cheetah, spotted hyaenas, side-striped jackal and bush pig. The one lion concerned was an old and apparently sick animal and its infection, Dr. Nelson believes, confirms the suspicions of the Warden who shot it that it had been feeding on hyaenas.

Dr. Nelson also carried out investigations on the role of wild animals as reservoirs of hydatid disease and bilharzia.

As in previous years officers of the Department assisted in various research projects by collecting parasites and by supplying whole carcasses and tissue samples of various species of dead animals. One of the most interesting investigations was that of Dr. Foy of the Wellcome Research Laboratories into the degree of radioactivity shown by palearctic migrant ducks, which it was thought might have been affected by atom bomb explosions in Siberia. The number of carcasses tested was too small for any definite conclusions to be drawn, but no examples of high activity were discovered.

PART VI—BIOLOGICAL MATTERS AND NOTES ON INDIVIDUAL SPECIES

A—Disease

The rinderpest epidemic which swept the Marsabit, Samburu and Isiolo Districts during the previous year and was reported in the 1960 Annual Report to have reached the Mount Kenya forest above Timau during December, caused heavy losses amongst buffalo, eland, bushbuck and pig in the last-named region during January and February. The disease then moved slowly round the mountain in a clockwise direction, affecting game in the Meru and Embu forests, where it appeared finally to die out in September. As had been feared bongo in the Embu forests became affected, though the percentage of casualties is not known. The horns of one bull which was found dead of the disease were almost in world trophy class.

Another arm of the epidemic advanced from Meru slowly down the Tana River reaching Balamballa in June. By August it was on the wane but later flared up again at Saka further down the river. Though the disease was not as virulent as it had been in the Samburu and Isiolo Districts the toll of buffalo and giraffe was heavy, at least 40 of the latter animals being known to have died.

In no other area is rinderpest known to have occurred in epidemic form, but the disease was responsible for the usual number of deaths of yearling wildebeeste and buffalo in the Narok District, though, as far as is known, no other species was affected.

A disease having all the appearance of anthrax (though no clinical diagnosis was obtained) broke out in elephants and rhinoceroses in the southern part of Samburu and the Isiolo Districts early in the year and deaths continued up to the onset of the rains. Twenty-three elephants and two rhinoceroses are known to have died.

A crocodile which had been feeding on one of these elephants which died in the Uaso Nyiro River was seen to be in distress and to have large sores on its sides. Later it was found dead.

Five elephants were also found dead near Kilgoris which may have died of the same disease.

Other unknown diseases caused relatively high casualties amongst wild animals in certain restricted areas. Amongst these was one which caused 80 known deaths of Kenya hartebeeste on the Leroghi plateau and in the neighbouring settled area and another which apparently affected all animals in a part of the Tinderet Forest during January to April, carcasses of bush pig, giant forest hog, duiker, bushbuck, buffalo and monkeys being found.

All but three of the isolated herd of 23 roan antelope on Mr. Forrester's farm at Endebess died during the first few months of the year.

Very large numbers of lesser flamingos were found dead or in a dying condition on most of the lakes inhabited by the species in late August and September. Though in some cases this might have been attributable to drought affecting food supplies that explanation does not seem applicable in the case of Lake Rudolf.

B—Drought

The reiteration of the word drought in each section of this report shows how this phenomenon affected every facet of the Department's work.

Opinions differ as to when, if ever, similar conditions were last experienced, but there is no doubt that the virtual failure of three successive rains made the position in the first nine months of the year exceptional, and to that was added a country-wide plague of "army worm" which destroyed every vestige of grass over wide regions.

The direct effect of shortage of forage and water was apparent in game almost everywhere, but though there was loss of condition and an unusually high mortality rate, particularly amongst the young, in most cases the indirect results were more serious. Large numbers of animals such as elephants and rhinoceros had to be killed when they came into conflict with man and his domestic stock over water and thousands of zebra and other grazing animals were destroyed when they invaded settled areas in search of grazing on which farmers were hard put to maintain their own stock. This latter position was particularly bad in the Laikipia and Nanyuki Districts where game moved up from the more arid parts of the Northern Frontier District and in the Machakos District. The increase in poaching, too, could often be attributed directly to hunger arising from the loss of crops or stock.

In areas where the land had been badly abused and where its carrying capacity had been greatly decreased by the overgrazing of domestic stock the results of the drought were however both direct and dramatic, animals of all sorts dying by the thousand from sheer starvation.

