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ABSTRACT

WILDLIFE, MAN AND COMPETITION FOR LAND IN KENYA: A GEOGRAPHICAL ANALYSIS

By

Donald L. Capone

In this study the complex question of competition for land occupance in Kenya is approached in three ways: temporally, functionally, and in a case study. In Chapter I the physical, biotic, and human background to the problem of competition for land in Kenya is presented. The uniqueness of Kenya's wildlife resources is pointed out and habitat requirements are discussed. The potential threat to wildlife from human population growth is introduced and competition for land between men and animals is seen as a serious problem. The last part of the chapter outlines the objectives of the study.

In Chapter II the historical factors characterizing the land question in Kenya, as it relates to wildlife, are placed in the theoretical setting of S. B. Jones' unified field theory model. This provides a test for the Jones "model" and a systematic conceptualization of the temporal data. The model's idea-area chain proves very useful in tracing the evolution of wildlife conservation areas in East Africa. Conservation areas are seen to be more than merely administrative units; they become political areas within the state, generating their own circulation fields, pressures, and modifications of the underlying idea. The

resources of conservation areas come to represent one thing to the state, and another to the people living in or near them.

Chapter III is a functional analysis of the contemporary wildlife conservation system in Kenya. The system is a complex one in which a variety of agencies and interest groups share in the control of conservation areas. The administration of hunting and the economic benefits derived from the industry are outlined and the allocation of wildlife resources is discussed. Salient problems confronting Kenya's wildlife conservation areas are investigated, and two categories of problems recognized. Management problems include those involving primarily ecological considerations, and those produced by the impact of increasing numbers of visitors to the wildlife areas. Visitor-impact is a problem of growing magnitude in Kenya and has already led to conflict between economic and conservation goals. It is shown that in the case of lodge siting, economic considerations outweigh conservation goals.

Problems of conflict between human and animal interests include poaching, and land-use conflict. Types of poaching and the impact of each are described. Land use conflict appears the most serious long-term threat to the future of wildlife in Kenya. Movement of agricultural peoples into what has formerly been wildlife land is seen as particularly damaging.

Chapter IV presents a case study of such a movement; the migration of pioneer agriculturalists into the dry bushland of southeastern Kenya. This study demonstrates the complexity of the factors involved in migration patterns. Economic factors are

important, but cultural and social forces are also seen to contribute to migration behavior and influence settlement. A form of social organization, the utui system of residence, is of particular interest, influencing both the manner of migration, and the pattern of settlement. This particular migration also demonstrates the profound impact of pioneer agriculture on regional ecology, and particularly on wildlife abundance and distribution.

In the concluding chapter attention is focused on population growth as the basic cause of increasing human impact on wildlife. It is suggested that programs of agricultural development in the traditional areas of settlement will provide a satisfactory solution to human-animal conflict in Kenya. Increased productivity in these densely populated areas promises to reduce the impetus of migration and stem the flow of settlers into wildlife habitats. Conservation organizations are urged to support this effort for the future survival of Kenya's wildlife depends on the solution of this basic conflict.

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FOR LAND IN KENYA:
A GEOGRAPHICAL ANALYSIS

By

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INTRODUCTION

Conservation has become an extremely popular subject of discussion in recent years. A steady stream of articles in the press and popular journals are devoted to environmental issues. We are experiencing a kind of revolution of environmental awareness and words like ecology, ecosystem, and biodegradable have become part of the common vocabulary. Much of this new awareness is focused in the highly industrialized nations of Western Europe and North America, where the environmental impact of modern technology has suddenly become painfully obvious. Indeed, a perusal of recently issued textbooks and other publications dealing with conservation topics might lead one to believe that problems of environmental deterioration are almost entirely confined to the highly developed countries of the western world. This is far from the case, however. Throughout all parts of the world man's activities are altering, and often degrading, natural environments. The intensity of man's environmental impact may vary between different regions of the earth but the whole world is, in one way or another, involved in the environmental crisis. This study will examine an environmental problem in a non-western setting; the competition for land between man and wildlife in Kenya, which threatens one of the nation's most valuable natural resources.

Kenya, like many of its African neighbors, possesses a very limited resource base. The country lacks major exploitable mineral resources and good agricultural land is scarce. Much of northern and eastern Kenya is too dry to support any agriculture

at all. In fact, over half of Kenya's land area is classified as desert or semi-desert. Kenya does, however, have one unique, and economically valuable resource, wild animals. Kenya's wildlife resource is spectacular both in variety and in abundance. This small country contains one of the last great concentrations of wildlife remaining anywhere in the world. The economic value of this unique resource is realized through game viewing, principally by foreign visitors. The tourist industry, based primarily on game viewing, is already the nation's leading earner of foreign exchange and the potential for future growth is excellent.

Wildlife conservation in Kenya is chiefly implemented through an elaborate system of National Parks, Game Reserves and other types of sanctuaries. Although the system would appear to be adequate to protect the nation's wildlife there are many problems confronting the conservation system today. Chief among these is the growing competition from other forms of land-use. Kenya's human population is increasing at an unprecedented rate, close to 3% a year according to a recent estimate¹, and will double in size in less than 25 years. This expanding population has already begun to come into conflict with wildlife as men move out of the traditional areas of settlement in search of new land for cultivation and grazing. This population movement has brought human settlement into areas that have long been occupied exclusively by wild animals. The competition resulting from this movement threatens the future survival of Kenya's spectacular wildlife resources.

¹United Nations Demographic Yearbook, 1969, p. 116.

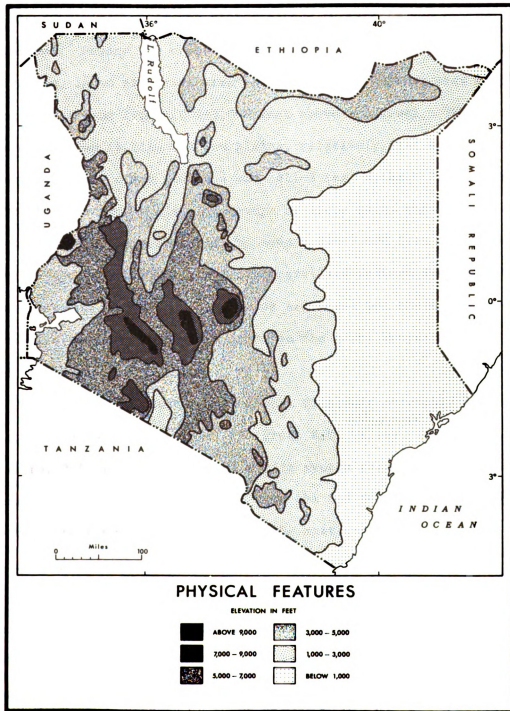
CHAPTER I

BACKGROUND AND OBJECTIVES

Kenya is one of five political units that occupy the region of highland East Africa. The total area of the country is just under 225,000 square miles. A compact territory, Kenya lies astride the equator, stretching a little over four degrees of latitude north and south of the equator and from 34 to 42 degrees of east longitude. The dominant physical characteristic of the whole region is the East African Plateau which reaches elevations of 7,000 feet in some sections of Kenya and lies at an elevation of 3,000 feet above sea level over most of its area (see Map 1.1).

Physiography. The physiography of Kenya and East Africa as a whole has been described by several writers, African as well as European.¹ For present purposes a brief description of Kenya's salient physical features will suffice. As is true of much of the African continent, Kenya possesses only a very narrow strip of true coastal plain. The coastal zone below 200 feet above sea level, which can be described as coastal plain, extends only 40 miles inland at its widest point and is but 10 miles in width over most of its length. Inland from the coast the land rises gradually in a series

¹E. P. Saggerson, "Physiography of East Africa," The Natural Resources of East Africa, ed. E.W. Russell (Nairobi: East African Literature Bureau, 1962), pp. 48-51 gives a brief overview of the subject. A much more detailed and valuable treatment, confined to the physiography of Kenya, is F. F. Ojany, "The Physique of Kenya: A Contribution in Landscape Analysis," Annals of the Association of American Geographers, Vol. LVI, No. 2 (June, 1966), pp. 183-96.



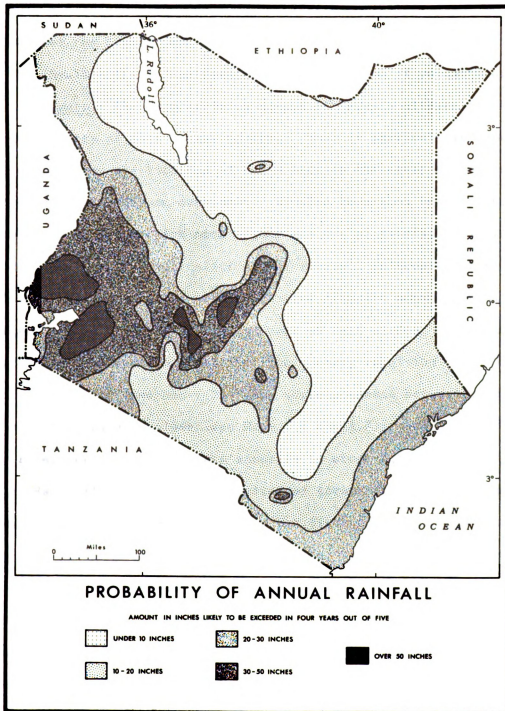
Map 1.1

Physical Features

Generalized after Directorate of Overseas Surveys, D.O.S. (Misc.) 299B, map accompanying The Natural Resources of East Africa, ed. E. W. Russell (Nairobi: East African Literature Bureau, 1962).

of steps culminating in the high plateau surface of the central highlands. Beyond the coastal zone, between 500 and 1,000 feet in elevation, is an extensive area of low plains. Another area of plains stretches inland from 1,000-3,000 feet above sea level. This low plateau region is, like the low plains, relatively flat and dry and the two regions are often combined and called the "Nyika." Along the 3,000-foot contour a distinct change of slope marks the edge of an intermediate plateau that lies between 3,000-5,000 feet above sea level. The high plateau areas of central and western Kenya generally range between 5,000-7,000 feet above sea level but there are some extensive areas of higher elevation in the Mount Kenya-Aberdare region and in the western highlands.

Through the center of the Kenya Highlands stretches East Africa's most unique physical feature, the great Rift Valley. The Kenya, or Eastern, Rift Valley is part of a rift system that runs the entire length of the African continent, from the Red Sea to Swaziland in the south. The Kenya section, probably the most spectacular part of the rift system, is about 50 miles wide where it passes through the highlands. From the plateau surface the land falls steeply, several thousand feet to the flat valley floor. Across the valley the rift wall marking the opposite fault can be seen. There is considerable variation in the elevation of the rift floor in Kenya and the valley contains volcanic cones such as Mount Longonot, as well. Volcanic activity has left its mark throughout Kenya, particularly in the form of the great extinct volcanoes that rise above the plateau surface. Mount Kenya, rising to 17,058 feet, and Mount Elgon on the Kenya-Uganda border, at 14,172 feet, are the highest mountains in Kenya



Map 1.2

Probability of Annual Rainfall

Generalized after Directorate of Overseas Surveys, D.O.S. (Misc.) 299D, map accompanying The Natural Resources of East Africa, ed. E. W. Russell (Nairobi: East African Literature Bureau, 1962).

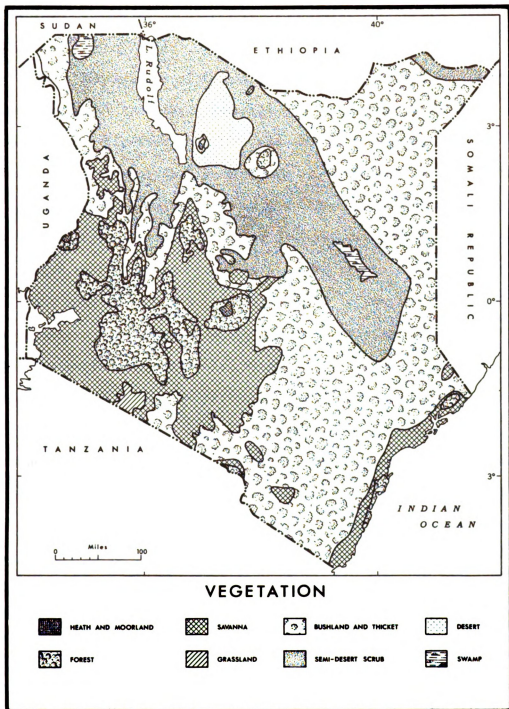
and just across the border to the south lies Mount Kilimanjaro, at 19,340 feet the highest mountain in Africa. The Aberdare Mountains and the Chyulu Hills in southeastern Kenya are also of volcanic origin.

Climate. The most striking aspect of Kenya's climate is the extreme aridity of most of the country. This is particularly remarkable considering the location of Kenya astride the equator, on the east side of the African continent. Similar locations on other continental land masses receive much higher amounts of rainfall. Trewartha has described the general deficiency of rainfall in tropical East Africa as "undoubtedly the most impressive climatic anomaly in all of Africa."² Kenya is much the driest part of East Africa, with only part of the southwestern quarter of the country receiving over 30" of rainfall annually (see Map 1.2). The correspondence between rainfall and elevation is very close (see Maps 1.1 and 1.2); almost all of the area receiving over 30" of rain annually is above 5,000 feet.

Rainfall is the climatic factor of greatest significance in Kenya, much of the country receiving too little for sustained agriculture. Not only is total rainfall low but variability is very high. Map 1.2 shows the minimum annual rainfall that can be expected in four years out of five -- a much more reliable measure of moisture conditions in Kenya than average annual rainfall. The map shows that only a very small area of the country receives a reliable 30" annual rainfall and that the greater part of Kenya receives less than 20". In fact, 85% of Kenya's land area has a reliable annual rainfall of less than 30",³

²G. T. Trewartha, The Earth's Problem Climates (Madison, Wisc.: University of Wisconsin Press, 1961), p. 121.

³J. F. Griffiths, "The Climate of East Africa," The Natural Resources of East Africa, p. 79.



Map 1.3

Vegetation

Generalized after Directorate of Overseas Surveys, D.O.S. (Misc.) 299E, map accompanying The Natural Resources of East Africa, ed. E. W. Russell (Nairobi: East African Literature Bureau, 1962).

the minimum considered necessary for successful agriculture without irrigation.

The effectiveness of rainfall in Kenya is related to its distribution throughout the year. Rainfall that is concentrated in one rainy season is more effective than the same amount of rainfall divided between two rainy seasons. As moisture is the major limiting factor for agriculture in Kenya this means that the rainfall minimum necessary for successful farming in areas with two rainy seasons will be higher than that required with single-season rainfall.

The seasonal distribution of rainfall in Kenya varies widely. In the western part of the country, near Lake Victoria, a single rainy season lasts virtually all year, with 11 or 12 months recording a minimum of 2" of rain. The extreme northern and northeastern regions also have a single rainy season, but a much shorter one, lasting for just one month, April. Most of southern and southeastern Kenya and the southern part of the central highlands exhibits the classic equatorial two-season rainfall pattern. The two rainy seasons vary slightly in timing but they generally last from late March to May and from late October to December.⁴

Vegetation. The wide differences in amount, reliability, and seasonal distribution of rainfall in Kenya, together with the great variation in elevation have produced regions of sharply contrasting environment that can be clearly defined by the different types of vegetation characteristic of each.⁵

⁴Ibid., pp. 79-82

⁵D. C. Edwards, "The Ecological Regions of Kenya: Their Classifications in Relation to Agricultural Development," Empire Journal of Experimental Agriculture, Vol. XXIV (1956), p. 89.



Figure 1.1 The grassland vegetation of the Mara Plains in western Kenya supports large herds of wild grazing animals.

Forest vegetation in Kenya is confined primarily to areas of higher elevation, above 5,000 feet. On the higher mountains alpine and sub-alpine vegetation (called Heath and Moorland on Map 1.3) comprise the highest vegetation zone, above 10,000 feet. Below 10,000 feet a zone of mountain bamboo is common, and below 8,000 feet is found the montane forest. The forest is predominantly evergreen and occurs generally where rainfall reaches 60-80 inches, although drier mountain forests do occur in some parts of Kenya where rainfall is as low as 30 inches. Dry semi-deciduous lowland forests are also found in a few areas of Kenya, notably in the Nairobi region, with a rainfall of 35-40 inches.

Savanna, tall grass with scattered trees and shrubs, is characteristic of the plateau area of southwestern Kenya above 3,000 feet, with rainfall of about 20 inches. The southern part of the Kenya savanna zone is composed of Acacia savanna with its distinctive flat-topped Acacia trees. Most of the varieties of savanna vegetation found in Kenya are subject to frequent grass fires and appear to be fire-induced vegetation types.

By far the most common types of vegetation in Kenya are the dry bushland and thornscrub associations that cover the vast areas of the country receiving less than 20 inches of annual rainfall. The bushland and thicket vegetation is composed of an often dense stand of small trees and shrubs with a thin grass ground cover. Semi-desert scrub is characterized by bushes and dwarf shrubs widely spaced over the ground, which carries only a very sparse grass cover.⁶

⁶C. G. Trapnell and I. Langdale-Brown, "The Natural Vegetation of East Africa," The Natural Resources of East Africa, pp. 92-102.



Figure 1.2 Semi-arid bushland vegetation in southeastern Kenya. This photograph shows an elephant in Acacia-Commiphera bush in Tsavo National Park.

Wildlife. Kenya's varied environments support an incredible variety of wild animals, and although wildlife populations have been substantially reduced in modern times, game can still be seen in spectacular abundance in some areas. There are 57 prominent mammal species in Kenya. Among these are 33 species of horned animals, such as buffalo, kudu, gazelles, and other antelopes; 12 large carnivores including lion, leopard, hyena, and aardwolf; as well as other important species like rhinoceros, elephant, and giraffe. In addition to these large mammals there are many smaller mammals, and a very rich bird life.⁷

The herbivores, the most numerous of Kenya's wild animals, depend on vegetation for survival, and may be classified according to their food preferences. Some species like the buffalo, zebra, wildebeest, and Thomson's gazelle are entirely or almost entirely grazers. Other species such as giraffe, kudu, bushbuck, and black rhinoceros are entirely or almost entirely browsers. And there are some species that are mixed feeders, consuming grass and shrubs; among these are the impala, reedbuck, and sable and roan antelopes. Within these very broad groupings each species differs in precise food requirements, each preferring different plant species or different growth stages of the same plants.

The specific habitat requirements of the different wild animal species tend to limit most species to particular vegetation types that provide the food and other resources necessary to their survival.

⁷G A. Petrides, Kenya's Wild-Life Resource and the National Parks (Nairobi: Trustees of the Royal National Parks of Kenya, 1955), p. 5.



Figure 1.3 Montane forest on the slopes of Mt. Kenya at approximately 10,000 feet above sea level.

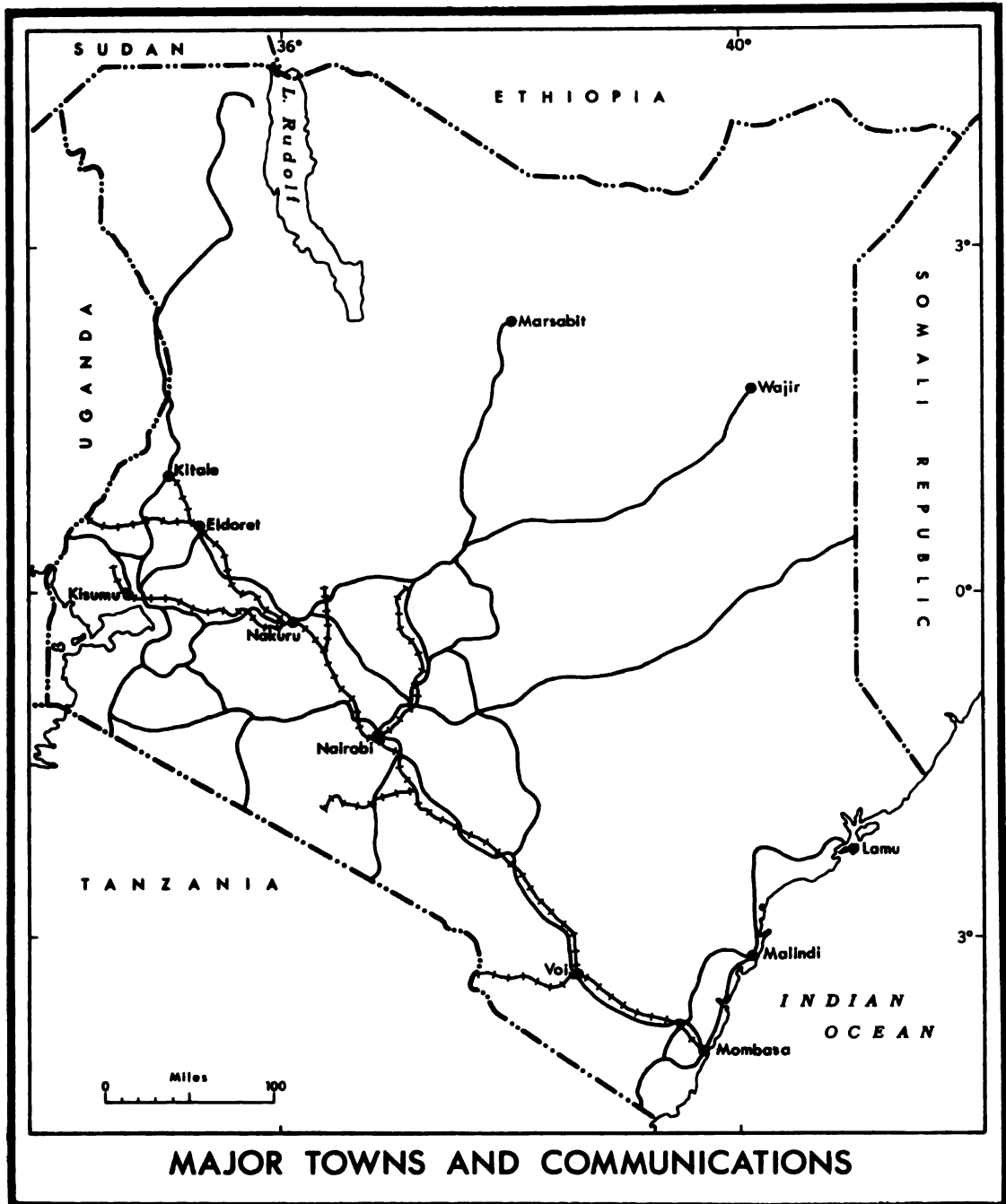
In Kenya, three distinct wildlife vegetation types can be distinguished: (1) bushland, (2) savanna and grassland, and (3) forest.⁸

The vast area of dry thornscrub vegetation supports large numbers of elephant, especially in southeastern Kenya, and is the principal habitat of the black rhinoceros. Other animals common to this vegetation type are impala, oryx, lesser kudu, Grant's gazelle, and gerenuk. The savanna and grassland vegetation type is the most productive of Kenya's wildlife habitats, supporting large herds of zebra, wildebeest, kongoni, topi, and gazelles as well as smaller numbers of other antelope and giraffe. The forest areas, especially the montane forests, provide habitats for some of the less common species like the rare bongo and forest hog, mountain reedbuck, duikers, and monkeys. The forests are also occupied by many species which are also found in other areas: elephant, rhino, buffalo, leopard, and others.