The worst example of this sort was Kajiado District in which the numbers of Masai cattle are reported to have been reduced from 500,000 to 200,000 and where losses in wild animals were very heavy.

In parts such as the Athi-Kapiti Plains to the south of Nairobi Royal National Park, where all remaining grass had been destroyed by army worm, the carcasses of wildebeeste, kongoni and zebra could be counted at the rate of two or three to the acre and similar conditions prevailed in the Park itself despite the availability of water, maintained in many cases by artificial means. When rain did at last come it fell first on the farming land to the east, initially in the Konza area and later further north. Surviving game from the whole region concentrated in these two small areas, threatening the very existence of the farmers concerned, and in various fruitless attempts to drive them away many hundreds of animals were killed.

The total casualties amongst game in this area cannot be accurately determined and it is most unfortunate that the Game Warden, Kajiado, who for the previous three years had carried out monthly counts from the air (*see* 1960 Annual Report for results) suffered an accident in March which put both him and his aeroplane out of commission. He did however manage to make one survey at the beginning of August, using another aeroplane, the results of which showed a total of only 5,801 wildebeeste, 1,955 zebra and 894 Coke's hartebeeste to be present.

Although this area, which includes the Nairobi Royal National Park, is thought to be an almost closed ecological unit, bounded as it is by Nairobi to the north, the rift wall to the west, the broken bush country on the line of Kajiado to the south and the Machakos hills to the east, it would be dangerous to compare these figures to the average counts of 1960 and say that 3,100 (35 per cent) of the wildebeeste, 3,200 (62 per cent) of the zebra and 4,300 (83 per cent) of the hartebeeste, had died or been killed.

As the Warden points out some zebra did move down into the Rift Valley and southwards towards the Tanganyika border and it is not impossible that some wildebeeste and hartebeeste also went elsewhere, though that is most unlikely in the case of the former species. The figures do however give an idea of the magnitude of what may have happened and it seems safe to say that losses in these three species totalled well over 5,000.

It is significant that during the count only one young wildebeeste was seen, which confirms the impression gained from the ground that the whole of the year's crop of calves was lost.

Thomson's gazelle also appear to have suffered badly, many carcasses being seen and less than 400 being counted from the air, and it appears that the drought may have seriously reduced the numbers of this species, already on the decline from the deterioration of pasture due to overgrazing.

Grant's gazelle and eland suffered less since, being less dependent on grass, both were able to move out of the region.

The sudden appearance of thousands of animals on their farms led several Machakos farmers to state that the neighbouring plains were vastly overstocked with game, but it must be remembered that rain fell in such restricted localities that the animals of 1,500 square miles were concentrated into tens of square miles and that the average of aerial counts show a stocking rate of one 500-lb. game unit to each 32 acres, though admittedly they are superimposed on vast numbers of Masai stock.

The conditions prevailing on the Athi-Kapiti Plains were reproduced with varying degrees of intensity throughout the Kajiado District of Masailand and in parts of the neighbouring Kamba country and large numbers of plains game died in the Amboseli region.

Adequate breeding stocks of all species have however survived which, given a fair chance, will repopulate the devastated areas.

In some areas of the Tsavo Royal National Park drought so accentuated the damage done to vegetation by an apparent local overpopulation of elephants that over two hundred rhinoceroses died of starvation, a cause which was confirmed by several autopsies carried out by veterinary officers. Similar conditions were however not reported from elsewhere, presumably because of lower concentration of both species of animals.

C—Floods

The drought was succeeded in September by almost countrywide rains of unusual intensity, which, owing to the rapid run-off from bare soil, often caused widespread flooding. Lakes formed where lakes had never been before and rivers such as the Athi and Tana flowed at many times their normal width, the latter being reported to be over 100 miles across near Garsen.

The Northern Frontier District received its fair share of the rain and most of the luggas became raging torrents, the Milgis lugga which drains much of the eastern side of the Ndoto mountains being flooded to a width of 20 miles in parts. Road and rail communications were cut isolating many areas, and at one time only one Game Department station was accessible by road from Nairobi.

The effect on the vegetation was almost miraculous, and in a short time the plains were once more covered with grass wherever roots had managed to survive, and elsewhere vast areas of weeds appeared to hold the soil together.

Riverine areas suffered seriously however and long stretches of forest were torn away from the banks of the Galana and other rivers, leaving nothing but sand.