Wild animals in Kenya, although diminished in recent years, are still well distributed in suitable habitats and have survived in sufficient numbers to make the wildlife resources of this small, but fortunate, country one of the world's great natural spectacles. But the future of this magnificent natural resource is uncertain, threatened by the rapid growth and expansion of the human population with which it shares the land.

Kenya's human population has always been very unevenly distributed, with most of the people concentrated in the better-watered areas of the high plateau in the southwest. With the exception of the coastal zone and a few other small pockets of high density, the rest

⁸Ibid., pp. 7-10

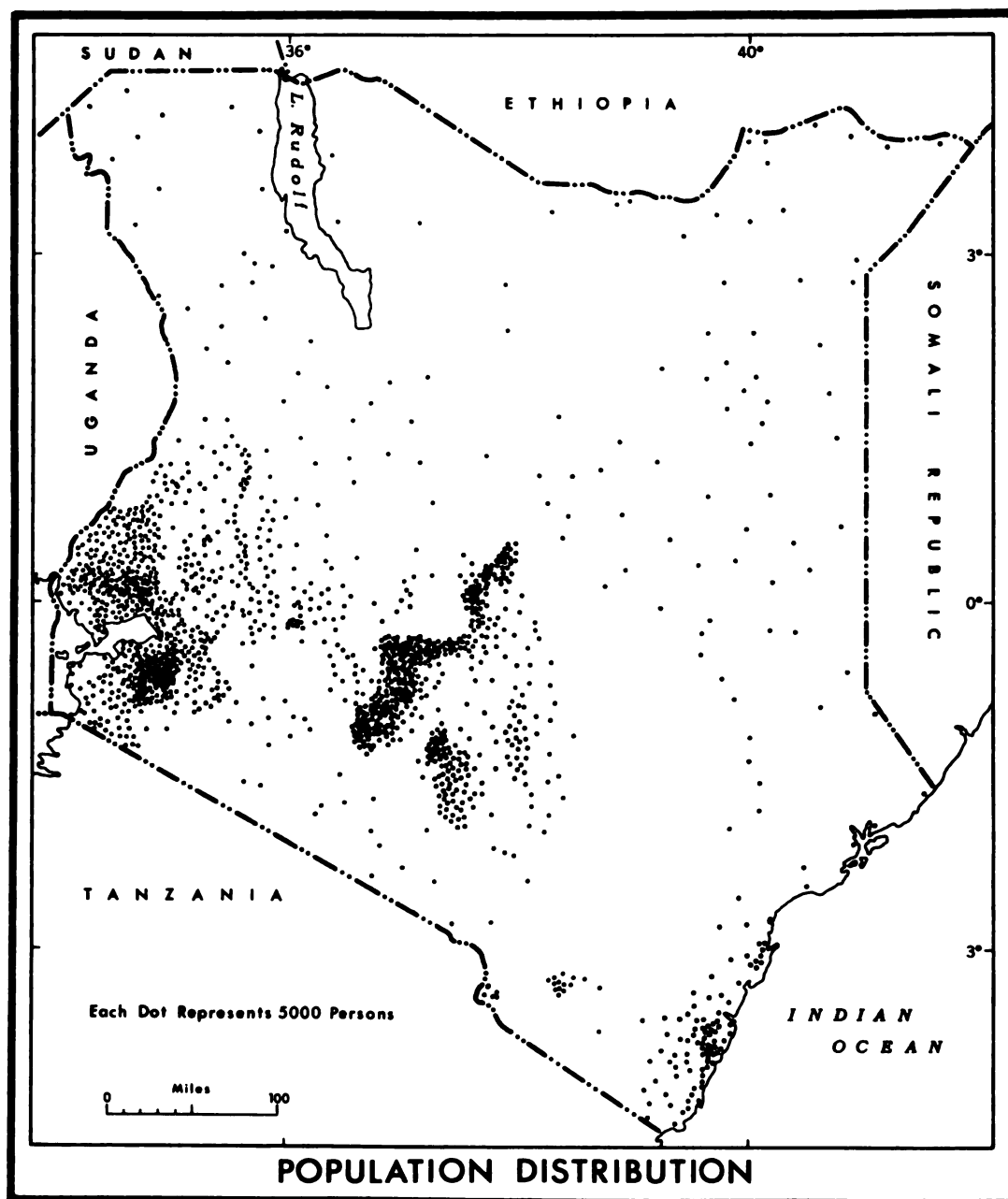


Map 1.4

Major Towns and Communications

of the country is very sparsely populated (see Map 1.5). Even the more modern forms of human activity, urbanization, transportation, and communication, have been developed in a relatively restricted area. The concentration of human activity in a small part of Kenya's total area has meant that much of the country's natural vegetation and the animal life it supports has not yet been subjected to the more intensive forms of human occupancy and alteration. In the past there has always been room for wildlife, in the sparsely populated bushland, in the mountain forests and the patches of dense bush that remained amidst cultivated land, and on the savanna grasslands, shared with pastoralists' cattle. But today Kenya's human population is growing at an unprecedented rate and people are increasingly coming into conflict with wild animals as they compete for living space and resources. Competition for land between men and animals is already a serious problem in some areas of wildlife abundance, and the future growth and development of human activities in Kenya can only intensify this competition.

Objectives of the Study. This study seeks to approach the complex problem of competitive land occupancy in Kenya from several directions. The geographic context of the issue is manifest; it involves land use, land pressure, migration, allocation, and several other spatially-expressed phenomena. But the field phase of research soon confirmed the elusiveness of hard data that is apparent from the meager literature. Additionally, the problem is being magnified by several precipitous developments that have occurred (and are still progressing) during the last several years. It is hardly possible to view the question of land competition in Kenya without continuous



Map 1.5

Population Distribution

Source: Population distribution after C. G. Rosberg, Jr and J. Nottingham, The Myth of "Mau-Mau": Nationalism in Kenya (New York: Praeger, 1966). Map in rear pocket.

reference to the political circumstances in a country whose very independence was, in large measure, the result of a crisis over land and the rights of settlement. Independence having been a recent achievement, the adjustments of what van Valkenburg referred to as the youthful stage of national development are now perhaps at the height of intensity, and the overriding impression that emerges is one of change, rapid change.⁹

This generates the difficult question of whether the issues raised in this study can be related in any meaningful way to some fundamental conceptual constructs in geography. Some two decades ago R. Hartshorne proposed that political geographers adopt a more functional approach to their problem-solving, an appeal that might have been directed to other areas of the discipline as well.¹⁰ Certainly it is necessary to place the present study in the context of Kenya's wildlife management system and its functional properties, but this phase of the work, as will be seen, is essentially contemporary. What Hartshorne's suggestion lacked was a mechanism to include the relevant evolutionary qualities of a functioning political region. It was S. B. Jones who filled this gap several years later with a statement relating to field theory in political geography, a

⁹ S. van Valkenburg, Elements of Political Geography (New York: Prentice-Hall, 1939), p. 5. The youthful stage is one of "internal organization . . . the consolidation of internal structure." In Systematic Political Geography (New York: John Wiley & Sons, 1967) H. J. de Blij proposed the term organizing as a substitute for youthful, since the process rather than the chronology is the critical issue (p. 103).

¹⁰ R. Hartshorne, "The Functional Approach in Political Geography," Annals of the Association of American Geographers, Vol. XL, No. 2 (June, 1950), pp. 95-130.

statement that could also have wider application than to political geography alone.¹¹ In the following chapter, therefore, the historical factors characterizing the land question in Kenya (as it relates to wildlife conservation) are placed in the theoretical setting put forward by Jones. This procedure provides both a test for the Jones "model" and a systematic conceptualization of the temporal data.

A second objective of this study is a functional analysis of Kenya's wildlife conservation system, with an emphasis on spatial ramifications. The usefulness of this approach is substantiated by the recognition of the intense complexity of the system itself, a complexity which plays a role in producing several of the salient problems identified in Chapter III. For a variety of reasons, the administration of Kenya's wildlife areas is a difficult matter. Areas set aside for total protection adjoin other areas where hunting may take place and animals migrate without regard for the appropriateness of man-perceived boundaries. Poaching affects much of Kenya's fauna, and the system can only partially cope with it. Destruction of wildlife habitats by pioneer settlers who penetrate the wilderness poses still another threat. Superimposed upon all this are uncertainties about the appropriateness of population control policies to be applied to wild animals. Indeed, even the numbers, distribution, and migration patterns of some species is uncertain.

The third goal of this study involves a redefinition of scale. The broad problem of land competition having been identified, it is instructive to examine this matter at the case-study level.

¹¹S. B. Jones, "A Unified Field Theory of Political Geography," Annals of the Association of American Geographers, Vol. XLIV, No. 2 (June, 1954), pp. 111-23.

Kenya would not seem to be an overpopulated territory, and yet people move into marginally usable land. What leads to their decision to do so? What are the consequences? What is the impact on the wildlife populations of such areas, which have hitherto been beyond the fringes of pioneer settlement? In Chapter IV, a representative case (in Machakos District) is examined in detail to seek answers to these questions and to gauge the potential threat to other areas in Kenya facing similar pressures.

CHAPTER II

COLONIAL BEGINNINGS TO MODERN PROBLEMS: AN APPLICATION OF FIELD THEORY TO THE EVOLUTION OF WILDLIFE CONSERVATION AREAS IN EAST AFRICA

Like many other countries in Africa and the remainder of the developing world, the young states of East Africa are presently reorganizing their political structures and reorienting their economies to reflect new goals and aspirations. In the political arena the conditions under which independence was achieved have already been greatly modified and the trend toward the one-party state prevails. Tanzania has already attained one-party status; in Kenya the government party reigns supreme with the organized opposition losing strength rapidly under heavy pressure; and in Uganda the traditionalist Buganda Kingdom, which extracted federal guarantees at independence, has seen its power and influence submerged in a nationalist revolution that came after independence had been achieved.¹ In the economic sphere the three East African states also have chosen individual directions designed to meet their differing needs and development problems. The central concern for each of the three republics is land and the policies relating to its ownership. Half a century of British colonial administration left Tanzania, Uganda, and Kenya with a body of laws and attitudes which reflected alien as well as African objectives.

¹Crawford M. Young, "The Obote Revolution," Africa Report, Vol. XI (1966), pp. 8-14. It is possible that the trend in Uganda will be somewhat delayed by the coup which ousted Obote in 1970.

Tanzania has implemented a communalization program in which freehold tenure has been replaced by leasehold tenure; land in effect became the property of the state, and farmers were organized into multi-tribal cooperative villages under the control of party and government.² Uganda decided on a policy of tribal autonomy in regard to the question of land ownership, which in principle means that different forms of land tenure prevail in various parts of the country. And Kenya, where the land issue helped provoke the Mau Mau revolt of the 1950's, has witnessed the end of racial restrictions on land ownership. In the fertile and productive Highlands European estates were vacated and became available for African use. Even before independence, a successful program of land reform and consolidation was in progress, and today Kenya's hopes for agricultural development rest, in contrast to Tanzania, upon a large and productive base of African smallholders.³

Land is the chief concern for the overwhelming majority of East Africans, whether it is owned by the state, by national groups, or by individuals. All of the East African states depend for most of their external trade, as well as for local subsistence, upon agricultural products; mineral resources being of minor importance in the total economic picture. It was land that drew European settlers to the region, and land policies became the central political issue during the colonial period.⁴ It is not surprising that land was a

²F. Burke, "Tanzania's Search for a Viable Rural Settlement Policy," Proceedings, 1967 Annual Meeting of the African Studies Association of the United Kingdom, London, 1967.

³Aaron Segal, "The Politics of Land in East Africa," Africa Report, Vol. XII (1967), pp. 46-50.

⁴The importance of the land question in Kenya during the colonial period and the central role of land grievances in the development of African nationalism in that country is convincingly documented

major theme of African politicians as the colonial period drew to a close, and the hopes of land-hungry people were sometimes falsely raised that independence and the end of British rule would bring an immediate solution to existing land problems. Among outsiders unsympathetic to independent, African-ruled, states it became fashionable to predict that the rich and commercially productive Kenya Highlands would revert to nonremunerative subsistence agriculture, and that East Africa's magnificent wildlife heritage would be destroyed by the encroachment of tribal peoples and their livestock. Wildlife conservation, it is true, had been a completely foreign innovation in black Africa and the colonial period had seen African peoples deprived of the use of their land in the interests of protecting wild animals.

Since independence the pressures on wildlife conservation areas in East Africa have been severe and in some cases damaging. Among these pressures have been demands for farm land, the activities of hunters and poachers, and the impact of pastoralism on fragile grasslands. But, contrary to pre-independence fears, African governments have in fact strengthened conservation policies. Furthermore, they have had to face issues which colonial governments, by virtue of their imposed, non-consent nature, could conveniently submerge and ignore. In the years since independence, tourism, almost all of it based on the attraction of the region's wildlife, has undergone rapid growth. Kenya's foreign exchange earnings from the tourist industry were estimated at \$20 million in 1964 and had more than doubled by 1968, when

in C. G. Rosberg, Jr. and J. Nottingham, The Myth of "Mau Mau": Nationalism in Kenya (New York: Praeger, 1966).

they amounted to almost \$46 million.⁵ Indeed, far from permitting the destruction of their wildlife heritage, the governments of East Africa have recognized its great value and have willingly accepted the responsibilities involved in its protection. Scarce development capital is being made available to prepare for future growth. Large financial investments are being made; game lodges are under construction; roads are being improved and new roads built; park fences are being erected; and the administration and operation of the wildlife sanctuaries is being improved. In addition to financial outlay political and social investments have also had to be made; encroachment on wildlife reserves has been resisted by force, squatters have been evicted, notably from the Serengeti, and laws regarding poaching and illegal hunting have been made even tighter than was the rule under British administration. This can be a sensitive matter, for an African farmer who sees a licensed European hunter kill an elephant and is then arrested for killing a buck for its meat, and on what he regards as his traditional hunting ground, is apt to think little of the rewards of independence.

This chapter focuses on a politico-geographical aspect of the wildlife conservation system in East Africa. The emergence of Kenya as an independent state, with nearly ten per cent of its territory set aside as wildlife conservation areas, endowed the country with two sets of boundary and territorial problems, international and internal. In tracing the complex origins of Kenya's national parks and game reserves, the decisions that defined and delimited them, their

⁵ Joseph P. B. M. Ouma, Evolution of Tourism in East Africa (1900-2000) (Nairobi: East African Literature Bureau, 1970), p. 31.

frequent revisions, the disruption of established migration patterns and the creation of new ones, and the continuing spatial adjustments that resulted from these circumstances, it was recognized that the prominent hubs of activity being recorded were directly related to the constituents of the unified field theory model proposed by S. B. Jones.⁶ Although the field theory model's most direct application is to the evolution of a total political area, its usefulness in the context of an internal, lower order of organized space can, it is believed, be demonstrated.⁷

The unified field theory model is also known as the idea-area chain because idea and area are the first and last of its five stages, with decision, movement, and field intervening. The first question that arises is whether the idea of wildlife conservation, in its African setting, has any political relevance. The concept was, of course, entirely alien to the region where it was introduced by Europeans. Not only was the concept of wildlife conservation unknown, the idea of single-purpose allocation of land was also foreign to the cultures upon which it was imposed. Wildlife conservation was, however, much more than a humanitarian principle when the idea was being debated, late in the 19th century. The British East Africa Company, struggling to administer and develop their vast African domain, was impoverished and in need of support at home and increased revenue in

⁶S. B. Jones, op. cit.

⁷For an example of the model's application to the evolution of a total political area, see H. J. de Blij, "Uganda and the Problem of Politics," in A Geography of Subsaharan Africa (Chicago: Rand McNally, 1964), pp. 264-77.

East Africa. Politically the promise of the preservation of a great natural heritage served to generate favorable public opinion in England and economically the income potential from controlled hunting promised to ease the company's strained finances. It was fitting that Europeans took the first organized steps to preserve wildlife in East Africa, for they had themselves produced the threat that made conservation necessary.

When Europeans first arrived on the East African plateau late in the 19th century they found wildlife in staggering numbers. Although we have no reliable records of animal numbers in East Africa before the turn of the century we can arrive at the general magnitude of the game herds by extrapolation from estimates of game populations made in the early years of the 20th century. The first systematic counts of wild animal numbers in East Africa were made by Meinertzhagen, an enthusiastic hunter and trained naturalist. In 1902 when, according to old timers in Kenya, the game herds had already been greatly reduced, Meinertzhagen counted the game observed south of the railway line between Athi River and Nairobi, a distance of less than twenty miles. He recorded:⁸

5 rhinoceros	142 Thomson's gazelle
18 giraffe	46 impala
760 wildebeeste	24 ostrich
4006 zebra	7 greater bustard
845 hartebeeste	16 baboon
324 Grant's gazelle	

Meinertzhagen's first game census was conducted on May 18, 1902; later

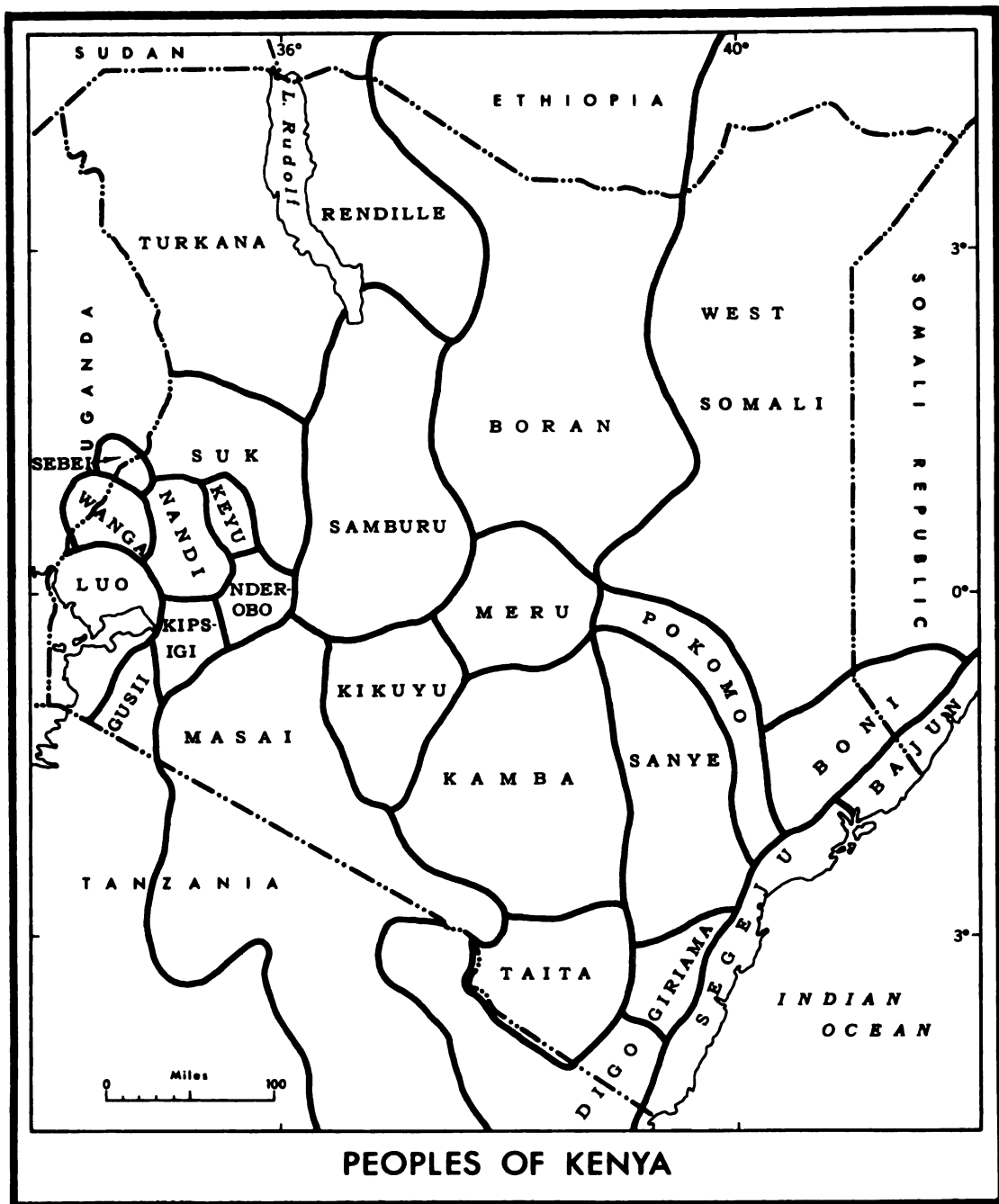
⁸Colonel R. Meinertzhagen, Kenya Diary 1902-1906 (London: Oliver and Boyd, 1957), pp. 5-6.

that year, on July 8, he counted the game on a ten square mile area of the Athi Plains, south of Nairobi, and recorded:⁹

2430 zebra	8 steinbok
967 wildebeeste	2 duiker
846 hartebeeste	46 eland
932 Grant's gazelle	19 giraffe
546 Thomson's gazelle	1 rhinoceros
146 impala	86 ostrich
1 cheetah	5 hyena
7 hunting dogs	

As impressive as these concentrations of game were, wild animals were apparently much less numerous than twenty years earlier when Europeans first viewed the wildlife of the plateau. At that time the vast herds of game animals covered the grasslands and it must have seemed to early observers as if this magnificent natural resource was inexhaustible. The great game herds quickly drew European hunters, both amateur and professional, to East Africa. Professional ivory hunters were soon causing substantial reductions in elephant populations and amateur hunters were beginning to have a significant impact on other game animal populations. The amateur "sportsmen" hunting in East Africa were interested both in the quality of their trophies and the quantity of game shot. There were no limits on the number of animals that could be shot and it became common practice to shoot large numbers of each species in hopes of getting one good trophy head. The size of each hunter's bag was also a source of pride and many animals were shot simply to add to the tally. It was also customary for large hunting safaris to live off the land and, as it was not unusual for a large party to employ a hundred or more porters, the amount of game

⁹Ibid., p. 13.



Map 2.1

Peoples of Kenya

Modified after G. P. Murdock, Africa -- Its Peoples and Their Culture History (New York: McGraw-Hill, 1959). Map in rear pocket.

required for food could be enormous. By 1894 concern was already being expressed about the decline in wild animal numbers in East Africa and suggestions were being made that some kind of control measures might be necessary to preserve wildlife.¹⁰

The conservation idea in East Africa received its first official expression in the British East Africa Company's "Sporting Licenses Regulation of the 5th September, 1894," which proposed hunting restrictions and bag limits, regulating the number of kills that might be made on each license. As much of the best hunting country lay in African tribal lands (see Map 2.1) the Regulation stipulated that its application should be relaxed toward African hunters.¹¹ It was not in Kenya, however, but in what is today mainland Tanzania where the first real wildlife sanctuaries in East Africa were created. This pioneering achievement was largely due to the effort of von Wissman who, as Germany's Imperial Commissioner in East Africa, apparently made the earliest appeals for such action. His recommendations were reported to Foreign Secretary Salisbury in 1896 by Gosselin, the British representative in Berlin.¹² Mainly as a result of von Wissman's proposals, there were two large wildlife conservation areas in German East Africa by late 1896. The Northern Reserve extended from the Masai Steppe south of Mt. Kilimanjaro to the present-day Serengeti

¹⁰Sir Harry Johnston, quoted in Noel Simon, Between the Sunlight and the Thunder: The Wildlife of Kenya (London: Collins, 1962), p. 33.