The effect on wild life was twofold; to provide fresh grazing for the plains animals, which did not appear to suffer casualties from bloat in the same way that cattle did, and to threaten others with drowning.

Owing to the difficulties of getting about very few observations were made of casualties amongst the smaller antelopes and since their carcasses quickly disappear no accurate estimate can ever be made by direct observation.

Losses amongst such species as bushbuck, red forest duiker and waterbuck which are largely confined to riverine vegetation must however have been very high along the Tana and Galana Rivers and the Game Warden, Garissa, in fact reports several deaths amongst these animals in Garissa township itself. Similar toll must have been taken along the banks of the Uaso Nyiro and many of the Northern Frontier District luggas.

In other regions which disappeared under standing floods such as many of the haunts of topi and Hunter's antelope near the coast, the normally resident population of animals must have been drowned or driven out.

In the Samburu and Isiolo Districts losses amongst sheep and goats were heavy from foot infections resulting from waterlogged conditions and the Game Warden reports that some antelopes appeared to be suffering in the same way.

Casualties amongst larger species such as elephants, rhinoceroses and giraffe are more easily noted and it may also be that such animals are less adroit in avoiding danger. Deaths by drowning appear to have been heaviest in the Northern Frontier District where flash spates in normally dry stream beds were presumably most frequent, and despite the Wardens' inability to get around their ranges properly incidents of 13 elephants, 12 rhinoceroses and 6 giraffe meeting their death in this way have been recorded. Another dozen elephants and many buffalo, zebra and wildebeeste are also reported to have been drowned in the Mara region, and though records from the Tana River amount only to sightings of carcasses or live animals being swept down in mid-stream, there have been four of these, one of them involving three elephants and two taxis in company!

Both elephants and rhinoceroses were reported as being carried out to sea by the flooded Sabaki River and two of the former are alleged to have swum back and landed on the beach near Malindi.

It therefore appears that the number of deaths from drowning must have been significant in large as well as small animals.

In passing it is worthy of note that two hippopotamus have turned up in Zanzibar, presumably having been swept out to sea from some East African river.

Apart from actual drownings many animals have died after having become stuck in mud, giraffe in particular being reported to have suffered this fate in the Kitui, Isiolo, Samburu, Marsabit and Wajir Districts, as many as 20 carcasses being seen by one Game Scout in a single week in the last-named area.

D—Animal Numbers and Game Counts

RHINOCEROS POPULATION

Before wildlife management plans can be considered, let alone put into operation, it is necessary to have some idea of the existing population of the species under consideration, its reproductive rate and the rate of depletion from various causes.

Such data unfortunately is usually beyond the means of African Game Departments to obtain under present day conditions, except in rare incidences of small and isolated populations of easily observable animals, but the following figures in respect of rhinoceros in Kenya are produced in order to give some idea of the magnitude of losses from various causes of one of our most threatened species.

The estimate of the total population of black rhinoceros in Kenya submitted to the I.U.C.N. Survival Commission in 1959 in response to their questionnaire was 2,560. (That number is now thought by the writer to have been an underestimate.)

The gestation period given in the International Zoo Yearbook is 540 days. Assuming that the sexes are equal in numbers, that the population shows an even progression of age groups and that females go on bearing at the rate of one calf every two years from the age of five until death at the age of 25 years (for which assumptions there is no conclusive evidence) the maximum increment from such a population could be 512 a year.

Known deaths from other than natural causes in 1961 were as follows:—

(a) Shot by hunters on licence	86
(b) Known to have been killed in defence of life or property (Game Department and others)	43
(c) Known to have died as result of drought in Tsavo Royal National Park (actual period August, 1960, to September, 1961)	282
(d) Known to have been drowned	14
(e) Known deaths from accident (trains, fighting, elephants, etc.)	5
(f) Found dead, cause of death unknown	24
(g) Known to have been killed by poachers	139
Total ..	593

If, as is thought possible, the figures given under (d) to (g) are no more than 30 per cent of the true totals, due to inadequate cover by the Game Department, unnatural deaths may have been as high as 984. To this must be added deaths from old age which, keeping to an estimated life span of 25 years, would be 102.

Despite this heavy toll rhinoceros cannot be said to be in immediate danger of extinction. In fact, thanks to their extreme adaptability, which enables them to live in habitats varying from the forests of Mount Kenya to the lava country of Lake Rudolf, they are still quite plentiful in a number of areas where they are not subjected to poaching. They are, however, extremely susceptible to that practice and can be rapidly wiped out once it starts.