¹¹Great Britain, Parliamentary Papers, Vol XL, 1898 (Africa, No. 7), Command 8683, p. 641.

¹²Great Britain, Parliamentary Papers, Vol LXXIX, 1906 (Africa, No. 58), Command 3189, "Correspondence Relating to the Preservation of Wild Animals in Africa" (November, 1906), pp. 2-3.

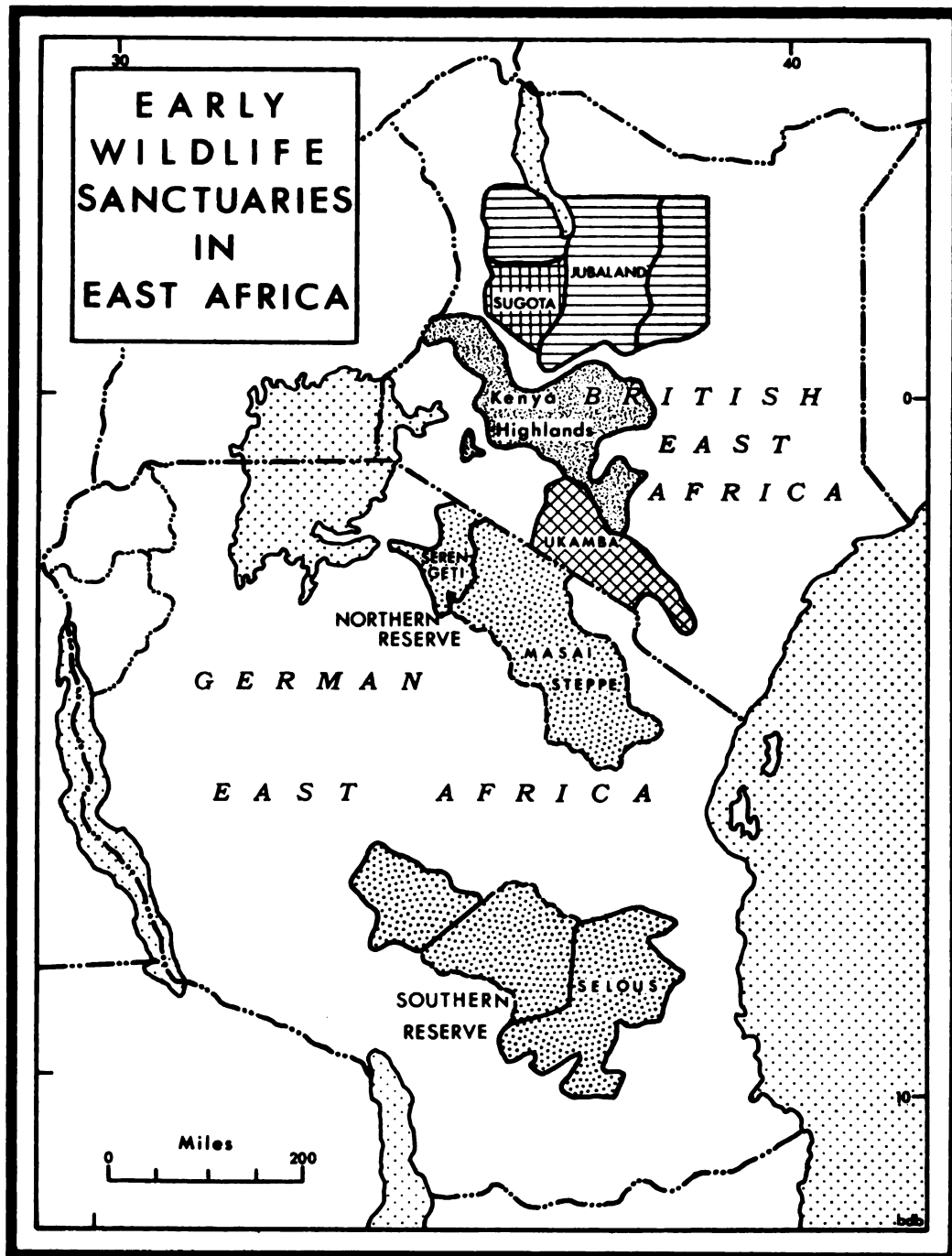
and the Southern Reserve coincided largely with the modern Selous Game Reserve (see Map 2.2). In British East Africa, it was proposed by Sir John Kirk that "large wild game preserve areas" be created, and Frederick C. Selous, one of Africa's most famous hunters, advocated the introduction of closed seasons on all species and additional reserves where no hunting of any kind would be permitted, in a statement to the Foreign Office in 1897.¹³ It is remarkable that these early expressions of the conservation idea demonstrate an extraordinary lack of knowledge regarding some basic questions, such as the space requirements of truly viable ecological units. More importantly they show an apparent lack of concern for the African peoples whose lands were being considered as desirable areas for the establishment of wildlife sanctuaries. Although they were undoubtedly unaware of the future consequences of their actions these early conservationists were sowing the seeds of political trouble.

From Idea to Decision: The Convention of 1900

In response to the growing concern over the destruction of wildlife in Africa an international conference was convened in London in 1900 which was attended by representatives of the colonial powers with African dependencies. All the governments concerned shared an interest in the large-scale implementation of the conservation idea and among the articles included in the resulting convention were two which read as follows:¹⁴

¹³ Ibid., pp. 42-44.

¹⁴ Ibid., pp. 86-91.



Map 2.2

Early Wildlife Sanctuaries in East Africa

Sources: For British East Africa: Parliamentary Papers, Vol. LXXIX, 1906 (Africa, No. 58), Command 3189, p. 39. For German East Africa: Ibid., pp. 2-3 and 34-36. The modern boundary framework is superimposed for reference.

- II. [The signatories favor the] establishment, as far as it is possible, of reserves within which it shall be unlawful to hunt, capture, or kill any bird or other wild animal except those which shall be specially exempted from protection by the local authorities.

By the term "reserves" are to be understood sufficiently large tracts of land which have all the qualifications necessary as regards food, water, and, if possible, salt, for preserving birds or other wild animals and for affording them the necessary quiet during the breeding time.

- III. The contracting parties undertake to . . . communicate . . . within 18 months giving information as to areas which may be established as reserves.

In British East Africa the London Convention led directly to the consolidation of one game reserve and the definition and delimitation of several others. The newly consolidated reserve was the "whole of the Kenia District of Ukamba Province, except the area within 10 miles around the Government Station at Kikuyu."¹⁵ A comparison of Maps 2.1 and 2.2 shows that this reserve incorporated a large part of the land of the Kamba and the Masai. The newly delimited conservation areas included a northern reserve that was an expanded version of the Sugota Reserve, which had been proclaimed unofficially and without sanction by Sir Harry Johnston in 1900.¹⁶ New sanctuaries were also created in the Aberdare and Mt. Kenya areas north of Nairobi.¹⁷ In Britain, influential organizations took up the cause of wildlife conservation and pressed for expansion and improvement of East Africa's

¹⁵Ibid., p. 59.

¹⁶Great Britain, Parliamentary Papers, 1906, op. cit., No. 67, pp. 113-14

¹⁷Great Britain, Parliamentary Papers, 1906, op. cit., No. 116, pp. 173.

game sanctuaries. In 1905 the Society for the Preservation of the Fauna of the Empire, in a deputation to Colonial Secretary Lyttleton, called for the establishment of additional reserves.¹⁸ On March 23, 1906 the Zoological Society of London sent a communication to the Colonial Office demanding that restrictions be placed on human settlement in wildlife conservation areas, the first time that this important issue was raised.¹⁹

As Jones has stated, the links in the idea-area chain are not separate but "interconnect at one level, so that whatever enters one will spread to all the others."²⁰ The decisions that led to the establishment of conservation areas in British East Africa were not always based on an adequate knowledge of the local situation and the advice of Europeans in Kenya was sometimes ignored. It is not surprising that these conservation policies produced problems in Kenya. Interference with local hunting rights on traditional hunting grounds, the interruption of ancient nomadic migration routes, the restriction of settlement to one side of a line demarcated on the ground, were all consequences of the establishment of game sanctuaries and these problems led to demands for a revision of the whole conservation idea. It became increasingly evident, for example, that while complete protection of wildlife could be accomplished in some reserves, there were other areas in which animals would have to share the land with the

¹⁸Great Britain, Parliamentary Papers, 1906, op. cit., No. 181, pp. 249-57.

¹⁹Great Britain, Parliamentary Papers, 1906, op. cit., No. 216, pp. 335-36.

²⁰S. B. Jones, op. cit., p. 115.

National Parks and Reserves

Sources: Survey of Kenya, Kenya Hunting Map, Series SK57B, Edition 1, 1965, and Survey of Kenya, Game Policy Committee Map of Kenya, 1958.

human population. Thus there gradually emerged a concept of a hierarchy of conservation areas; and this idea was one of the central themes of the 1933 Convention Relative to the Preservation of Fauna and Flora in their Natural State, the outcome of an international conservation conference convened, once again, in London.²¹

The Convention of 1933 defined no less than six levels of protection and control for wildlife areas, ranging from the complete protection of "national parks" to the minimum protection afforded by "controlled areas."²² These revisions in the conservation idea naturally had an impact on the disposition of land considered suitable for wildlife sanctuaries. There were, according to the Convention, alternatives other than complete protection or total abandonment of wildlife. In areas where pastoralists drove their livestock, the conservation objective now became the maintenance of an ecological balance; where hunting was an important human activity, control to ensure the survival of adequate numbers of wild animals became the goal. In time it became apparent that the six levels of protection defined in the London Convention were too complex to be administered satisfactorily. The concept of a hierarchy of conservation areas did survive, however, and became a cornerstone of wildlife preservation in East Africa. Kenya today still has three basic categories of

²¹The Convention was amended by the Third International Conference on the Protection of the Fauna and Flora of the Empire (Africa), Bukavu, 1933 (White Paper, Command 5230, 1936); the proceedings are summarized in the Final Act, H.M.S.O., London, 1938.

²²Colony and Protectorate of Kenya, Report of the 1956 Game Policy Committee, Sessional Paper No. 7 of 1957/58 (Nairobi: The Government Printer, 1958), pp. 62-64.

wildlife reserves: the national park, the game reserve, and the game controlled area.²³

Decision and Movement

Kenya's population of ten million people is concentrated in the southwestern quarter of the country, whose core area stretches north and northwestward from Nairobi to Lake Victoria.²⁴ When Europeans first penetrated the interior of Kenya, the Kikuyu dominated the Highlands (although they had temporarily abandoned parts of this area in the late 1890's), and the pastoral Masai grazed their cattle over wide areas of southern Kenya and what is today northern mainland Tanzania. The Kikuyu and the Masai had long contested the border areas between the two peoples, but in 1904 the British forcibly restricted the Masai to two reserves, one in the Laikipia area in the north and a southern reserve of 4,350 square miles south of Nairobi, between the railway line and the boundary with German East Africa. The fragmentation of the Masai domain was unfortunate and violations of the reserve boundaries were frequent. The two reserves were connected by a half-mile wide corridor but this link between the two sections of the Masai soon became so infected with disease that the Veterinary Department was forced to impose a quarantine. This severed the connection between the two reserves and resulted in demands for consolidation of the

²³Colony and Protectorate of Kenya, A Game Policy for Kenya, Sessional Paper No. 1 of 1959/60 (Nairobi: The Government Printer, 1959), p. 1.

²⁴T. J. D. Fair, "A Regional Approach to Economic Development in Kenya," South African Geographical Journal, Vol. XLV (1963), pp. 55-77.



Figure 2.1 Ol Tukai swamp in the Amboseli Game Reserve is the only permanent source of water for a large part of the Amboseli area and is the focus of game concentration in the Reserve. Although included in the proposed stock-free area it is still utilized by Masai cattle and is at the center of the Amboseli controversy.

Masai people. In 1911 a land exchange was made in which the Masai agreed to abandon their northern reserve in exchange for nearly 6,000 square miles of land in the Mara region westward along the border from their southern reserve. An additional 3,700 square miles was added to the reserve the following year to bring the total area of the reserve to about 15,000 square miles.

The reserve that the Masai eventually come to occupy was, of course, much less extensive than their former range (see Map 2.1), and the Masai were certainly not among the beneficiaries of the colonial advent in Kenya. Further, when wildlife conservation decisions were implemented in Kenya the Masai found that they occupied an area of great interest for this purpose. The Masai were not hunters (except to protect their livestock from predators and for certain ceremonial purposes), and although their cattle may have competed with wildlife for grazing and water, they had never been directly responsible for the large-scale destruction of wild animals. With the decision to establish "national reserves" (in the terms of the 1933 London Convention) it appeared to the Masai that further encroachments were being made upon their already shrunken domain. The situation was mitigated somewhat, however, by involving the Masai themselves in the conservation effort. In Masailand, instead of creating national parks which would be controlled by outsiders, so-called game reserves were introduced in Amboseli and Mara (see Map 2.3). In these reserves an attempt was made to make the rewards of conservation directly visible through the collection of revenues from visitors, with the people's own District Council responsible for control and supervision of the reserves. In return, the Masai agreed to exclude all domestic



Figure 2.2 Masai cattle herd within sight of Ol Tukai swamp in the Masai-Amboseli District Council Game Reserve. Symptoms of over-grazing are evident in this picture and are becoming characteristic of much of Amboseli today.

livestock from small sections of both Amboseli and Mara so that these areas might be reserved for the exclusive use of wildlife.

Mara and Amboseli today are examples of the successes and the failures of this sort of cooperative venture between the Nairobi government and the local people. The Masai-Mara Game Reserve is relatively stable and productive of revenues, and the range appears to be in no danger. At Amboseli, however, excessive numbers of cattle are overgrazing the grasslands and causing severe erosion. In a recent Annual Report the Kenya Game Department summarized the problem at Amboseli in these words: ". . . it is to be regretted that no progress was made to secure even an inadequate area for the sole use of wildlife. The [District] Council did not enforce the agreement to exclude domestic stock from the inner sanctuary of 30 square miles and further considerable damage was done to the vegetation."²⁵

The political overtones of the conservation issue, then, are as prominent today, in an independent Kenya, as they were under British colonial rule. In a country composed of many ethnic groups, the government cannot impose unpopular decisions on one group of its people without the risk of arousing the fears of others as well, arguments about the "national interest" notwithstanding. And although the Masai have been subjected to intense criticism for their failures in the Amboseli Reserve, they have not been alone in their opposition to government conservation efforts. The Samburu, for example, are a pastoral people who graze their cattle on the dry rangeland between the northern edge of the Kenya Highlands and the southern end of

²⁵Republic of Kenya, Game Department Annual Reports 1964 and 1965 (Nairobi: The Government Printer, 1967), p. 27.



Figure 2.3 Cattle-induced erosion, Masai-Amboseli District Council Game Reserve. Dust-bowl conditions are spreading in Amboseli, which is in danger of destruction as a prime wildlife sanctuary.

Lake Rudolf. They objected strenuously to attempts to establish a National Park on their land and the Kenya Game Department observed that to press the issue too strongly might endanger future conservation efforts in the area.

The Samburu felt it was unfair that the government should maintain game on their land and yet not share with them the benefits of its exploitation. Should a national park be created this feeling was likely to be exacerbated. Exploitation would still be by an alien body in the shape of the [National Parks Board of] Trustees and as soon as the exclusion of livestock was enforced, as it would have to be, a friction line would develop round the park boundaries and reprisals might well be taken when game "trespassed" onto surrounding land in the course of its seasonal movement . . . the resulting ill-feeling would prejudice all other conservation measures in Samburu District.²⁶

The Samburu eventually softened their opposition to the idea of wildlife conservation and today, through the cooperative principle of the District Council Game Reserve they participate in a conservation area that includes both a Reserve and a game-controlled area. The success of this particular program is evidence of the government's determination to strengthen wildlife protection in Kenya (see Map 2.3).

Movement, in Jones' field theory model, may be created, changed, or restricted as a result of politically motivated decisions. The decisions having political implications produce so-called "circulation fields." The case of wildlife conservation in Kenya produces a number of examples. One clear instance relates to the policing of the conservation areas. Except in District Council Game Reserves, where local supervision is common, the officers of the Kenya Game Department

²⁶Government of Kenya, Game Department Annual Report 1962 (Nairobi: The Government Printer, n.d.), p. 3.



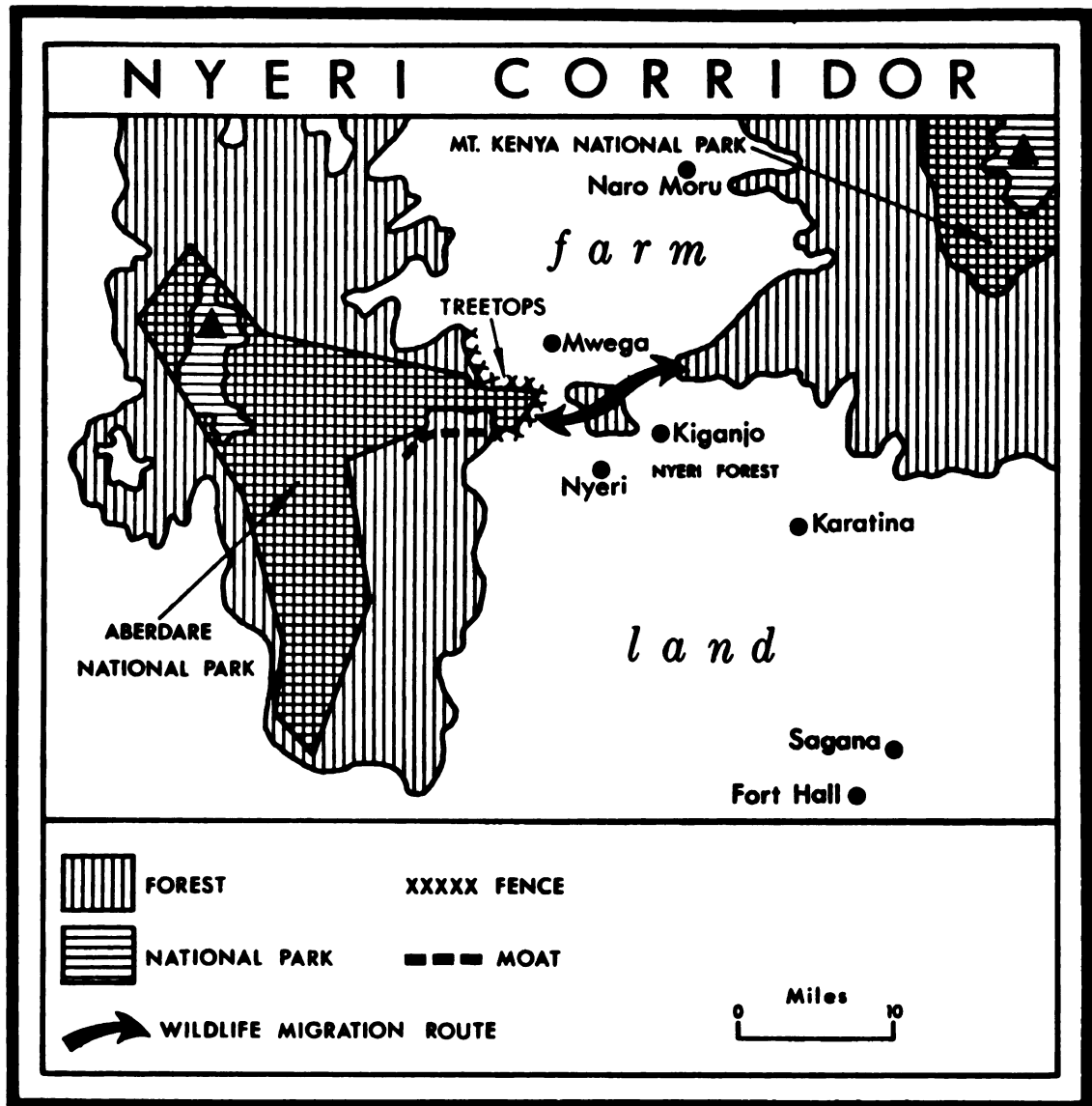
Figure 2.4 Evidence of Masai encroachment upon Amboseli's maximum game protection area: a boma adjacent to the swamp, which can be seen in the background.

are frequently drawn from distant areas of the country, so that a Kikuyu officer may be in charge of patrolling a wildlife sanctuary in Kamba country. It has been deliberate policy to recruit rangers for the large anti-poaching Field Force from among the peoples of Northern Kenya: the Rendille, Turkana, Samburu, and Orma. Movement of this kind is somewhat analogous to the British use of Ganda administrators in the non-Ganda sections of Uganda.²⁷ In a broader sense, the distribution of Kenya's wildlife conservation areas (see Map 2.3) has produced fields of administrative contact between the central government and peoples who otherwise might have little direct involvement with Nairobi. The location of the game sanctuaries has also had an impact on the development of Kenya's road system; certain parts of the country which might not otherwise be considered for road construction or improvement were on the priority list of the 1966-1970 Development Plan.²⁸ One such road connects Masai-Amboseli to Tsavo National Park and the Voi-Taveta Road, another is between Voi and Malindi along the Sabaki River, and a third improvement will link the newly gazetted Meru National Park to the network of the core area.

In the area of restrictive movement, park and reserve boundaries may well interfere with the nomadic migrations of men and animals in search of water and forage. One special case of such interference involves the Aberdare National Park, where animal herds, particularly elephants, have long migrated back and forth across

²⁷ H. J. de Blij, op. cit., p. 272.

²⁸ Republic of Kenya, Development Plan 1966-1970 (Nairobi: The Government Printer, 1966), pp. 214-15. See also Chapter 9.



Map 2.4

Nyeri Corridor

Source: F. W. Woodley, "Game Defence Barriers," East African Wildlife Journal, Vol. III, 1965, p. 89.

farmland between the Aberdare and Mt. Kenya forests²⁹ (see Map 2.4). In order to protect the farms from raiding by migrating wild animals and to protect the animals, both from retaliation by farmers and from control shooting by the Game Department, fences and moats have been constructed to close off this migration route completely.³⁰

Decisions emanating from the conservation idea have produced other forms of field-creating movement, all with direct or indirect political implications. Some of these involve the tourist industry itself. The overwhelming majority of Kenya's hotels and other tourist-oriented establishments are still owned by non-Africans and it has been argued, by opponents of government policy, that dependence on the tourist trade leads to status-quo politics. The economic impact of the tourist industry is evident in the rapid development of central Nairobi, where luxurious hotels and the many travel and safari offices dramatically reflect the importance of the growing stream of foreign visitors. Outside Nairobi, too, tourism's impact, though less obvious, is felt almost everywhere in the country. Kenya's National Parks alone annually draw a quarter of a million visitors and an increasing number of tourists are enjoying the attractions of the country's coastal resorts. Overseas tourists, with their money and demand for luxury, are bringing changes to distant corners of Kenya, as evidenced

²⁹ Meinertzhagen reports witnessing this migration in 1903. He records observing a herd of 700 elephants following the return migration route from Mt. Kenya through the Nyeri Forest to the Aberdare Mountains (Meinertzhagen, op. cit., p. 107).

³⁰ F. W. Woodley, "Game Defence Barriers," East African Wildlife Journal, Vol. III (1965), pp. 89-94

by the German-speaking African labor force of Malindi's beachfront hotels.