The great danger is therefore of the habit of killing rhinoceros for their horns spreading to tribes and areas as yet unaffected.

MOUNT KENYA FOREST CENSUS

During the year the Forest Department attempted a simultaneous count of big game in the various forest sections encircling Mount Kenya. The difficulties of such a task in country of that nature are enormous but principally by the method of counting fresh tracks in support of local knowledge a total of 115 rhinoceros, 1,415 elephants and approximately 5,000 buffalo was arrived at.

AERIAL COUNTS

(a) Aerial counts of game in the Samburu grazing schemes were again made in May and August and also in the Meru Northern Grazing Scheme and the Somali Concession and Leasehold areas. Since there is no ecological distinction between these latter areas and the subdivisions of the Meru Scheme, results are shown for a single unit in Table 8. The Samburu figures are given in Table 7.

Comparing these results with those of the 1960 counts (*see* 1960 Annual Report) the Fauna Research Officer suggests that there are indications of a possible seasonal long distance migration amongst certain of the species. It would however be dangerous to embark on deductions on the result of only two years' observations and little can be proved until a technique of large-scale marking has been evolved.

(b) Game in the Loita Plains and the whole of the Mara area was counted in May by Dr. Lee Talbot of the Wildlife Research Project, and the Fauna Research Officer as part of a larger survey covering the Serengeti National Park as well. A second count was made in October by the Game Warden, Kajiado, and the Fauna Research Officer.

Analysing these figures and the results of previous counts, the Fauna Research Officer makes the following comments:—

Wildebeeste.—Numbers in the Loita-Mara area fluctuate between 5,000 and 25,000 according to influxes from the Serengeti, depending principally, no doubt, on climatic conditions. It is noteworthy that no seasonal change has been observed, e.g. from November, 1959, to November, 1960, the Game Warden, Kajiado, and Dr. Lee Talbot, with ground and aerial counts, record a maximum of 8,000 only.

Zebra.—Numbers between 7,000 to 21,000 have been recorded; the same remarks apply as for wildebeeste.

Topi.—These occur mainly towards the south-west of the area and the cause of low counts may be local movements over the Tanganyika border. It seems probable that the maximum Mara population is in the region of 4,500.

Coke's Hartebeeste.—These occur mainly towards the north-east of the area and the population probably does not exceed 1,000.

Eland.—Further evidence is required for an accurate assessment of the population, but there appears to be movement into and out of the area.

Buffalo.—All counts are probably substantially low as these shy animals move into bush on the approach of an aircraft. The population may approach 8,000.

Elephant.—Another species difficult to count because of its shy habits. Substantially fewer at the time of the October count than in May. The maximum population observed to date seems to be about 500.

Rhinoceros.—An animal unsuited to being counted in this manner over ground of that nature. Therefore a minimal figure.

TABLE 7—COUNTS OF SOME GAME ANIMALS AND LIVESTOCK IN SAMBURU GRAZING SCHEMES—1961

Area	Date	Elephant	Rhino	Grey's Zebra	Common Zebra	Oryx Beisa	Kenya Hartbeeste	Impala	Genenk	Thomson's Gazelle	Grant's Gazelle	Giraffe	Buffalo	Eland	Ostrich	Cattle	Sheep and Goats
WAMBA (Wamba, Ngarone and Seya Schemes)	May	123	7	1,266	318	534	—	61	14	—	796	422	68	203	46	not counted	not counted
	August	134	34	1,871	97	880	—	4	45	—	1,797	378	—	215	52	18,500	6,040
LEROGHI (Plains, forest and escarpment)	May	84	3	3,624 (combined)	—	428	348	238	—	3,825 (combined)	—	70	25	170	134	not counted	not counted
	August	89	2	280 5,542 (combined)	—	343	346	425	—	6,307 (combined)	346	6	4	493	209	not counted	not counted
BARAGOI (El Barta, Merti and Kowop Schemes)	May	32	—	1,022	241	935	—	40	11	—	1,413	15	—	—	245	not counted	not counted
	August	55	—	682	88	918	—	—	—	—	988	62	—	107	151	19,194	4,265

Note.—The purpose of this survey was to record the numbers of zebra, oryx, hartebeeste and gazelles present. No particular effort was made to census other species but the numbers noted above are given for their interest as records of occurrences or minimal figures.