Field and Political Area

Wildlife conservation in a colonial dependency, an apparently apolitical idea, has led in Kenya to a fragmented national territory whose game conservation areas have come to constitute and represent much more than that. In this chapter the conservation idea has been used in the context of Jones' unified field theory to provide a conceptual perspective for the historico-geographical data that have relevance to this field, and to give emphasis to the "hubs" of activity that have marked the idea-area chain in this context. The conservation areas in Kenya constitute a large part of the national territory, and their creation and maintenance have involved the activities of a substantial number of people. As Jones wrote in response to a draft of this Chapter, "your work . . . shows that [my own contribution] does have relationship to reality."³¹

³¹ S. B. Jones, Personal Communication, December 4, 1969.

CHAPTER III

WILDLIFE CONSERVATION IN KENYA TODAY:

ESSENTIALS OF THE SYSTEM AND

SALIENT PROBLEMS

The optimal use and conservation of wildlife resources, in Africa as well as in other parts of the world, relates directly to planning, organization, and control. Where the exploitation of such resources has gone on unchecked or with inadequate control, their expendability was soon reflected by growing lists of extinct species. Few countries possess faunal resources as productive and promising as Kenya and few countries would require as well-functioning a system of wildlife conservation as does this richly endowed republic.

Administration

The system of wildlife conservation in Kenya, as it is presently constituted, consists of two basic fields of activity. One is the creation, maintenance, and operation of the several types of sanctuaries which afford varying degrees of protection to wildlife. The other involves the regulation of hunting along with other forms of exploitation of wild animals, and includes the resolution of direct conflicts between human and wildlife interests through such activities as control shooting and vermin control. The administration of the wildlife conservation system in Kenya today is under the overall direction of a separate government ministry, the Ministry of Tourism and Wildlife, but the direct supervision of the various elements of the system is carried out by a number of agencies, both

within the Ministry and outside of it. The Kenya Game Department, local District Councils, and the quasi-independent National Parks Board of Trustees all administer wildlife sanctuaries of different types, and the Forest Department controls additional reserve areas of faunal interest. Hunting regulation and game control work in defense of human life and property are primarily the responsibilities of the Game Department. Vermin¹ control is considered to be the responsibility of local authorities, but the Game Department does assist in this area when their resources permit.

Hunting Regulation

Licenses and Fees

The regulation of hunting was the first conservation measure adopted in Kenya and it remains an important part of the wildlife conservation system today. All hunters, both resident and non-resident, are required by law to hold a valid hunting license. There are several types of licenses which vary in duration and in the number and variety of animals that can be killed. Table 3.1 lists the types of licenses available in Kenya and the fees for each. Class A licenses are for non-residents and the fees for them are in each case ten times the fees for Class B, or resident licenses. All licenses except the fourteen-day license are valid for one year. The species and number of animals that can be shot on each license

¹In Kenya wild animals are classified as vermin if they cause damage and are not scheduled as game animals in the Wild Animals Protection Ordinance. Among the animals so classified are hyena, jackals, baboon, and several species of monkeys. See Colony and Protectorate of Kenya, Report of the 1956 Game Policy Committee, Sessional Paper No. 7 of 1957/58 (Nairobi: The Government Printer, 1958), p. 18.

are listed in the Wild Animals Protection Ordinance, Third Schedule Part II (see Appendix III).

Table 3.1
HUNTING LICENSES AND FEES

	<u>Sh.</u>	<u>cts.</u>
1. A full licence		
(1) Class A	1,000	00
(2) Class B	100	00
2. A fourteen-day licence		
(1) Class A	500	00
(2) Class B	50	00
3. A private land licence		
(1) Class A	750	00
(2) Class B	75	00
4. An employee's licence	100	00
5. A bird licence	60	00

Source: Republic of Kenya, Legal Notice 94, The Wild Animals Protection Act (Amendment of Schedules) Order 1967.

The holder of a full license is entitled to shoot 16 different species; he is allowed two of most of these species but is restricted to one each in the case of four species and is allowed to kill three common zebra. On a fourteen-day license the hunter is restricted to 11 species and is allowed to shoot just one of each. On both licenses an unlimited number of game birds are allowed. The private land license permits a hunter, with the consent of the landowner, to kill, on private land, unlimited numbers of any animal listed in Part II of the Third Schedule (i.e., the same 16 species allowed on a full license). An employee's license is identical to a private land

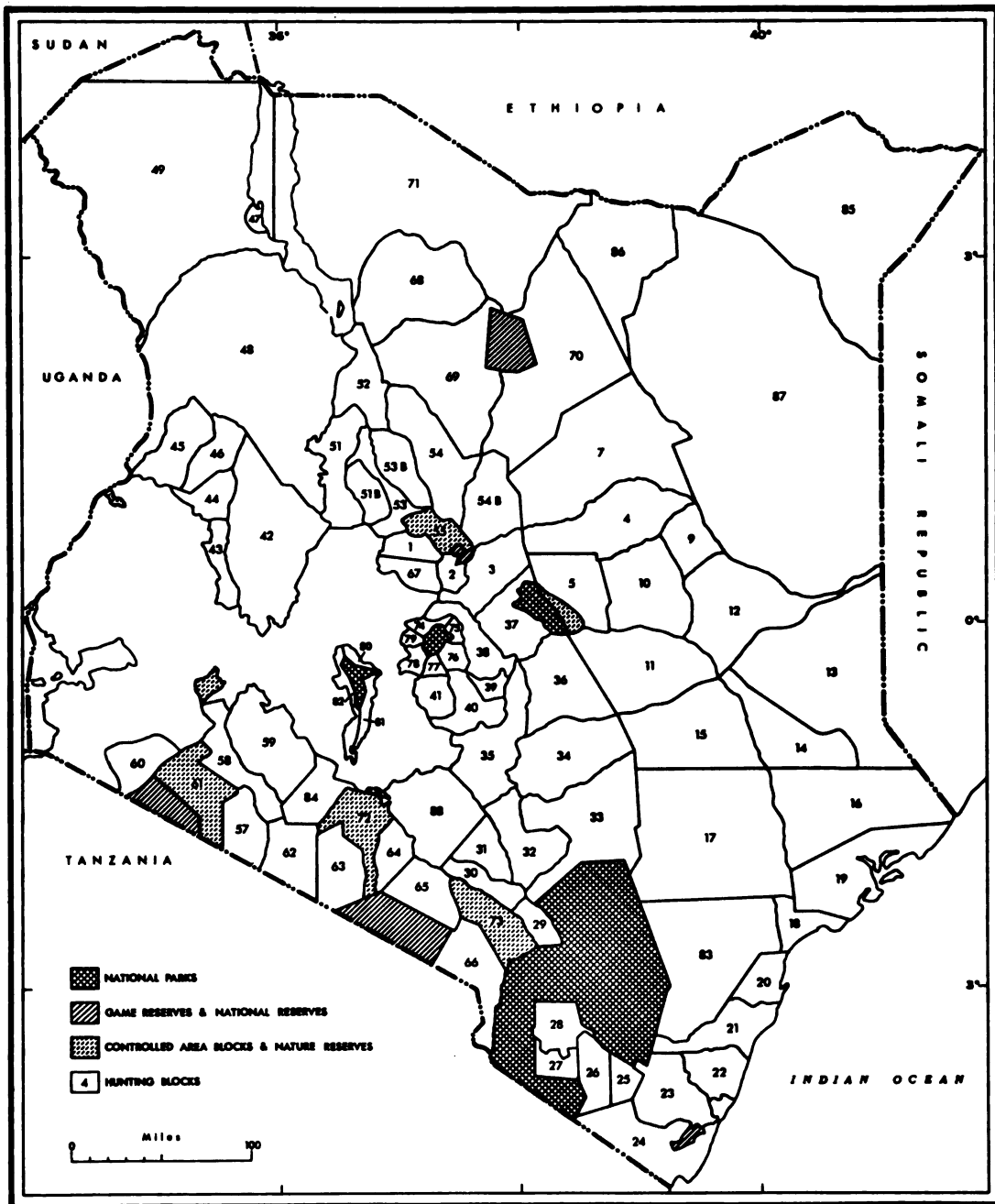
license except that it is restricted to African or Somali employees of a landowner.² A bird license entitles the hunter to shoot an unlimited number of game birds.

Special Licenses. In addition to the animals which are allowed on the license, the holder of a full license may apply for special licenses to hunt 29 other species. These animals, which may be hunted only under special license, include most of the popular game species and all of the dangerous game animals, such as elephant, lion, leopard, rhinoceros, and buffalo. A separate special license is required for each animal and is restricted to one such license for each species except in the case of buffalo where three are allowed, and elephant where two licenses are permitted. The fees for special licenses range from sh.30/ for duiker to sh.2,000/ for rhinoceros and sh.2,500/ for the second elephant license.³ The special license system has been expanded gradually over the past 15 years. In 1957 special licenses were required for only nine species; this was expanded to 14 in 1958 and to the present 29 in 1964.⁴ With a full license and all the special licenses, hunters in Kenya today may shoot a total of 45 game animal species. The remaining game animals in Kenya are fully protected from hunting.

²Laws of Kenya, The Wild Animals Protection Ordinance, Chapter 376, Section 12.

³See Appendix III for animals that may be hunted on special license and the fees for each license.

⁴See Appendix I for a comparison of special licenses issued from 1956 to 1965.



Map 3.1

Wildlife Conservation Areas

Source: Survey of Kenya, Kenya Hunting Map, Series SK57B, Edition 1, 1965.

Protected Game

Full protection from hunting has been given to a wide variety of animals in Kenya. The protected list includes all immature game animals, pregnant females and females with young, all female lion and giraffe, and all individuals of a large number of species. Completely protected animals include the roan and sable antelopes, Uganda kob, hippopotamus, and elephants with tusks weighing less than 25 pounds in total. Among the predators protected are the cheetah, wild dog, caracal, golden cat, and serval cat. Other animals on the list include hyrax, otters, aardwolf, several species of monkeys, and all birds other than game birds, queleas, and mouse birds.⁵

Controlled Areas

Hunting is further regulated through the Controlled Area system which covers most of the country's game areas outside of the National Parks and Game Reserves. Virtually all land in Kenya having substantial game interest is included in the system except for private land and that already designated as park or reserve land. The Controlled Areas (see Map 3.1) that make up the system are all under the control of the Game Department in regard to hunting. A Controlled Area permit is required to hunt in any Controlled Area and these are issued at the complete discretion of the Chief Game Warden. He may attach any conditions he sees fit to such permits including restrictions on particular species or number of animals

⁵ See Appendix VII for a complete list of protected animals.

TABLE 3.2
CONTROLLED AREA FEES PAID TO DISTRICT COUNCILS 1958-1965

District	1965 Sh.	1964 Sh.	1963 Sh.	1962 Sh.	1961 Sh.	1960 Sh.	1959 Sh.	1958 Sh.
Kwale	11,350	3,811	4,000	3,320	2,130	2,368	1,540	580
Kajiado	133,085	80,773	38,330	26,060	22,180	19,690	20,370	13,655
Narok	86,105	54,915	28,030	26,940	26,815	20,190	19,680	22,765
Kilifi	4,412	1,850	6,539	8,387	2,095	1,871	1,895	2,315
Isiolo	9,645	5,785	9,305	11,715	7,500	5,910	8,227	5,465
Garissa	60	445	10,380	11,293	9,420	5,475	105	4,390
Tana River	11,865	7,030	6,339	5,840	4,425	4,050	-----	-----
Baringo	1,537	1,360	470	335	305	-----	490	90
West Suk	1,070	1,760	230	285	235	645	390	175
Machakos	50,910	39,930	18,275	13,345	12,995	9,265	6,960	7,140
Taita	36,070	16,350	12,140	11,000	8,115	5,173	3,180	3,315
Meru	1,255	1,240	455	265	600	1,690	1,365	595
Embu	5,195	2,710	1,265	1,310	2,140	2,260	280	340
Kitui	27,935	30,415	6,780	8,055	4,455	2,383	2,610	2,475
Lamu	320	310	3,850	825	1,035	1,175	1,055	280
Wajir	-----	35	145	235	-----	-----	-----	-----
Elgeyo Marakwet	1,000	250	600	230	170	290	255	160
Nanyuki	9,120	3,250	3,525	900	2,155	1,240	460	615
Samburu (Maralal)	24,755	10,665	8,350	4,675	5,450	5,915	2,135	1,275
Marsabit	860	790	1,465	-----	440	400	740	50
Lodwar Turkana	1,900	1,640	730	520	70	315	275	40
Galana River	5,470	2,350	-----	-----	2,315	-----	-----	-----
Forest Areas	9,945	10,620	5,955	2,515	2,035	1,935	2,575	500
Lake Naivasha	6,584	9,480	-----	-----	-----	-----	-----	-----
Moyale	-----	-----	30	305	-----	-----	-----	-----
Mandeira	-----	-----	65	20	-----	-----	-----	-----
TOTAL SH.	440,448	287,764	167,253	138,425	117,080	88,980	74,587	66,220

Source: Kenya Game Department, Annual Reports, 1958-1965

allowed, and may even close an Area completely to all hunting.⁶ The Department attempts to spread hunting pressure and prevent overcrowding by limiting the number of parties hunting in any Hunting Block⁷ at the same time. In practice this means that it is necessary for hunters to make advance reservations for use of Controlled Areas, particularly in the case of the more popular Hunting Blocks. The Controlled Area system thus assures the hunter that when he receives a permit for a Block he will not find it overcrowded with other hunters. The system also provides the Game Department with a very flexible tool for game management, allowing an unlimited range of options regarding hunting restrictions, which may be tailored to meet the specific management needs of local areas.

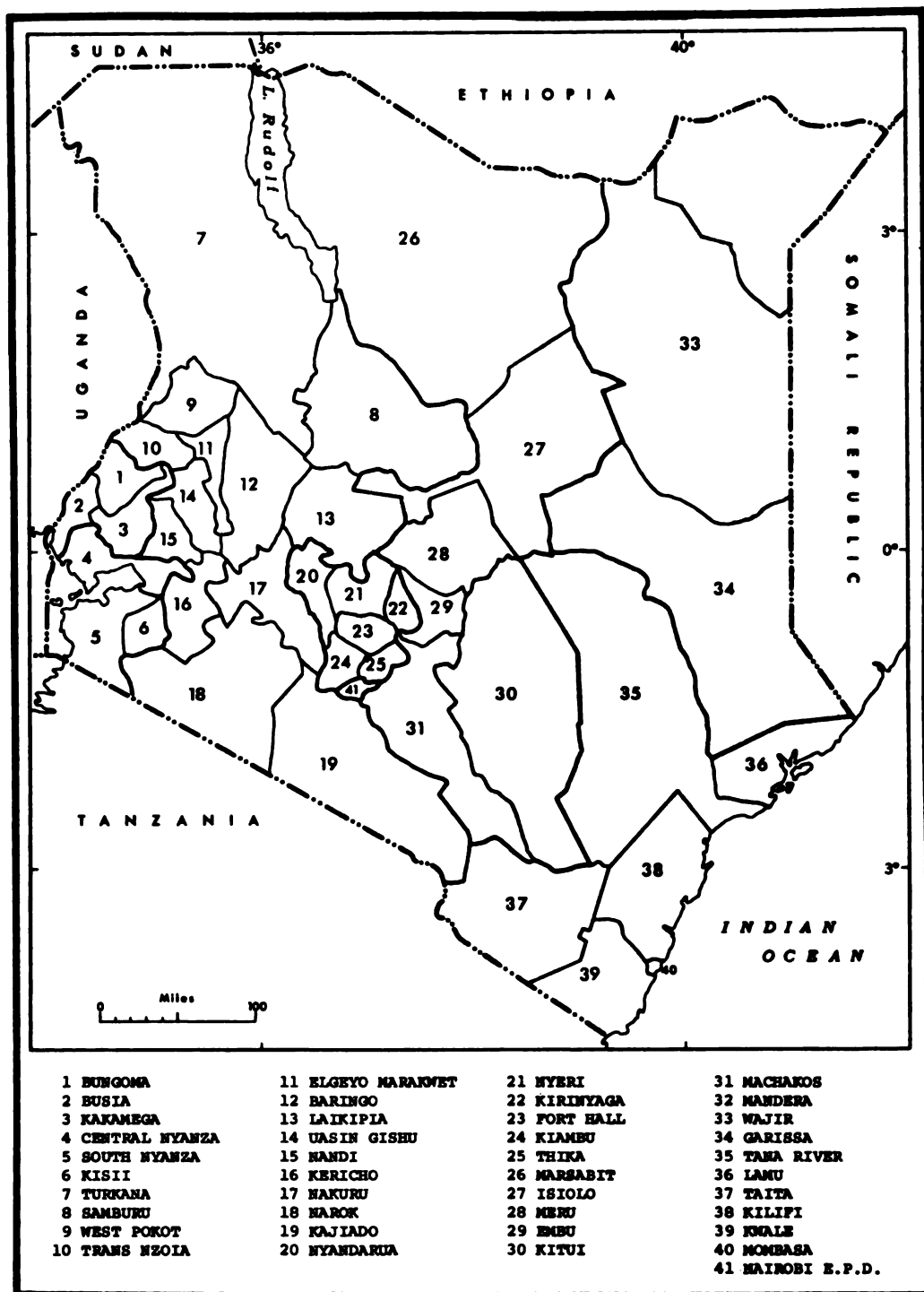
Benefits to Local People. The Controlled Area system also serves to bring some of the economic benefits of wildlife exploitation directly to the people in the form of fees collected from the hunter for use of a Controlled Area and paid directly to local District Councils. A separate fee is assessed for each animal shot, and the fee schedule resembles that for special licenses. The Controlled Area fee schedule, however, includes fees for animals that do not require special licenses, such as impala, gazelle, and zebra.⁸ Table 3.2 shows the Controlled Area fees received by

⁶ Colony and Protectorate of Kenya, Report of the 1956 Game Policy Committee, Sessional Paper No. 7 of 1957/58, pp. 13-14.

⁷ A Game Policy for Kenya, Sessional Paper No. 1 of 1959/60, pp. 1 and 3.

⁸ A Hunting Block is a Controlled Area that is open to hunting.

⁸ See Appendices IV and V for a complete list of Controlled Area fees.



Map 3.2

Kenya: Districts

District Councils from 1958 to 1965. The steady increase in total receipts reflects both an increase in hunting⁹ and upward revisions of the fee scale during that period. Districts with substantial game interests like Kajiado, Narok, Machakos, and Taita realize significant income from Controlled Area fees.¹⁰ These payments, it is felt, help to compensate local people for the inconveniences and possible economic and personal losses that might accrue from the maintenance of wild animals on their land. District Councils are encouraged to use at least part of the money received from Controlled Area fees to reimburse people for damage or personal injuries caused by wild animals. The Game Department has strongly urged that such compensation schemes be more widely implemented and has suggested that this would help in obtaining local support for wildlife conservation measures.¹¹

Growth and Development of Hunting

Licensed hunting, in Kenya, has increased steadily in recent years. In 1965, 307 full licenses were issued to visitors and 636 to residents. Ten years earlier, in 1956, only 63 visitors and 449 residents hunted in Kenya on full licenses.¹² Continued growth in

⁹See Table 3.3 for animals shot on license in Controlled Areas 1959-1965.

¹⁰Kenya's Districts are shown on Map 3.2.

¹¹Republic of Kenya, Game Department Annual Reports 1964 and 1956 (Nairobi: The Government Printer, 1967), p. 15.

¹²See Appendix I for a complete annual breakdown of all hunting licenses, including special licenses, issued in Kenya during the period 1956-1965.

TABLE 3.3

GAME ANIMALS SHOT ON LICENCE IN CONTROLLED AREAS (1959-1965)

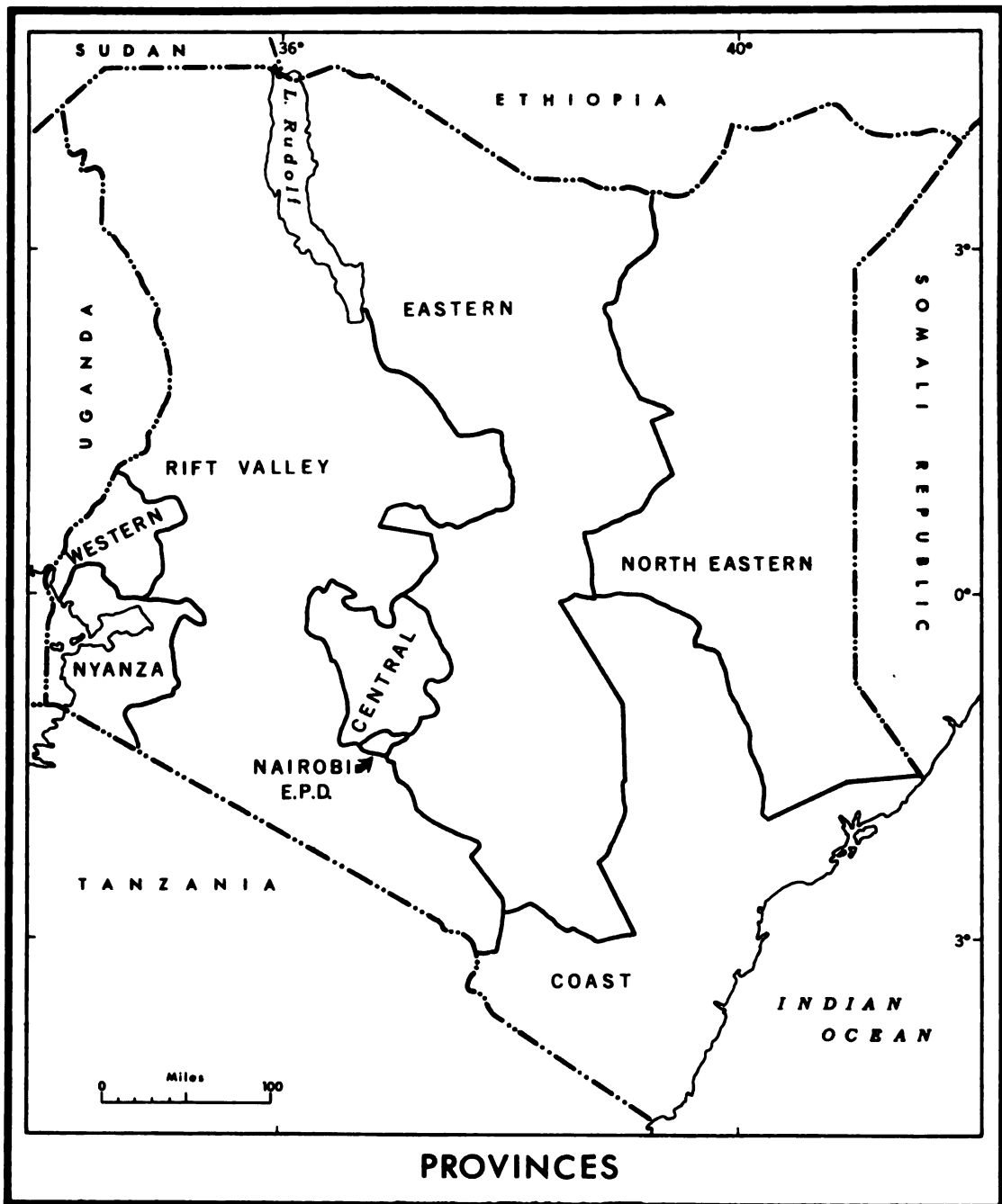
Species	1965	1964	1963	1962	1961	1960	1959
Bushbuck	69	55	76	53	70	76	86
Bongo	8	9	2	4	5	2	10
Buffalo	236	195	207	157	207	180	200
Crocodile	34	40	47	52	---	37	46
Duiker Blue	4	13	29	8	15	36	23
Duiker Red	1	1	---	---	---	---	---
Duiker Black	4	---	---	---	---	---	---
Duiker Grey	18	10	---	---	---	---	---
Dikdik	181	190	138	164	119	121	229
Eland	120	80	96	75	68	65	85
Elephant	198	137	177	162	189	180	151
Gerenuk	128	132	145	150	121	110	150
Giraffe	3	1	---	---	---	2	2
Forest Hog	14	15	29	4	10	8	5
Gazelle Grant	540	355	352	328	247	282	296
Gazelle Thomson's	380	315	311	309	208	229	239
Hartebeeste Cokes	320	140	187	155	138	238	182
Hunter's Antelope	---	---	8	11	10	12	18
Impala	623	468	460	451	381	326	309
Klipspringer	21	26	18	24	12	17	15
Kudu Lesser	100	74	83	96	93	69	70
Kudu Greater	8	14	4	1	---	14	16
Leopard	140	102	104	92	81	72	84
Lion Masai	60	39	35	41	14	27	6
Lion Other	9	14	24	15	67	18	11
Monkey Blue	1	10	1	1	---	---	---
Monkey P/Nosed	---	---	---	---	---	---	---
Monkey Patas	---	---	---	---	---	---	---
Monkey Colobus	2	1	---	---	---	---	---
Oribi	53	35	---	---	17	26	39
Oryx Fringed Eared	134	35	---	---	---	---	---
Oryx Beisa	38	133	189	185	163	159	165
Ostrich	28	40	42	38	48	26	27
Reedbuck Bohor	18	5	---	---	---	---	---
Reedbuck Chanlers	11	15	10	6	25	34	34
Rhinoceros	27	30	48	51	86	100	88
Suni	2	5	5	---	---	---	---
Steinbok	42	43	31	17	25	27	26
Waterbuck Common	75	92	95	78	123	138	46
Waterbuck Defassa	73						
Wildebeeste	190	118	144	125	76	104	83
Wart Hog	190	129	100	96	113	118	128
Zebra common	821	737	450	530	400	598	314
Zebra Grevys	53	29	55	77	64	50	69
Topi	40	36	85	65	53	47	24

Source: Kenya Game Department Annual Reports 1959-1965

the number of people hunting in Kenya can be anticipated, although the Game Department is already experiencing difficulty in accommodating the demand for hunting facilities in the Controlled Areas and has been forced to double-book some of the larger of the more popular Blocks.¹³ Extensive doubling-up of hunting parties produces less attractive conditions for the hunters but results in more efficient utilization of the wildlife resource. The increased hunting pressure in the Controlled Areas is certainly well within the limits of annual productivity of game populations in most areas and the Department's ability to restrict shooting or close blocks completely to hunting should assure that overhunting does not become a serious problem.

Other outlets for the increasing number of hunting parties are the northern Controlled Areas and private land. Hunting Blocks in the northern and northeastern sections of Kenya have recently been reopened after being closed for several years because of security problems. These Blocks contain some game animals not found in other parts of the country and, although game densities are lower than in the south, they should prove attractive to many hunters and help to take some of the pressure off the more popular Hunting Blocks in southern Kenya. Hunting on private land has, in the past, been confined largely to residents, but an increasing number of visitors are beginning to utilize these areas as well. As demand for hunting accommodations increases in the future, privately owned land could provide a substantially larger proportion of the total hunting land than it does today.

¹³Game Department Annual Reports 1964 and 1965, p. 28.



Map 3.3

Kenya: Provinces

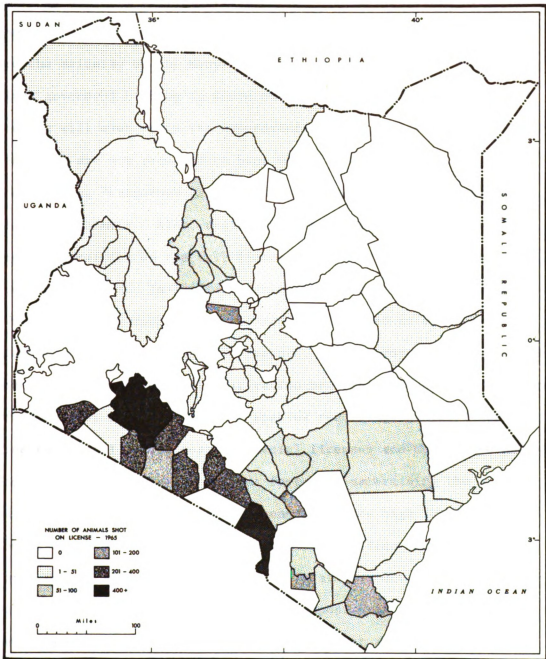
Utilization of Hunting Blocks

The concentration of hunting pressure in southern Kenya is well illustrated in Map 3.4 which shows the number of animals shot on license in Controlled Areas in 1965.¹⁴ Block 66, between Tsavo National Park and Amboseli, was the most heavily utilized Controlled Area, a total of 671 animals being shot on license. Blocks 58 and 59 in Narok District were also very popular and over 400 animals were shot in each of these blocks. Other heavily utilized Hunting Blocks were 57 and 60 in Narok and 63, 64, 65, and 84 in Kajiado District. In fact, all of the nine most popular Hunting Blocks are in the two districts which make up Kenya Masailand. The popularity of these areas with hunters, together with the important wildlife concentrations of the Mara and Amboseli Reserves, highlights the crucial position of the Masai areas in Kenya's wildlife conservation system.

Economic Benefits of Hunting to the National Economy

Although overshadowed by the enormous income from other forms of tourism, the economic value of the hunting industry to Kenya should not be overlooked. Clarke and Mitchell have estimated that the total expenditure of visitors hunting in Kenya in 1966 was nearly £1 million. Per person expenditures were high, averaging over £1,600, as all visitors are required to hunt with a professional hunter and must therefore undertake a relatively elaborate safari. Total expenditures of resident hunters, although they were almost

¹⁴Appendix VII contains precise data on animals shot by species in each of the Hunting Blocks during 1965.



Map 3.4

Utilization of Hunting Blocks, 1965

Sources: Base after Survey of Kenya, Kenya Hunting Map, Series SK57B, Edition 1, 1965. Hunting kill data from Kenya Game Department Annual Report, 1965.

twice as numerous as visitors, was estimated at just over £100 thousand.¹⁵ In terms of economic benefit, then, overseas visitors are the mainstay of the Kenya hunting industry. Indeed, the regulations governing hunting in Kenya make it unlikely that the resident hunting will ever reach the expenditure level of visitors. Residents are not required to hunt with professional hunters except when hunting "dangerous game," and so are spared the expenses of elaborate safaris. Also, resident hunters concentrate more on the species permitted on the full license and do not purchase many special licenses. In 1965, for example, residents were issued only two licenses for rhinoceros compared to 47 issued to visitors; for lion the ratio was 34:143, for leopard, 45:224, for elephant, 64:183, and for eland, 66:204. Similar ratios between residents and visitors prevailed for most of the other species requiring special licenses (see Appendix I). The cost of special licenses and Controlled Area fees is undoubtedly a significant factor in determining the hunting pattern of residents. Special license fees are high for the more sought-after animals and when Controlled Area fees are added on the total cost of shooting these animals is simply more than the average resident hunter can afford. It would appear that residents are being priced out of much of the hunting market and that one of the effects of the fee structure is to allocate a large part of Kenya's huntable game animals to overseas hunters. Such allocation is, of course, economically sound and serves to maximize the benefit to the Kenya economy from hunting.

¹⁵R. Clarke and F. Mitchell, "The Economic Value of Hunting and Outfitting in East Africa," East African Agricultural and Forestry Journal, Special Issue, June, 1968, pp. 89-97.

Wildlife Sanctuaries

Notwithstanding the richly varied fauna and flora of Kenya, effective conservation practices did not emerge until after the Second World War. Efforts in this direction had been piecemeal since the creation of the first wildlife sanctuaries in the early years of the twentieth century (see Chapter II) but not until the mid-1940's did a practical, integrated proposal for large-scale wildlife protection make its appearance.

The core of Kenya's wildlife conservation system today lies in those areas of the country that have been set aside as wildlife sanctuaries. The different types of wildlife conservation areas that make up the present system exhibit a hierarchy of levels of protection similar to that suggested at the London Convention of 1933 (see Chapter II). Although a direct outgrowth of ideas on conservation organization developed at the 1933 Convention, Kenya's modern wildlife conservation areas were not fully implemented until 1948.

The 1939 Game Policy Committee

The first movement toward a reorganization of wildlife conservation in Kenya, following the 1933 London Convention, was the convening in 1939 of a Game Policy Committee charged to make recommendations to the government concerning the establishment of National Parks and other types of wildlife sanctuaries in the colony. Their deliberations interrupted by the war, the Committee was able to submit only a brief interim report in 1942 recommending that legislation be enacted to institute National Parks in Kenya and

suggesting an area near Nairobi and the Tsavo area in southeastern Kenya as desirable Park sites. After the war, in 1946, the Second Interim Report of the Game Policy Committee¹⁶ was published and the reorganization of Kenya's wildlife conservation system was begun.

The Committee recommended the establishment of four National Parks, including parks in the Nairobi and Tsavo areas as they had earlier suggested, and additional parks on the Aberdare Mountains and Mt. Kenya. Nairobi National Park was the first to be gazetted, followed shortly thereafter by Tsavo National Park, established in 1948. Mt. Kenya National Park, comprising all land on the mountain above the 11,000-foot contour, was established in 1949, and the Aberdare National Park was created in 1950.

Park Adjuncts. The Game Policy Committee also recommended that "Park Adjuncts" be created in areas where circumstances made the establishment of National Parks impossible. National Parks were to be administered by an independent public body, the Trustees, who would have complete powers in regard to the management and use of park land. The Committee found that there were many areas of Kenya of outstanding biological and scenic interest that should be protected but where permanent human rights precluded the exercise of the kind of authority inherent in National Parks administration. They suggested, therefore, the institution of "Park Adjuncts," in which the National Parks Board of Trustees would have the care of, and responsibility for, the flora and fauna, but would not have the

¹⁶Colony and Protectorate of Kenya, Second Interim Report of the Game Policy Committee (Nairobi: The Government Printer, 1946).

absolute powers conferred upon them in National Parks. What powers and rights the Trustees were granted were to be exercised with care so as to avoid undue inconvenience to human rights or interference with human development and expansion.¹⁷ The Game Policy Committee was aware of the difficulties involved in such an arrangement, and pointed out that the ". . . powers and rights held by the Trustees in Park Adjuncts will be on sufferance, and as a result of the goodwill of those who grant, and are affected by, the Park Adjuncts."¹⁸ These words were prophetic, as the Trustees were soon to find out, and the "Park Adjunct" principle was to be abandoned after a brief, unsatisfactory period.

National Reserves. The "Park Adjuncts" that were created as a result of the Committee's recommendations were called National Reserves. Among the areas so designated were Amboseli, Mara, and Marsabit. The Amboseli National Reserve covered over 1,200 square miles at the foot of Mt. Kilimanjaro, one of Kenya's most scenic game-viewing areas. The Mara National Reserve included about 700 square miles of grassland and savanna country in southwestern Kenya that supported a spectacular array of plains wildlife. The Marsabit National Reserve was created out of the existing Northern Game Reserve which covered 10,000 square miles of northern Kenya. Smaller National Reserves were established in the Ngong Hills near Nairobi, in the Western Chyulu area, and along the road and railroad right-of-way through Tsavo National Park.

¹⁷ Ibid., pp. 16-22.

¹⁸ Ibid., p. 17.

Conflict and the 1956 Game Policy Committee

The National Reserve idea proved troublesome from the start and it soon became evident that conflicts between human interests and wildlife conservation management needs were inevitable. The National Parks Board of Trustees found that it could not develop the kind of management programs it felt were necessary in these areas without some interference with human interests and that, in fact, good wildlife management was impossible in the face of strong opposition by local people. Such conflicts were particularly severe in the Amboseli National Reserve where competition between wildlife and Masai cattle and access to the permanent water in the vicinity of Ol Tukai swamp became bitterly contested issues. The Trustees' difficulties in administering the National Reserves led the Kenya Government to appoint a new Game Policy Committee to recommend future wildlife conservation policy. The Committee's first two terms of reference give ample evidence of the problems that produced the need for a reappraisal of Kenya's wildlife conservation system. They were:

- (1) to consider and make recommendations as to the policy to be adopted for the long-term preservation of game, having regard to the interests of human population in game areas and to the economic development of the country;
- (2) in view of the urgency of a solution of the conflict in the Amboseli National Reserve between game and human interests which is rapidly reducing the value of this area as a game reserve, to make interim recommendations for the preservation of the game interest, having due regard to the considerations in (1) above;¹⁹

¹⁹ Report of the 1956 Game Policy Committee, p. 1.

The recommendations of the 1956 Game Policy Committee were to become the basis for the present system of wildlife conservation areas in Kenya.

The Committee's report reaffirmed the primary role of the National Parks as the main instrument of long-term game preservation policy, and pledged that the Government would maintain existing National Parks and endeavor to create new parks in areas of great faunal interest providing that such areas contained no conflicting human interests. The Report also recommended the abolition of the National Reserves, substituting for them Game Reserves to be administered by the Game Department together with a Game Advisory Committee made up of local people. This would relieve the Trustees of the National Parks of the onerous burden of administering wildlife areas over which they had little real control. The Committee also urged the extension and full implementation of the Controlled Area system as an instrument of management and control of wildlife.²⁰

District Council Game Reserves. Following the publication of the Report the National Reserves were gradually dissolved and replaced by Game Reserves, except for Marsabit which was reduced to 800 square miles but remained a National Reserve pending negotiations to establish a National Park in the area of Marsabit Mountain. In an attempt to involve local people in the wildlife conservation effort, local authorities were encouraged to assume responsibility for areas of high faunal interest through the creation of African District Council Game Reserves. In these new Reserves wildlife

²⁰Ibid., pp. 1-3.

would be managed by the Game Department and all other regulations pertaining to human activities within the Reserve would be under the control of the Council. The district Council would, in return, benefit through receipt of all fees paid by visitors to the Reserve.

The Meru District Council was the first to take action, in 1960, creating a 600 square mile Game Reserve northeast of Mt. Kenya and passing by-laws controlling entry, cultivation, grazing, and the destruction of vegetation.²¹ In the same year both the Narok and Kajiado District Councils agreed to create Game Reserves in the Mara and Amboseli areas respectively, and to pass by-laws regulating human activities within the Reserves.²² The Masai Mara Game Reserve, officially established in 1961, consisted of a 200 square mile inner area, in which all livestock was excluded and all human activities controlled, and a 500 square mile outer area in which cattle were allowed to graze but vegetation destruction by burning was prohibited.²³ The Masai Amboseli Game Reserve was also opened in 1961, when the District Council assumed control of the over 1,200 square mile area. The future of the Reserve looked secure when the Council, which had passed by-laws regulating burning and other human activities in other parts of the district, notably the Kitengela area south of Nairobi Park, agreed to consider the creation of an inner

²¹ Colony and Protectorate of Kenya, Game Department Annual Report, 1960 (Nairobi: The Government Printer, 1961), p. 2.

²² Ibid., p. 3.

²³ Colony and Protectorate of Kenya, Game Department Annual Report, 1961 (Nairobi: The Government Printer, n.d.), p. 3.

sanctuary which would exclude all domestic livestock from a 200 square mile area around the swamp.²⁴ In 1962 the Samburu Game Reserve was created out of a small (22 square mile) piece of the old Marsabit National Reserve.²⁵ The Samburu Reserve was later enlarged to 40 square miles and the total area of Reserve land was increased to 115 square miles with the creation of the adjoining Buffalo-Springs Game Reserve.²⁶

With the establishment of these five District Council Game Reserves and Lake Nakuru National Park, in the early 1960's, Kenya's wildlife conservation system assumed approximately its present form. There have been some small additions to the system in recent years, notably the Shimba Hills and Mt. Elgon National Park, and a change of status at Meru, where the old Game Reserve became a National Park in 1968, but the essential sanctuary areas that comprise the present system were all in existence within a few years after the publication of the Report of the 1956 Game Policy Committee.

Salient Problems

Kenya's wildlife conservation areas today are generally successful in fulfilling their preservation objectives and have become an important economic asset to the country. An increasing stream of foreign visitors, attracted to Kenya primarily by the

²⁴Ibid., pp. 4-5.

²⁵Government of Kenya, Game Department Annual Report, 1962 (Nairobi: The Government Printer, 1963), pp. 3 and 6.

²⁶J. G. Williams, A Field Guide to the National Parks of East Africa (London: Collins, 1967), pp. 69-71.

region's wildlife, has already made tourism one of the nation's largest industries and it is today the fastest-growing sector of the Kenya economy.²⁷ The importance of the wildlife areas to the growth of Kenya tourism is evidenced by the steady increase in visitors to the National Parks. From about 75,000 in 1960 the number of visitors to the nation's Parks had climbed to nearly 250,000 by 1967 (see Appendix VIII). The economic significance of wildlife-based tourism has prompted the Kenya Government to support, both directly and indirectly, the development of expanded tourist amenities in the game sanctuaries and to encourage management plans and land use restrictions designed to ensure the preservation of these valuable areas and their wildlife resources. This is not to suggest that there are not still serious problems facing the wildlife conservation system in Kenya. Although some of the old problems and conflicts have been resolved, others have continued to be a source of concern and still others have only recently arisen.

Management Problems and Conflicts

The problems facing wildlife conservation in Kenya today may be conveniently divided into two categories. One set of problems are distinctly of a management nature, including those involving ecological requirements of game populations and the necessity to manipulate the environment in order to achieve as nearly "natural" conditions as are possible within the unnatural confines of game sanctuaries, and those produced by the environmental impact of the

²⁷ Above, Chapter II.

J. P. B. M. Ouma, op. cit., Preface and p. 31.

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increasing number of visitors who are utilizing the wildlife-viewing areas. The second category of problems involves conflicts between human and wildlife interests, particularly in areas within or adjacent to game sanctuaries. These include illegal hunting, as well as the impact of agricultural land use, in both its pastoral and arable forms.

The Tsavo Elephant Problem. Management problems involving primarily ecological considerations are well illustrated by the long-standing controversy surrounding the Tsavo elephant population. The Tsavo National Park (8,050 square miles) and surrounding area, a total ecological unit of about 17,000 square miles contains the largest concentration of elephants in Africa. The elephant population of this area was recently estimated to be 30-40,000.²⁸ The Tsavo region has been subjected to large-scale destruction of woody vegetation by this rapidly expanding elephant population since the early 1960's and concern was being expressed regarding the possible overpopulation of elephants in the area as early as 1963.²⁹ It was widely believed by scientists and laymen in Kenya at that time that control of the elephant population would be necessary.³⁰ Even so

²⁸ R. W. Laws, reported in J. Goddard, "Aerial Census of Black Rhinoceros Using Stratified Random Sampling," East African Wildlife Journal, Vol. VII (August, 1969), p. 105.

²⁹ See J. Glover, "The Elephant Problem at Tsavo," East African Wildlife Journal, Vol. I (August, 1963), pp. 30-39; and P. Napier Bax and D. L. W. Sheldrick, "Some Preliminary Observations on the Food of Elephant in the Tsavo Royal National Park (East) of Kenya," loc. cit., pp. 40-53.

³⁰ For one example of scientific backing of elephant control, see J. Glover, op. cit., p. 38.



Figure 3.1 A striking example of elephant damage to a baobob tree; Tsavo National Park (East).



Figure 3.2 The same tree several weeks later. Destruction of woody vegetation by elephants in Tsavo is widespread and is producing profound changes in the park's vegetation.

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conservative and preservation-oriented an organization as the East African Wildlife Society advocated cropping of elephants to prevent the destruction of the Tsavo region. The Kenya National Parks, however, chose the wise course of attempting to obtain detailed scientific information concerning the ecology of elephants in Tsavo and their probable long-term impact on the Park's vegetation and animal life before undertaking any action. To this end a Research Project was begun at Tsavo and a distinguished biologist was invited to undertake the elephant study, the most crucial part of the research effort. What followed was one of the more disturbing chapters in recent conservation history in Kenya.

The Tsavo Research Project was racked by internal disputes and the elephant research came to a halt after little more than a year, when the Project's director resigned and left the country in May, 1968. The disagreements that had arisen within the Research Project soon reached the newspapers and the Tsavo elephant controversy blossomed as a full-scale public debate. It became impossible to sort out fact from fiction in the barrage of charges and counter-charges as the debate was waged in the public press.³¹ The most unfortunate aspect of the "Tsavo Elephant Controversy" was the acrimonious debate in the press, much of it carried out by journalists and others rather than those directly concerned with the

³¹ For contrasting views of the controversy, by two of the principals, see R. W. Laws, "The Last of the Elephants in Our Lifetime?", Sunday Nation (Nairobi), November 3, 1968; and P. Olindo, "The National Parks and the Elephant Research Project at Tsavo National Park," Sunday Nation (Nairobi), November 24, 1968.

project. The use of terms such as "murderers" and "massacre advocates"³² to describe scientists who appeared to favor elephant control, and the description of National Park's management policies as "laissez faire"³³ could only serve to harden positions regarding the serious question of future management policy for Tsavo. It is to be hoped that the scars left by the bitter public controversy over the Tsavo elephant problem will not prejudice future actions to ensure the ecological well-being of Tsavo National Park.³⁴

Tourist Impact. Another management problem of growing urgency is the impact of tourism and visitor accommodation on wildlife conservation areas. The increasing numbers of game-viewing tourists have already begun to have deleterious effects on some National Parks and Game Reserves in East Africa. In the Amboseli Game Reserve automobile traffic is worsening an already serious erosion problem. The light volcanic soils of the Reserve are now held together by only a very sparse vegetative cover and are easily disturbed. The flatness of the country makes it easy to drive off the roads and visitors have always driven wherever they liked. The

³² Anonymous, "Reprieve for Tsavo Elephants: Nature Plays Tricks on the Massacre Advocates," East African Reporter (Nairobi), October 4, 1968.

³³ R. W. Laws, "The Last of the Elephants in Our Lifetime?", loc. cit.

³⁴ It should be noted here that Mr. Perez Olindo, Director of the Kenya National Parks, has given public assurances that the Trustees will formulate whatever management plans are necessary to ensure the survival of the Tsavo ecosystem when they have obtained adequate scientific information on which to base their decisions. (P. Olindo, op. cit.)

Reserve is now criss-crossed with innumerable car tracks which are accelerating the erosion process. As far back as 1962, the Kenya Game Department expressed alarm at the rapid deterioration of grazing and cover caused by motor vehicles and urged that:

. . . immediate action must be taken, and that action can only be the construction of a system of properly ballasted roads and the restriction of cars to their use. Until this is done there can be no question of increasing visitors' accommodation and the present number of day visitors ought, in fact to be reduced.³⁵

Unfortunately, as late as 1969, although some road improvements had been made, no effective remedy to the problem of auto-induced erosion had been implemented and the deterioration of the reserve was proceeding unchecked.