TABLE 8—COUNT OF SOME GAME ANIMALS IN PARTS OF ISIOLO AND MERU DISTRICTS—1961

Area	Date	Elephant	Rhino	Grey's Zebra	Common Zebra	Oryx Beisa	Kenya Hartbeeste	Impala	Gerenuk	Grant's Gazelle	Giraffe	Buffalo	Eland	Ostrich
Meru Northern Grazing Scheme areas A, B, C, and D; Somali Concession and Somali Leasehold areas.	May	295	6	1,573	3,217	1,376	—	281	136	2,205	1,207	—	522	159
	August	90	6	770	1,293	274	9	88	80	792	757	40	35	55

Note.—The same remarks concerning the recording of animals other than zebra, oryx and Grant's gazelle apply as to Table 7.

TABLE 9—COUNT OF SOME GAME ANIMALS ON LOITA PLAIN AND IN MARA AREA, NAROK DISTRICT—1961

Area	Date	Wildebeeste	Common Zebra	Topi	Coke's Hartbeeste	Eland	Buffalo	Elephant	Rhinoceros
Northern edge of Loita Plain in north to Tanganyika border in south. From Isuria escarpment in west to Siana and Kuka hills in east.	May	17,817	20,867	(a) 4,111	721	(b) 751	5,934	455	54
	October	22,916	13,595	2,680	821	173	4,163	143	20

Notes.—(a) Believed to be up to 10 per cent low.

(b) Partial count only (estimated total 1,500 to 2,250).

PART VII—LEGISLATION

The following legal notices affecting wild life conservation were published during 1961:—

Legal Notice No. 3 of 1961.—Amending Controlled Area fees to be paid in respect of elephants and introducing higher fees for those with tusks aggregating more than 139 lbs. and more than 199 lbs.

Legal Notice No. 4 of 1961.—Setting aside an area of approximately 165 square miles of the South-west Mau Forest as a Nature Reserve under the Forest Ordinance, principally to create a sanctuary for bongo.

Legal Notice No. 16 of 1961.—In which the Trustees of the Royal National Parks of Kenya surrendered their control of, and rights in, the Marsabit National Reserve, with the exception of two areas in which National Parks are to be created.

Legal Notice No. 370 of 1961.—Declaring all animals to be game animals within the areas set aside as Game Reserves or Game Conservation areas by the African District Councils of Meru, Narok and Kajiado.

Legal Notice No. 374 of 1961.—In which the Trustees of the Royal National Parks of Kenya surrendered their control of, and rights in, the Mara, West Chyulu, Amboseli and Ngong National Reserves.

DISPOSITION OF SENIOR WARDEN, GAME WARDEN AND SCIENTIFIC STAFF—31ST DECEMBER, 1961

Establishment	Headquarters Nairobi	Northern Province	Southern Province	Central Province	Coast Province	Rift Valley Province
Chief Game Warden (1)	Maj. I. R. Grimwood.					
Senior Game Wardens (2)		<i>Isiolo:</i> G. A. G. Adamson, M.B.E. (on leave pending retirement). K. A. Smith.	<i>Narok:</i> Maj. E. W. Temple- Boreham, M.B.E., M.C. <i>Simba:</i> Lt.-Col. R. A. F. Hurt, D.S.O. (on vacation leave).	<i>Nanyuki:</i> J. Barrah.	<i>Kaloleni:</i> W. L. Coles. <i>Mombasa:</i> S. Morris-Smith (i/c Ivory Room).	<i>Maralal:</i> R. T. Elliott (on vacation leave). <i>Wamba:</i> P. C. Saw. <i>Kapenguria:</i> A. D. Forbes- Watson.
Game Wardens (18)	Lt.-Col. N. S. Sandeman (Game Warden H.Q.).	<i>Garissa:</i> D. W. J. Brown. <i>Marsabit:</i> S. R. Bleazard.	<i>Kajiado:</i> D. R. P. Zaphiro. <i>Ngong:</i> D. H. McCabe, G.M. <i>Capture Team:</i> B. H. Carter, M.C.		<i>Hindi:</i> A. J. Carn (on vacation leave). <i>Galana River Game Manage- ment Scheme:</i> I. S. C. Parker.	
<i>Scientific Staff— Game Officer (1) . . .</i>	G. R. Davies (Temporary leave relief).					
Fauna Research Officer (1)	D. R. M. Stewart.		<i>Kilgoris:</i> A. D. Graham.			