Although problems of visitor impact have not yet become as serious elsewhere as they are in Amboseli it is likely, if tourism continues to expand at the present rate, that many other wildlife areas will begin to suffer from visitor-related disturbance. Park administrators and managers in East Africa are well aware of the growing threat posed by rapidly increasing visitor pressure and consideration is being given to ways of minimizing the disturbance of natural habitats. At a conference held in Kenya in 1969 representatives of East Africa's conservation agencies met to discuss this question along with other problems of wildlife conservation administration. Among the suggestions made concerning the question of visitor impact were: (1) that it might be necessary in the future to strictly confine all vehicles to the roads; and (2) that ultimately the limitation of the numbers and distribution of

³⁵Game Department Annual Report, 1962, p. 5.

visitors could well become an important part of conservation area management plans. It was further suggested that ideally, visitor accommodation should be sited on the periphery of conservation areas and not within them in order to reduce the impact of the elaborate facilities necessary to accommodate tourists and of the staff required to operate and maintain them.³⁶

Conservation and Economics: Conflicting Goals. There can be little doubt that management policies like those presented above would have beneficial effects on the natural environments of conservation areas, but are such policies feasible? Will it be possible to place limitations on the number of visitors that may enter National Parks and Game Reserves, in view of the understandable desire of both private investors and governments to maximize the economic benefits derived from wildlife conservation areas? The position that wildlife must pay its own way was forcefully stated by Kenya's Minister for Tourism and Wildlife in his address that opened the First Wildlife Conference for Eastern Africa. He told the assembled conference participants that,

For our wildlife to survive we must be able to show that our wildlife resources are bringing and will continue to bring in economic return to our countries. We must be able to show that conservation pays. Otherwise competing economic land uses will gradually reduce these resources, and endanger their future.

In Kenya the main economic value of our wildlife lies in the tourists who come to visit us. (italics mine)

³⁶ H. Lamprey, et al., "The Impact of Tourism on National Parks in Eastern Africa," Committee Report, First Wildlife Conference for Eastern Africa, Voi, Kenya, March 30, 1969.

The Minister did express concern over the question of visitor impact, however, continuing,

We are aware however that the human pressures on areas set aside for the protection of fauna and flora is continually increasing. Just how far can we go? What needs to be done to ensure that our wildlife makes the maximum possible contribution to national development, without adversely affecting the conservation of this resource?³⁷

The necessity that wildlife conservation areas produce substantial economic returns in order to justify their continued existence poses a dilemma for management planners. The goals of conservation and those of economic development, in wildlife areas, are not completely compatible; management plans designed to achieve maximum conservation benefits will yield less than maximum economic benefit, and management that aims to maximize economic returns will inevitably minimize conservation benefits. The question of where visitor accommodations should be located is a good case in point. The location of all accommodations outside wildlife areas would be an ideal solution from the conservation point of view; it would eliminate the undesirable environmental consequences of elaborate game lodge facilities and reduce visitor impact to that produced by day visitors in automobiles. The important questions then become (1) whether tourists will accept such accommodations and, more significantly perhaps, (2) whether investors (including Government Development Corporations) will risk capital in the construction of game-oriented hotels and

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Speech by the Minister for Tourism and Wildlife, Hon. S. O. Ayodo, to the First Wildlife Conference for Eastern Africa, Nairobi, March 26, 1969.



Figure 3.3 Kilaguni Lodge in Tsavo National Park (West), one of Kenya's most popular game lodges.

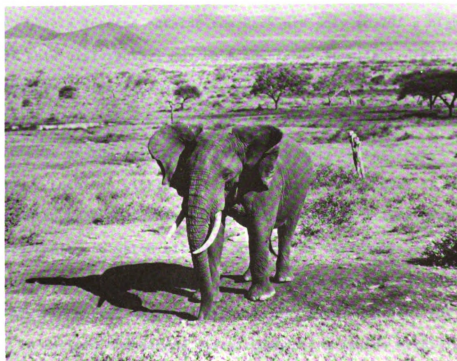


Figure 3.4 From the veranda at Kilaguni tourists can view elephants at close quarters and a variety of other animals attracted to the water hole, which is lighted at night.

lodges outside the wildlife areas when the economically more attractive alternative of location within them exists. The answer to both questions in East Africa today would appear to be no.

Demand for accommodation within wildlife areas is very high and where the alternative of accommodation in peripherally located hotels is also available, tourists' preference for the former is reflected in the hotels' rates. For example, Tsavo National Park has three game lodges located inside the park: Kilaguni Lodge, Ngulia Lodge, and Voi Safari Lodge. There are also two international tourist class hotels located just outside the Park boundaries, the Tsavo Inn at Mtito Andei, and the Park Inn at Voi. Both are situated close to Park entrances with game-viewing opportunities a matter of minutes away. The rates for the three lodges within the Park are about sh.140/ per person a night (approximately \$20) while the rates for the two hotels located outside the Park are only sh.70/ a night. Some of this differential may be accountable to slight differences in standards of food and service and the fact that the Tsavo and Park Inns are somewhat less modern than the lodges in the Park, but the greater part of the rate differential can only be attributed to location. Location within the Park offers tourists many of the things they come to East Africa for: the chance to hear a lion roar at night, the opportunity to watch wildlife at lighted waterholes, and the thrill of being "in the bush." These are all part of the attractions of an African safari and tourists will pay premium prices for them.

To satisfy the demand for accommodation inside wildlife areas East African governments have included substantial lodge building and modernization programs in recent development plans. Kenya's lodge-

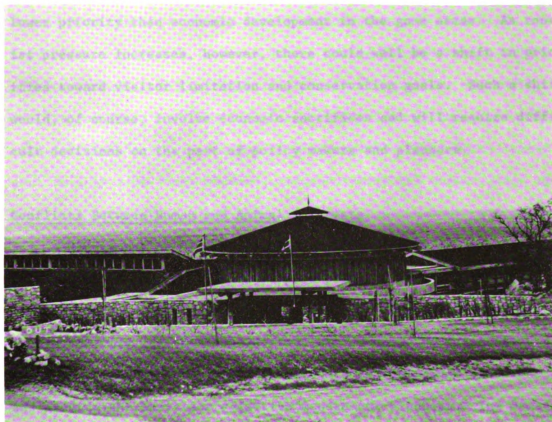


Figure 3.5 Evidence of the continuing investment in wildlife-based tourism in Kenya is the spectacular new Voi safari lodge, built on a hill overlooking the vast expanse of Tsavo National Park (East).

building program has already led to the construction of two new lodges in Tsavo National Park: Ngulia and Voi Safari Lodge, and future plans call for new lodges in Meru National Park, Amboseli and Mara Game Reserves and an additional lodge in Tsavo.³⁸ All of these new facilities will be located within prime wildlife conservation areas. So at present the conservation aspects of visitor management hold a lower priority than economic development in the game areas. As tourist pressure increases, however, there could well be a shift in priorities toward visitor limitation and conservation goals. Such a shift would, of course, involve economic sacrifices and will require difficult decisions on the part of policy makers and planners.

Conflicts Between Human and Animal Interests

Management problems like those outlined above are relatively less difficult to resolve than complex problems that involve basic conflicts between human and animal interests. Ecological problems, though they may generate controversy, are amenable to scientific solution; research can produce the answers to ecological questions and provide the basis for effective management planning. The management of tourists, although also at times a controversial issue, is basically a question of weighing economic benefit against conservation loss and attempting to increase economic returns to the highest level possible without producing irreparable damage to the natural environment. The search for solutions to these problems may produce disagreements about the means of achieving desired ends but the goals

³⁸ Republic of Kenya, Development Plan, 1966-1970 (Nairobi: The Government Printer, 1966), pp. 208-11.

being sought are generally agreed upon. This is not the case when basic human interests conflict with the interest of wildlife. Goals are not agreed upon; in fact, they are often diametrically opposed. The desire of a poacher for game meat or rhinoceros horn to sell is an obvious example of conflicting goals but there are others. Farmers want to clear new land for cultivation and protect their land from the depredations of wild animals. Pastoralists desire to see their herds increase and are loath to share scarce forage and water with wild grazing animals. The ultimate solution to the problems created by conflicting goals probably lies in education and change in peoples' values regarding the importance of wild animals. That much-desired goal is some time away, however, and government and conservation agencies must face the problems that arise from human-animal conflict now or risk the gradual erosion of the wildlife resource.

Illegal Hunting. Poaching, or illegal hunting, is probably the most widely known kind of human-animal conflict; the direct destruction of animals is dramatic and produces a strong public reaction and concern. Unregulated hunting has, in fact, been an important factor in the reduction of some animal populations in other parts of the world.³⁹ Hunting is not necessarily destructive, however, and if carefully regulated (as legal hunting is in Kenya) may even be beneficial to wildlife populations. Controlled hunting can replace natural mortality factors and operate to keep animal populations from

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Two classic examples of the impact of unregulated hunting on wild animal populations are the American Bison, hunted to the brink of extinction during the westward expansion of the American frontier, and the Passenger Pigeon, once the most abundant American bird, exterminated by uncontrolled commercial market hunting.

increasing beyond the capacity of the environment to support them.⁴⁰ Illegal hunting is a problem because hunting pressure cannot be controlled and may inflict serious damage on wildlife populations. This kind of uncontrolled hunting can result in the complete destruction of all large game animals in heavily hunted areas and in the widespread reduction or elimination of a few species that are particularly sought after because of their high trophy value.

Illegal hunting in Kenya today is basically of three types:

(1) meat hunting by individuals to satisfy the needs of themselves and their families; (2) trophy hunting by individuals and groups to earn cash from the sale of skins, ivory, and rhino horn; and (3) commercial meat hunting carried on by groups of poachers who sell the meat in local markets. The Game Department reports that illegal hunting of all types continues at high levels in many parts of the country, in spite of their strenuous efforts to control the activity. The most heavily poached areas are the Western provinces, forest areas close to settlement schemes, southern Machakos District, and the northern provinces.⁴¹ Severe poaching appears to be most prevalent where human populations at high densities live in close proximity to areas of game concentration. This is clearly the case in the first two heavily poached areas listed above, and in southern Machakos where recent immigration and settlement has contributed to an increase in

⁴⁰See R. Dasman, Wildlife Biology (New York: John Wiley & Sons, Inc., 1964), pp. 193-96.

⁴¹Game Department Annual Reports, 1964 and 1965, p. 15; and Game Department File 19/1-19/5, Divisional Game Wardens Annual Reports, 1968.

illegal hunting. In the northern provinces the high level of poaching in recent years has been attributed to armed gangs of shifta operating in that sparsely populated and hard to police area.⁴²

Some idea of the amount of illegal hunting that takes place in Kenya can be gained from the number of cases brought before the courts by officers of the Game Department under the Wild Animals Protection Act. In 1964 the number of cases was 607⁴³ and in 1965, 660.⁴⁴ The number of hunting offenses prosecuted represented only a small percentage of the total amount of illegal hunting, however, as the vast majority of offenders go unapprehended or unprosecuted. The Game Warden at Kitale, for example, who had initiated the prosecution of 107 offenders during 1964, reported that with additional staff and improved facilities his stations could bring to court well over 1,000 cases a year.⁴⁵ The Game Department realizes that it cannot hope to completely eliminate poaching and views its anti-poaching activities as a kind of holding action designed to contain the incidence of illegal hunting until a final solution to the problem can be achieved through education and citizen cooperation.⁴⁶

An accurate assessment of the impact of poaching on Kenya's wildlife resources is difficult because the magnitude of illegal

⁴²Game Department File 19/5, Game Warden Northern Division, Annual Report, 1968 and Game Warden Isiolo, Annual Report, 1968.

⁴³Game Department Annual Reports 1964 and 1965, p. 16.

⁴⁴Ibid., p. 43.

⁴⁵Ibid.

⁴⁶Ibid., p. 16.

hunting activity cannot be estimated with any degree of confidence. The impact of the three general types of illegal hunting does differ though, and should be considered. Meat hunting by individuals for their own requirements is the least serious poaching problem. The man who kills an occasional buck to feed his family presents no great danger to wildlife survival and the Game Department has always tended to be lenient in the application of game laws to this kind of subsistence poaching. Commercial meat hunting is another matter, however. Professional hunting for meat can be extremely destructive of wildlife populations. In Nigeria Petrides has attributed the present scarcity of wildlife to overhunting, especially by professionals, resulting from the high prices paid for bush meat.⁴⁷ This kind of hunting appears to be fairly well contained in Kenya and although cries of alarm are sounded periodically in the press and popular journals about the "slaughter of wildlife" by poaching gangs there seems at present to be little danger of serious long-term damage to the nations wildlife from commercial meat hunting.

An example of the actual level of commercial poaching compared to what had been suspected comes from the Serengeti area in Tanzania. Estimates of the annual kill by poachers around the Serengeti National Park were as high as 150,000 animals. The Talbots' study of wildebeest mortality factors, however, suggested that the poachers' take of wildebeest, by far the most numerous animal in the area, could

⁴⁷G. A. Petrides, Wildlife and National Parks in Nigeria (New York: American Committee for International Wildlife Protection, Special Publication No. 18, 1965), pp. 11-16.

not be more than a few thousand animals a year.⁴⁸ The authors go on to point out that this low level of poacher kill is undoubtedly due to the vigilance of the Parks and the Game Department, which must be continued if increased poaching is to be prevented.

The impact of illegal trophy hunting is confined to a few species of high value; in Kenya the most sought after animals are elephant, for ivory, rhinoceros, for the horn, and leopard, for its skin. The illegal trade in trophies is widespread in East Africa and has gone on for many years because of the continuing high prices paid for the trophies. In recent years ivory has brought an average of sh.20/ per pound and rhinoceros horn, in great demand in Asia for its alleged curative and aphrodisiac powers, has sold for as high as sh.150/ per pound on the legal market.⁴⁹ High quality leopard skins may sell for £100 or more and average quality skins have sold at auction for an average price of £84.⁵⁰ The poacher, of course, receives much less than this from a trader or middleman but gets a high enough price to make poaching, in spite of the risks involved, a lucrative activity, especially for a subsistence farmer who hunts part-time.

Illegal hunting probably constitutes a significant mortality factor for these three species but only the rhinoceros would appear to be in immediate danger from poaching. Rhino hunting is a major

⁴⁸L. M. Talbot and M. H. Talbot, The Wildebeest in Western Masailand, East Africa, Wildlife Monograph No. 12 (Washington, D.C.: The Wildlife Society, 1963), pp. 79-80.

⁴⁹Game Department Annual Reports 1964 and 1965, p. 42.

⁵⁰Ibid.

problem in all areas where the species is still found and is especially prevalent in southeastern Kenya. The rhino has been greatly reduced or eliminated from much of the Rift Valley and the northeast by poaching⁵¹ and the survival of the species in all areas outside of National Parks and Game Reserves depends, in large measure, on the ability of the Game Department to control the level of poaching in those areas. Elephant have been heavily hunted, both legally and illegally, in the past and have been eliminated from parts of western and central Kenya and from much of the area around Lake Rudolf. In other parts of the country, however, elephant are one of the few species that have been increasing in recent years.⁵² Not only is the elephant in no danger from illegal hunting today, but the species could probably withstand a considerably higher level of hunting pressure.

Illegal hunting of leopard has been of great concern in eastern Africa for some years. The illegal trade in leopard skins is thought to be very large and although some poachers and individual dealers are prosecuted from time to time, authorities have been unable to cause a major disruption of the trade, much less eliminate it. The ultimate solution to the problem of the leopard skin trade lies not in Africa but in Western Europe and North America where the major demand is located. If the demand for leopard skins could be cut off, the trade in East Africa would dry up and poaching of leopard would

⁵¹D. R. M. Stewart and Joyce Stewart, "The Distribution of Some Large Mammals in Kenya," Journal of the East Africa Natural History Society, Vol. XXIV, No. 3 (June, 1963), p. 8.

⁵²Ibid., p. 7.

cease to be a serious problem. Legislation forbidding the importation of leopard skins has been considered in several of the large importing countries and although none has yet been approved there appears to be a good chance that such legislation will soon come into effect.⁵³ Until the demand is eliminated leopard will continue to be heavily hunted, but the species is widely distributed in Kenya, and in East Africa in general, and its ability to survive on a variety of small prey animals and its secretive and nocturnal habits should enable the species to survive.⁵⁴

Illegal hunting has been a serious problem in Kenya in the past and could become so again. In recent years, though, the vigorous anti-poaching campaigns of the Game Department and other wildlife agencies have been successful in keeping illegal hunting from reaching very damaging levels throughout the country. There are still some local game populations and some species, like rhinoceros, that may be threatened by poaching but if the present effectiveness of wildlife agencies in this area is maintained illegal hunting should not endanger the survival of the nation's wildlife resources.

Land Use Conflict. The most serious long-term threat to the future of wildlife in Kenya comes, not from the direct impact of illegal hunting, but rather from the indirect effects upon wild animal populations of habitat alteration and destruction. Wild animals depend upon their habitats for the resources necessary to their survival.

⁵³ Legislation forbidding the importation of the skins of leopards and other endangered species was defeated by a narrow margin in the U.S. Congress; New York State has recently passed a similar bill.

⁵⁴ Stewart and Stewart, "The Distribution of Some Large Mammals in Kenya," loc. cit., p. 4.

The habitat requirements of wild animal species vary, each species requiring particular kinds and combinations of food in addition to other resources such as water and cover. Vegetation is probably the most important component of the habitat as it supplies the basic food source for all animal food chains. Alteration of the habitat which effects changes, either qualitative or quantitative, in the vegetation will affect the capacity of the habitat to support wildlife. The more drastic the changes in vegetation the more profoundly will carrying capacity be affected. Because animal species differ in their habitat requirements vegetation change will affect each species differently. A particular change in vegetation may lower the carrying capacity for one species, increase it for another, and make the habitat completely unsuitable for a third. Vegetation change, then, whatever its precise impact on particular animal species, inevitably produces changes in the composition and density of wildlife populations.⁵⁵

The most significant agent of habitat alteration in Kenya, as elsewhere, is man. Although animals can effect some changes in vegetation through their own activities, drastic, large scale changes in vegetation today are usually the result of man's use of the land.⁵⁶ Arable agriculture produces severe alterations of natural ecological systems, involving the removal of natural vegetation and the substitution of a few domesticated plants for the large variety of wild

⁵⁵See R. F. Dasmann, Wildlife Biology (New York: John Wiley & Sons, Inc., 1964), pp. 59-86 for a good general treatment of the subject of wildlife habitat and the impact of habitat alteration on wildlife populations.

⁵⁶Elephants, as noted above, are an obvious exception, being capable of producing widespread and profound changes in natural vegetation.

plants that originally covered the ground. Pastoral agricultural activity, though less severe in its impact, also results in changes in vegetation. Domestic grazing animals, with their specific food preferences can, especially at high densities, cause changes in the species composition of grassland vegetation.⁵⁷ Other human activities associated with agriculture also lead to habitat alteration. Gathering of firewood and various wild plants for food or other uses may, over a long period, have a significant impact on vegetation. Charcoal making can remove a substantial proportion of the trees and larger shrubs from an area in a relatively short time. Fire, which has a profound effect on vegetation, inhibiting the growth of woody plants and favoring grasses, is a commonly used tool of agriculturalists. Fires set by farmers and pastoralists often burn uncontrolled, affecting wide areas of the surrounding countryside.

The impact of man's agricultural activities on the natural environment is not a new phenomenon in Kenya; it is centuries old. However, the severity of habitat alteration has increased enormously in recent years as a result of the ever greater demands being placed upon the environment by rapidly growing numbers of people and livestock. As people and their stock use more and more land, and use it more intensively, wildlife habitats will continue to degenerate and disappear. There are today a number of areas in Kenya where man's use of the land conflicts dramatically with the goals of wildlife conservation. The future of much of Kenya's wildlife and some of its most spectacular tourist attractions depends on the solution of these conflicts.

⁵⁷Dasmann, op. cit., pp. 78-81.

Pastoral Land Use. Wildlife conservation problems in the pastoral areas of Kenya result primarily from overstocking of domestic animals and the consequent deterioration of the range. In the past natural mortality factors operated to keep livestock numbers down and overstocking was rarely a problem. The introduction of modern veterinary medicine reduced mortality rates drastically, however, and livestock numbers have been a cause of concern for many years. All efforts to limit the livestock of traditional pastoralists have failed and there has been severe overgrazing in many areas. Overgrazing by domestic cattle results in the destruction of perennial grasses and a lowering of the carrying capacity of the range for wildlife as well as for cattle.⁵⁸

The situation in the Masai Amboseli Game Reserve is a striking example of wildlife conservation problems in pastoral areas. The Reserve is badly overstocked and has suffered from severe overgrazing and erosion. The Masai are tolerant of wildlife and their cattle have always shared the range peacefully with wild grazing animals. The wild grazers consume different food plants from those eaten by cattle and so do not compete directly with the Masai stock. But the heavy grazing pressure of the large numbers of cattle has lowered the carrying capacity of the range and resulted in a marked reduction of wildlife populations.

The deterioration of the Amboseli Reserve has been a continuing problem for conservation authorities.⁵⁹ They have long sought the agreement of the local Masai to a 200 square mile stock-free area

⁵⁸Ibid.

⁵⁹ See the terms of reference of the 1956 Game Policy Committee, above.

around the Ol Tukai swamp. In March of 1967 the local District Council approved the stock-free area and it was reported that an American foundation had agreed to finance a series of bore holes to provide an alternate supply of water outside of the proposed "inner sanctuary" of the Reserve. The local people, however, resented this attempt to restrict their activities and publicly rejected the Council's action at a baraza⁶⁰ at Ol Tukai late in 1968. They stated their position in a memorandum handed to the chairman of the Council:

We the undersigned residents of the Amboseli area, wish to bring to your councils notice the fact that after careful consideration of the above mentioned area (which we are given to understand that your council has agreed to allocate exclusively for game and thereby forcing us to move out without our consent or knowledge) we absolutely reject as nothing but sheer daydreaming the idea of extending the Amboseli Game Reserve from 30 square miles to 200 square miles.

.
With regard to an alleged large sum of money promised by a certain American millionaire and which we are given to understand that it was proposed to be used to finance the development of the area adjacent to the 200 square miles, we are notifying him by copy of this letter not to waste his money at all because we are financing the project of water supply, dips, etc., ourselves through self-help schemes and our own individual and collective efforts.⁶¹

The memorandum was signed by 33 residents of the Ol Tukai area. It is evident from the reaction of the local people that the concept of District Council Game Reserves, in which revenues from tourism are shared with the Council, may have gained the support of Council members, but has not convinced the average man of the value of wildlife.

There are other potential conflicts elsewhere in the Masai

⁶⁰ baraza; Swahili, a public meeting; used commonly throughout East Africa.

⁶¹ Game Department File 19/2, Masai Amboseli Game Reserve Annual Report 1968.

district of Kajiado. The Athi-Kapiti plains in the northern part of Kajiado District are adjacent to the southern boundary of Nairobi National Park, and the plains form an integral part of the range of much of the Park's wildlife population. The Park itself is small, only 45 square miles, but it serves as a dry season concentration area for large numbers of plains game. The Park's permanent water supply draws an astonishing number and variety of animals, which makes it one of Africa's greatest tourist attractions.⁶² But the future of the Park is now threatened by planned changes in land use on the Athi-Kapiti plains to the south. In the near future the Masai pastoralists in that area will abandon their traditional forms of land tenure and assume legal ownership of large ranches. A group ranching scheme is planned, whereby groups of 12-15 Masai families will cooperatively own and manage large cattle ranches. The transition to land ownership and modern ranching is economically desirable but presents some problems in terms of wildlife conservation. As land owners the Masai ranchers could fence their land, thus cutting off the migration route to the Park. They would also be legally entitled to shoot unlimited numbers of game animals on their land. Conservation authorities are hopeful that the ranchers will cooperate in a sustained yield game cropping scheme which would ensure the survival of the Athi-Kapiti herds while producing income for the ranchers. But there is no guarantee that the ranchers will cooperate and if they do not the wildlife populations of Nairobi National Park may be permanently reduced to the low levels that the Park supports during the wet season.

⁶²J. B. Foster and D. Kearney, "Nairobi National Park Game Census, 1966," East African Wildlife Journal, Vol. V (August, 1967), pp. 112-20.

In Narok, the other Masai district, the people have not yet begun to move toward modern ranching and land ownership but such developments cannot be too far in the future. When modern developments do come, the wildlife resources of Narok District, including the Mara Reserve, will be subject to the kinds of pressures now evident in Kajiado. The future of the spectacular wildlife resources of Masailand depends, in large measure, on whether these new forms of organization adopted by the Masai will allow the coexistence of cattle and wildlife that was characteristic of traditional pastoralism.

Agricultural Land Use and Game Control. The use of land for arable agriculture produces a severe and long-lasting impact upon wildlife populations. Alteration of the natural landscape is almost complete and the high population densities characteristic of many agricultural settlements create conditions that do not favor the survival of the larger game animals, although many of the smaller animals are able to survive, and even thrive, on or near cultivated land. Large animals, though, are incompatible with agriculture and in the heavily populated areas of the central highlands and western Kenya large game has been exterminated or reduced to small remnant populations occupying the few remaining patches of natural cover. Where agricultural settlement is less dense some game remains. In these areas, and especially where farming land borders areas of game concentration, conflict between people and wild animals is direct and often violent. Destruction of crops by wildlife is a problem in many areas of Kenya and serious injuries and deaths caused by wild animals are not uncommon.

The necessity to provide protection from personal injury and

property damage caused by wild animals has made game control an important part of wildlife management in Kenya. The Government's position on the control of wild animals was clearly stated in a Sessional Paper published in 1959:

The Government does recognize a responsibility, arising from its declared game preservation policy, to assist in the control of scheduled game animals as far as it is practicable to do so. Control is an important function of the Game Department and the Government intends that, within the limits of finance available, such control shall be as effective as is practicable.⁶³

Game control is carried out primarily by the Game Department but the National Parks and the Forest Department also engage in control activities and private individuals, of course, retain the right to protect themselves and their property from wild animals.

Game control in Kenya today is provided by several methods including game-proof barriers and the shooting of animals thought to be responsible for property damage or considered to be a threat to human safety. Control was provided almost exclusively by shooting, in the past, and this continues to be the principal method of control in most areas of the country. The Game Department has estimated that on the average 40 per cent of its time is devoted to control work,⁶⁴ and a substantial number of animals are shot each year by department personnel.⁶⁵ The large, dangerous game animals figure prominently in

⁶³Colony and Protectorate of Kenya, A Game Policy for Kenya, Sessional Paper No. 1 of 1959/60 (Nairobi: The Government Printer, 1959), p. 5.

⁶⁴D. W. J. Brown, "Game Control in Kenya," East African Agricultural and Forestry Journal, Vol. XXXIII (Special Issue, June, 1968), p. 210.

⁶⁵See Table 3.4 for the number of animals of six major species shot on control annually by the Game Department during the period 1956-1968.

Table 3.4

ANIMALS DESTROYED ON CONTROL BY KENYA GAME DEPARTMENT

<u>Species</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
Elephant	285	154	220	364	329	339	346
Hippopotamus	7	-	36	65	65	32	34
Rhinoceros	11	17	45	93	32	40	17
Buffalo	193	214	475	463	399	373	300
Lion	5	17	31	27	27	66	53
Leopard	6	7	16	14	14	22	18

98

Note: This table records only the number of animals of these six major species actually destroyed on control by officers of the Kenya Game Department. Substantial numbers of animals of other species are also destroyed on control by Game Department officers as are large numbers of vermin (especially hyena and baboon), although the Department does not have direct responsibility for vermin control. In addition to the number of animals listed here many others are shot by private landowners in defense of life and property. The Game Department estimates that the number of animals destroyed by private landowners greatly exceeds the Department's figures, except in the case of elephant, rhinoceros, and hippopotamus.

Table 3.4 (continued)

<u>Species</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>
Elephant	449	428	722	471	326	427
Hippopotamus	60	42	68	46	13	106
Rhinoceros	20	41	43	41	25	9
Buffalo	418	534	1,252	1,525	903	711
Lion	39	30	20	28	45	26
Leopard	12	16	19	24	10	25

Source: Republic of Kenya, Game Department Annual Reports, 1956-1965 and Game Department
File 19/2, Game Warden's Annual Reports, 1966-1968.

control efforts but the Game Department is called upon to destroy an amazing variety of animals in the course of their work. The list of animals destroyed in the Department's Central Division totals 34 species, including monkeys, porcupines, and crested cranes as well as most of the common herbivores and carnivores (see Table 3.5). In recent years special methods have been developed for the control of carnivores because of their great value as tourist attractions and their dwindling numbers. It has proven to be as easy in many cases to live-trap the larger carnivores as to shoot them, and this method is now used wherever possible. Box traps are used and the captured animals are translocated to National Parks or Game Reserves. Leopards in particular are frequently controlled in this way and in 1966, 26 of these animals were live-trapped and moved to wildlife sanctuary areas.⁶⁶

Control shooting, as the most common method employed by the Game Department, gives some indication of the level of human-animal conflict in Kenya. The number of animals shot on control shows a sharp peak in the mid-1960's, particularly in the case of buffalo and elephant (see Table 3.4). This evidence of increasing conflict between the human population and wild animals may be attributed to the rapid expansion of agricultural settlement during the period immediately following the granting of independence to Kenya. Government-organized settlement schemes were responsible for settling tens of thousands of people on new land where they were often in close proximity to areas of wildlife abundance. This was particularly true in

⁶⁶Brown, "Game Control in Kenya," loc. cit.

the Kenya Highlands, where new settlement schemes established dense agricultural populations on the slopes of Mount Kenya and the Aberdare Mountains. Farmland soon extended to the very edge of the mountain forests which contained large populations of game animals. Crop raiding animals, especially buffalo, quickly became a serious problem for the farmers and required extensive control shooting. Table 3.5 gives the complete control data for the Department's Central Division which is responsible chiefly for the area of the Highlands. The magnitude of the game control problem and the intensity of the human-animal conflict in this area is revealed by the number and variety of animals destroyed each year by the Game Department. This continuing clash between human and animal interests in the new settlements of the Kenya Highlands demonstrates the essential incompatibility of wildlife with agricultural land use and suggests that conflict is inevitable unless the human and animal populations can be separated.

Separation of wildlife areas from adjacent human communities provides a solution to game control problems that reduces the necessity of destroying large numbers of animals and at the same time offers better protection of human interests. In Kenya game-proof barriers have been erected in several areas of intense human-animal conflict. The best example of this method of game control is the combination of 27,000 yards of fenced ditch and 13,000 yards of moat which surrounds the Treetops salient of the Aberdare National Park, effectively sealing it off from the nearby agricultural land.⁶⁷ Game barriers have also been under construction on the slopes of Mount

⁶⁷ See above, Chapter II; and F. W. Woodley, "Game Defence Barriers," East African Wildlife Journal, Vol. III (August, 1965), pp. 89-94.

Table 3.5

ANIMALS DESTROYED ON CONTROL, CENTRAL DIVISION 1966-68

	<u>1966</u>	<u>1967</u>	<u>1968</u>
Buffalo	1,411	788	547
Elephant	113	105	145
Rhinoceros	9	11	9
Hippopotamus	13	3	13
Lion	9	23	6
Leopard	11	4	6
Wild Dogs	6	3	-
Giraffe	2	14	3
Eland	82	71	48
Zebra	100	89	68
Forest Hog	-	22	49
Hartebeeste	3	3	7
Waterbuck	63	63	71
Impala	52	2	42
Crocodile	-	1	1
Bushbuck	50	52	92
Topi	-	-	8
Grant's Gazelle	28	37	38
Thomson's Gazelle	131	97	48
Oryx	-	-	1

Table 3.5 (continued)

	<u>1966</u>	<u>1967</u>	<u>1968</u>
Warthog	47	93	25
Bush pig	-	59	172
Reedbuck	16	12	17
Steinbuck	-	-	29
Duiker	-	4	7
Blue Duiker	-	-	6
Hyena	*74	1)missing or	103
Baboon	205	8)incom- plete	418
Jackal	*36	-	29
Colobus Monkey	807	516	182
Sykes Monkey	187	565	2,183*
Blue Monkey	-	-	42
Porcupine	-	-	56
Crested Crane	-	-	6
	*Nanyuki station only		*Forest Dept. 1,433 of this

Source: Kenya Game Department, File 19/2, Divisional Game Warden Central Division, Annual Reports, 1966-1968.

Kenya and although unfinished they have already reduced the level of control shooting in that area. The efficacy of game barriers is demonstrated by the sharp decrease in the number of buffalo destroyed on control in the Highlands after 1966 (see Table 3.5). The almost 50% reduction in buffalo control from 1966 to 1967, and the continued downward trend in 1968, is the direct result of the construction of new barriers to game movement. Game fences have also proved effective along part of the boundary of Nairobi National Park, and in the Ngong Hills near Nairobi where agricultural settlement was made possible by the erection of a game fence.⁶⁸

The intensive game control effort in the Highlands, largely a result of the encroachment of human settlement on wildlife land, reflects the conflict generated by competition between men and animals for the use of land. Although this example is one of the most dramatic in Kenya, it is not the only one. There are many other areas of the country where the movement of agricultural pioneers into wild land threatens to eliminate or diminish wildlife populations through habitat destruction, control shooting, poaching, and other human activities.

The Shimba Hills Settlement Scheme in southeastern Kenya was established in 1952 on the lower slopes of the hills below a Forest Reserve. The Reserve carried a moderate population of game animals, including the very rare (in Kenya) sable antelope. Demand for game control by the settlers has been high and buffalo and elephant, especially, are shot in substantial numbers. Poaching is also a problem and it has been reported that the villagers below the Reserve

⁶⁸Game Department File 19/2, Game Warden Southern Division, Annual Report 1968.

deliberately burn the grass on the lower slopes to attract sable, buffalo, and other grazing animals.⁶⁹ The Shimba Hills Reserve is a relatively small area and the game populations it supports are not large. The sable antelope in particular numbers less than 100 animals in the reserve and this small group is the largest concentration of sable left in Kenya.

The expansion of agricultural land use in Kenya has even begun to encroach upon the dry savanna areas of the southern part of the country. In Narok it is wheat that competes for land with wildlife. In 1968 there were 40,000 acres of land being used for wheat in Narok District and further expansion to 60,000 acres was planned for 1969. The District Game Warden, in his 1968 Annual Report, requested that a formal, written policy in regard to game control and wheat schemes be established. "It is well known," he wrote, "that game and wheat do not go together, therefore game has to be controlled in the wheat scheme areas."⁷⁰ The warden also strongly opposed a new plan to expand wheat cultivation in Block 58, and urged that a high level conference be held to decide in which areas of Narok District the survival of game animals was to be considered essential, and in which areas wheat schemes were to come first. Where wheat came first, he ventured, the slaughter of game animals might become necessary policy.

Small scale, subsistence agricultural occupancy can also have damaging effects on wildlife populations and this form of land use is much more widespread than the extensive forms of agriculture

⁶⁹P. E. Glover, Report on An Ecological Survey of the Proposed Shimba Hills National Park, Kenya National Parks, 1968, pp. 99-100.

⁷⁰Republic of Kenya, Game Department File 19/2, Game Warden, Narok, Annual Report, 1968.

exemplified in the Narok wheat schemes. In the Lambwe Valley of South Nyanza District a new Game Reserve was recently gazetted to protect a rich wildlife area containing a variety of game animals including the rare roan antelope. The new Reserve, only four miles wide and 25 miles long, is already being threatened by agricultural settlement. Long avoided by settlers because of tsetse, the valley is now being invaded by farmers who have settled around the Reserve. Some have even cleared farms within the boundaries of the Reserve.⁷¹ Expulsion of the squatters and fencing around the Reserve will probably be necessary if the Lambwe Valley Game Reserve is to survive at all.

Movement of agricultural pioneers into areas long considered marginal for human occupancy is an increasingly common phenomenon in Kenya. Population growth in the old, traditional areas of compact settlement is producing intolerable land pressure in many communities. More and more people are abandoning uneconomic land holdings to seek subsistence elsewhere -- in the cities, as hired farm laborers, and some as pioneers in the marginal wild lands. The migrants to the arid fringes represent a new and potentially very serious threat to Kenya's wildlife resources. The arid bushlands of Kenya have long been the most secure refuge for the nation's wild animals, but now even this, last sanctuary is under attack. The following chapter will present a case study of agricultural migration into a wildlife-rich area of southeastern Kenya.

⁷¹A. P. Achieng, "The Olambwe Valley: A Problem in Multiple Land Use." East African Agricultural and Forestry Journal, Vol. XXXIII (Special Issue, June, 1968), pp. 8-11.

CHAPTER IV

THE HUMAN INVASION AND THE DISPLACEMENT OF WILDLIFE: PIONEER SETTLEMENT ON THE ARID FRINGES

Migration, the movement of human populations into empty, vacated, or underpopulated areas of the earth, has long been among the most significant phenomena in shaping man's impact on his environment. The African continent has not escaped the effects of this world-wide human process. The importance of migration in Africa is perhaps best summarized by Prothero, who comments, "Population movements, both great and small, over long and short distances, have been a feature of Africa in the past and are one of its most important demographic features at the present day."¹ Migration is a complex process which may be motivated by a wide variety of factors. Among the factors that have induced migratory movements in Africa are: (1) pastoralism, (2) hunting and gathering, (3) warfare, (4) slavery, (5) trade, (6) labor, (7) pilgrimage, (8) political administration, and (9) land pressure. All of these factors have played a role in migration patterns in East Africa in the past and many of them continue to influence contemporary population movements in that part of the continent.²

¹R. Mansell Prothero, Migrants and Malaria (London: Longmans, Green and Co. Ltd., 1965), p. 25. He adds succinctly that "There are few contemporary problems in the fields of administration and of economic and social development in Africa which are not influenced by population mobility."

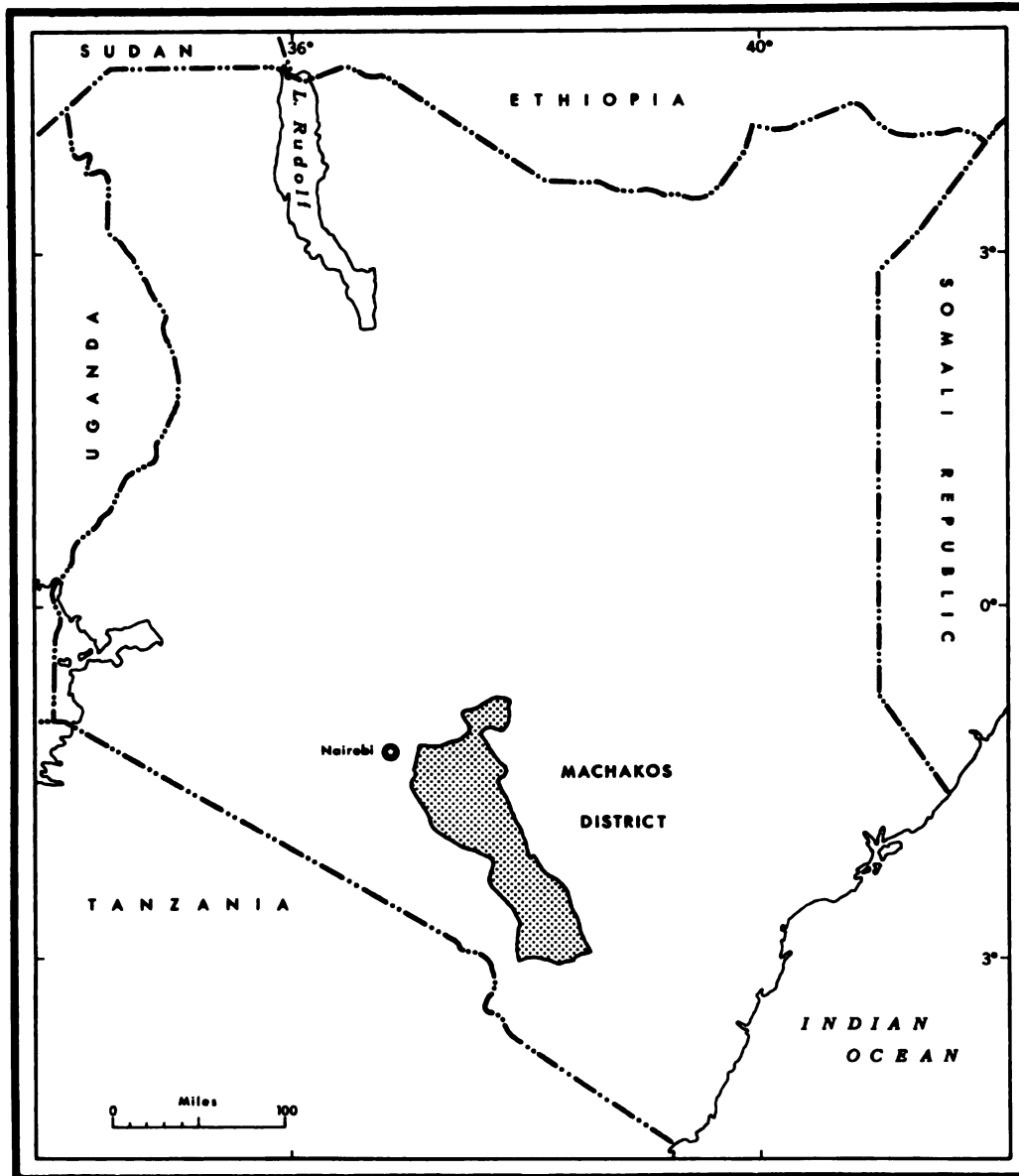
²A. W. Southall, "Population Movements in East Africa," Essays on African Population, ed. K. M. Barbour and R. M. Prothero (New York: Praeger, 1962) summarizes past and present population movements in East Africa.

In Kenya land pressure has been and continues to be one of the major inducements to migration. Increasing pressure of rural populations on the available land resources resulted in part from the alienation of large areas for European settlement and the administrative restrictions on African settlement. The limited availability of land for agricultural settlement has long been a pressing problem and dissatisfaction with the amount of land available for cultivation in tribal homelands was a major factor in the movement of Kikuyu and other peoples into the rift valley province as squatters on European farms.³ The intensity of the land pressure problem, particularly in the Kikuyu Highlands, is evidenced by the major role played by land problems in the development of the "Mau-Mau" uprising.⁴ Other parts of Kenya also have had a history of land problems. In many areas of the country the shortage of good agricultural land has resulted in the movement of large numbers of people onto land that is, at best, marginal for sustained subsistence cultivation. This chapter will examine the underlying causes of a comparatively small-scale case of group migration in Kenya, involving, primarily, the movement of people of one ethnic group, the Kamba, within one district, Machakos (see Map 4.1).

Machakos District is one of the two administrative districts

³Ibid., p. 186. For a more comprehensive treatment of population movements in Kenya, see S. H. Ominde, Land and Population Movements in Kenya (London: Heinemann, 1968). This work provides a detailed analysis of population movements in Kenya based on the 1962 as well as the 1948 census.

⁴C. G. Rosburg, Jr. and J. Nottingham, op. cit., Introduction, p. xviii.



Map 4.1

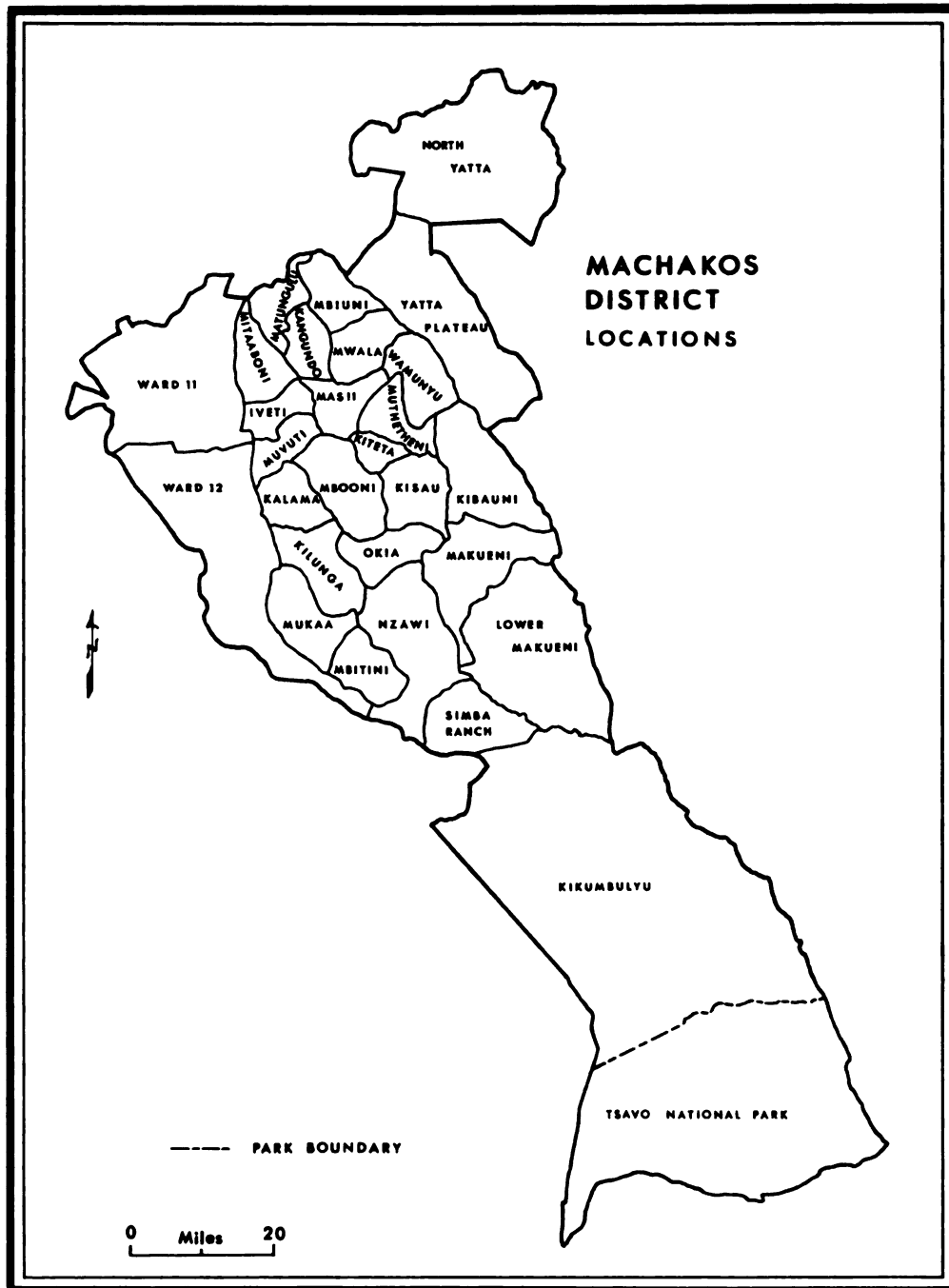
Machakos District in Kenya

encompassing the traditional Kamba homeland, Ukambani, in southeastern Kenya. The district lies to the southeast of the Kikuyu Highlands and is bounded on the west and south by the Masai district of Kajiado. To the east lies Kitui, the other Kamba district (see Map 3.4). The total area of Machakos District is approximately 5,790 square miles.

The landscape of Machakos District may be described as a plateau surface, sloping gradually from the northwest to the south and east, where the elevations average about 2,000 feet above sea level. The most prominent feature of the district's landscape is the Machakos Hills, rising to almost 7,000 feet, located in the northwest part of the district. Rainfall varies enormously across the district: from nearly 50 inches annually in some parts of the hills to about 10 inches in the east and south. Vegetation in the drier parts of the district is dry bushland with some grass and the soils are generally latosols typical of dry tropical regions. In the hill region soils are more variable with some rich alluvial soils and areas of poor stoney soil interspersed within the more common latosols.

The total population of the district at the time of this survey was estimated at over 600,000 people. Population densities are highest in the northwest where, north of Machakos township in the hills, location⁵ densities reach 500 to 750 persons per square mile (see Maps 4.2 and 4.3). Southeast of Machakos township densities in the hills range from 250 to 500 persons per square mile. The southern half of the district is much less densely settled, with population

⁵A location, in Kenya, is an administrative subdivision of a district; there are 25 locations in Machakos District.



Map 4.2

Machakos District: Locations

densities as low as 2 persons per square mile in some parts⁶ (see Table 4.1).

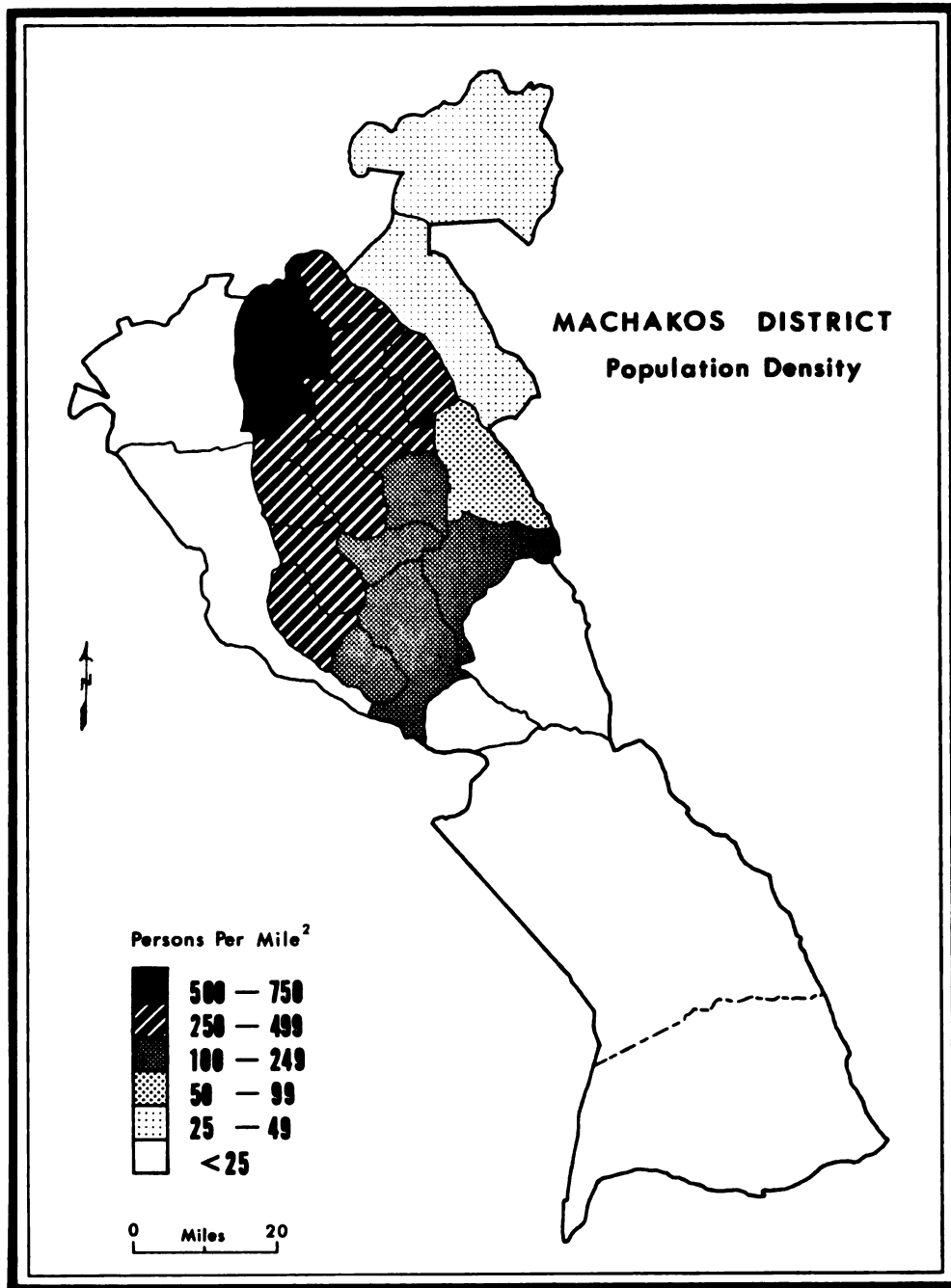
The Mbooni Range in the Machakos Hills was apparently the first area in Ukambani settled by the Kamba. Traditions suggest that they were once a compact group occupying the region called Ulu (literally "up there") in the hills and that from there they expanded into Kitui and south into Kikumbulyu. This outward movement from Ulu appears to have taken place during the eighteenth and nineteenth centuries beginning with an eastward movement into Kitui early in the eighteenth century followed by an expansion southward throughout Ulu into Kikumbulyu during the nineteenth century.⁷

Kikumbulyu is the southernmost location in Machakos District (Map 4.2); it stretches from Kiboko south to Mtito Andei and from the Athi River in the east to the Chyulu Hills in the west. In the last five years the population density of the southern half of Kikumbulyu has increased rapidly. This growth has involved the movement of Kamba from the densely populated sections of central Machakos to the less densely settled southern part of the district. The area being settled, called Lower Kikumbulyu, is only marginally suitable for sustained subsistence cultivation because of the low annual rainfall. Cattle raising has been precluded by the presence of the tsetse fly, the

⁶For further details relating to population densities in this and other Kenya districts, see W. T. W. Morgan and N. Manfred Shaffer, Population of Kenya (Nairobi: Oxford University Press, 1966).

⁷J. Middleton and G. Kershaw, The Kikuyu and Kamba of Kenya (London: International African Institute, 1965), p. 68.

G. Lindblom, The Akamba of British East Africa (Uppsala: Appelberg, 1920), p. 10.



Map 4.3

Machakos District: Population Density

Source: W. T. W. Morgan and N. Manfred Shaffer, Population of Kenya (Nairobi: Oxford University Press, 1966), p. 21.

Table 4.1
MACHAKOS DISTRICT
POPULATION, AREA, AND DENSITY BY LOCATION

<u>Location</u>	<u>Total Population</u>	<u>Area in Sq. Miles</u>	<u>Density Per Sq. Mile</u>
Mbiuni	15,923	60	265.4
Mwala	17,518	70	250.3
Kangundo	36,875	58	635.8
Matungulu	40,395	70	577.1
North Yatta	11,421	436	26.2
Yatta Plateau	11,499	316	36.4
Kisau	14,523	91	163.7
Kibauni	14,603	157	93.0
Muthetheni	16,800	60	280.0
Kiteta	9,214	29	317.7
Mbooni	38,011	109	348.7
Kilungu	36,644	95	385.7
Mukaa	27,773	101	275.0
Okia	16,042	71	225.9
Kalama	19,207	69	274.4
Iveti	31,327	42	745.9
Muvuti	15,398	44	350.0
Mitaaboni	32,369	62	522.1
Masii	17,060	66	258.5
Wamunyu	20,291	74	274.5
Makueni	20,191	167	120.9
Nzawi	23,895	193	123.8
Mbitini	19,163	77	248.9
Kikumbulyu	16,259)		
Extra-Locational	2,006)	1,160	17.7
Crown Land, Emali	2,277)		
Ward 11	4,703	331	14.2
Ward 12	7,591	372	20.4
Ward 13	1,093	68	16.1
Sultan Hamud	272	in Ward 12	-

Table 4.1 (continued)

<u>Location</u>	<u>Total Population</u>	<u>Area in Sq. Miles</u>	<u>Density Per Sq. Mile</u>
Kibwezi	290	Kikumbulyu	-
Makindu T.C.	103	Kikumbulyu	-
Athi River (Ward 13)	5,510	-	urban
Konza (Ward 12)	180	in Ward 12	-
Machakos	4,353	7	urban
Lower Makueni	-	351	-
Simba Ranch	-	101	-
Game Park	-	883	-
Totals for Machakos District	548,5 790	5,790	94.8 (avg.)

Source: W. T. W. Morgan and N. Manfred Shaffer, Population of Kenya
(Nairobi: Oxford University Press, 1966), p. 21.

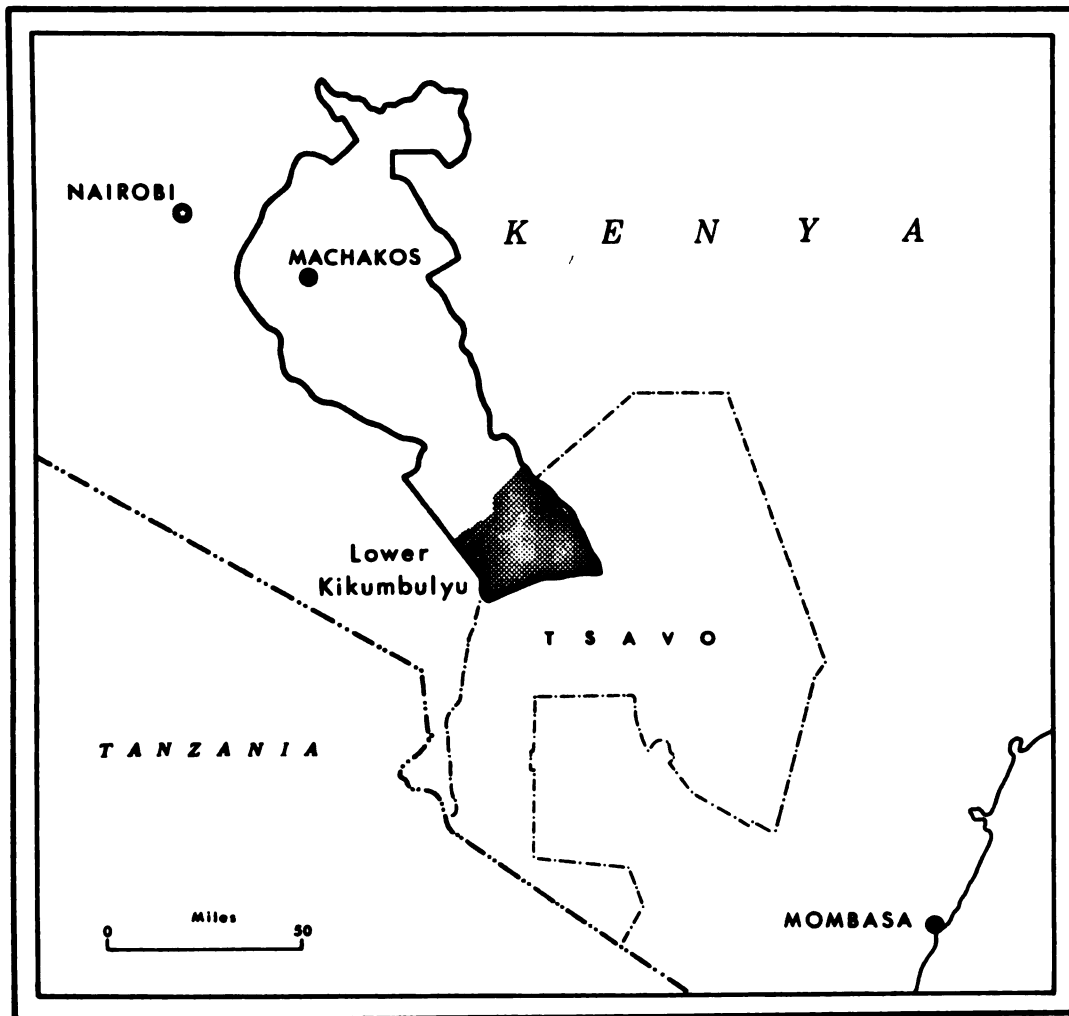
insect vector of trypanosomiasis, a deadly disease of domestic cattle.⁸ With these natural obstacles to human settlement the area has, in the past, been only very sparsely populated.

The Setting

The area of Lower Kikumbulyu that has been subject to recent settlement lies 80 miles southeast of the town of Machakos and is about 750 square miles in area (see Map 4.4). It is bounded on the south and east by Tsavo National Park, on the west by the Chyulu Hills, and on the north by the Kibwezi Forest and the Kibwezi-Kitui road. The area is bisected by the Mombasa-Uganda railway and the Nairobi-Mombasa road (see Map 4.5). Lower Kikumbulyu is the southernmost part of Machakos District and since the elevation declines toward the south and east in the district it is at its lowest in southern Kikumbulyu. Hence Lower Kikumbulyu is analogous to southern Kikumbulyu in common usage.

The land is generally flat, sloping gently from the Chyulu Hills toward the Athi River in the east. The major streams flowing into the Athi: the Mtito Andei, Darajani, Masongaleni, and Kibwezi, have always been intermittent, flowing only during the rainy seasons. Natural vegetation in this subhumid area is dry bushland or thorn-scrub. The dominant vegetation type is *Acacia-Commiphera* bush with scattered larger trees, including *Acacia* spp. and Baobab, and with desert grasses in open areas. Red latosols characteristic of the

⁸This disease is commonly known as nagana in East Africa. Another form of trypanosomiasis, sleeping sickness, is a human disease. Sleeping sickness is also transmitted by tsetse flies but of different species which are not found in this part of Kenya.



Map 4.4

Location of Machakos District and Lower Kikumbulyu
in Southeastern Kenya

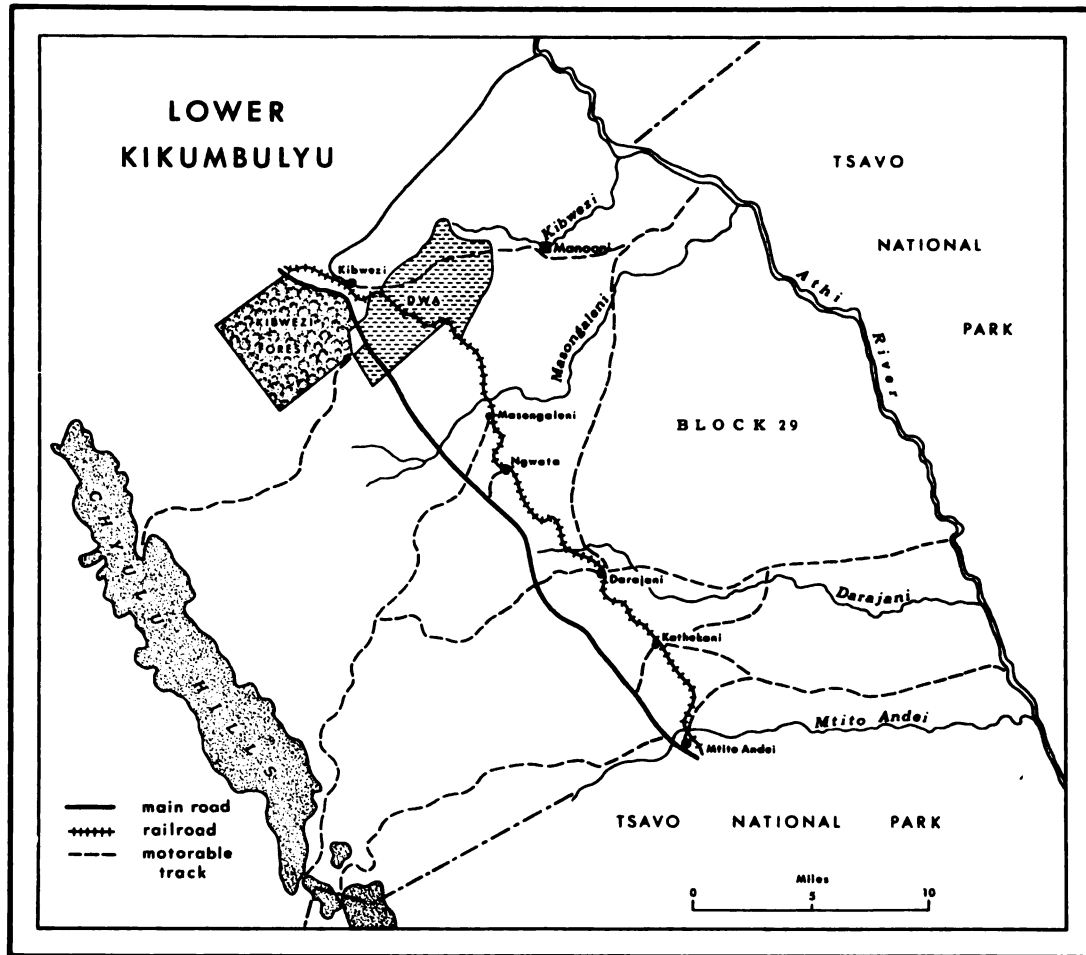
drier parts of Kenya are the most common soil type found in Lower Kikumbulyu.

As was reported earlier, rainfall in this part of Kenya averages only about 20 inches annually and is highly variable. The 20% probability of annual rainfall, the amount likely to be exceeded in four years out of five, lies between 10 and 20 inches, with most of the area falling within the lower part of that range. Periodic droughts have been characteristic in the past, the last severe drought occurring in 1959-60. There are two distinct precipitation maxima, the "long rains" in March-April and the "short rains" in November-December. Much of the rainfall during the short rainy seasons comes in the form of scattered, locally heavy showers. The intensity of these storms produces a high rate of runoff, thus reducing further the amount of moisture available for plant growth. The limited extent of individual storms produces substantial local variation in total rainfall in addition to the pronounced seasonal variability.

The Forces

The southern part of Machakos District has been the scene of migration movements in the past. Historically Kikumbulyu has been occupied by small numbers of Kamba at least since the nineteenth century, and has long been considered part of Ukambani, the Kamba homeland.⁹ As elsewhere in Kenya and in Black Africa in general, records of early population movements are vague, and it is necessary to rely on oral data for a glimpse of the demographic past. According to one of the several Kamba traditions relating to their origin and early

⁹G. Lindblom, op. cit., p. 17.



Map 4.5
Lower Kikumbulyu

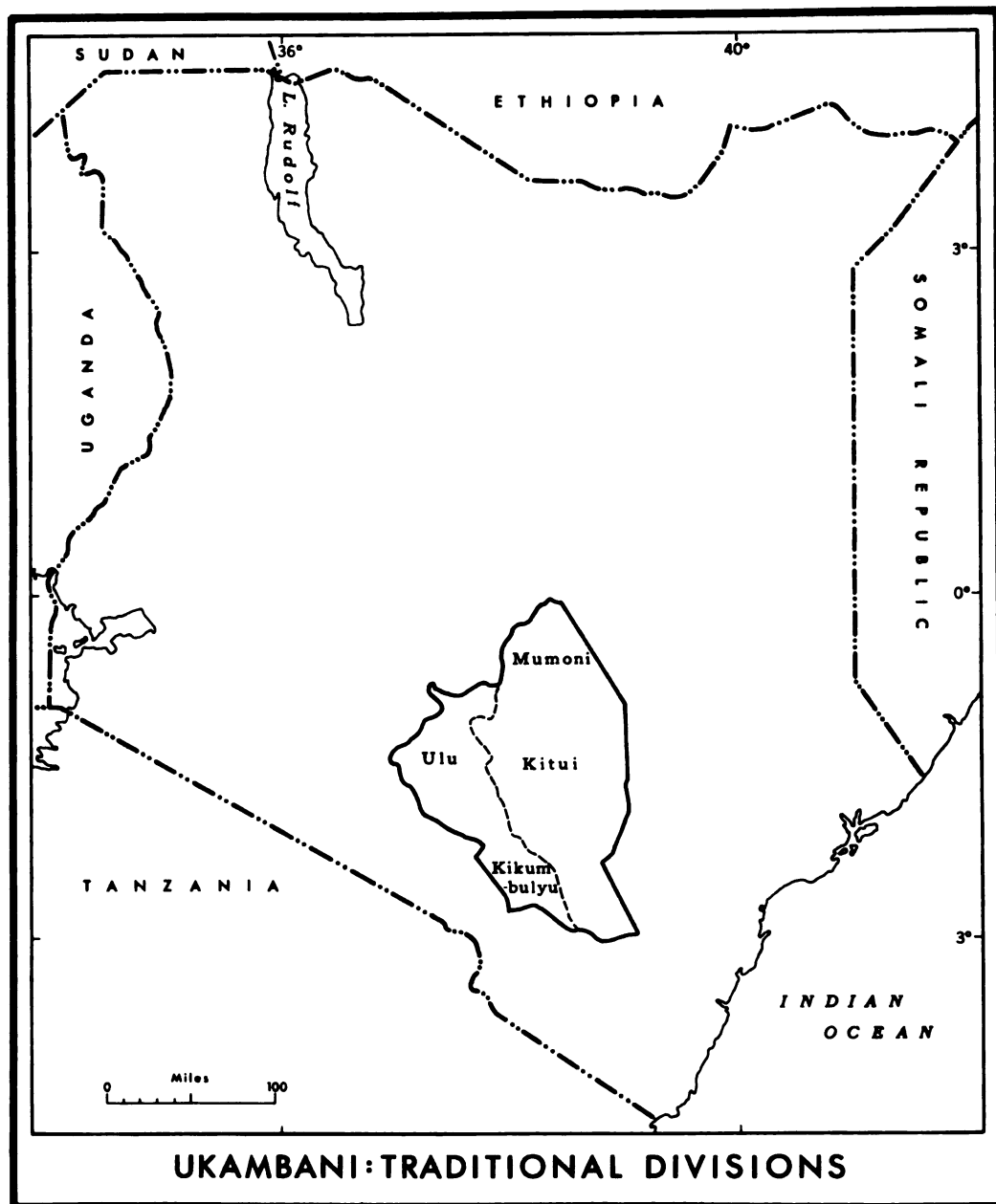
migrations the tribe occupied, at least temporarily, land in the vicinity of the Chyulu Hills prior to their eventual settlement in Ulu, on the Mbooni Range.¹⁰ Whether or not this account of an earlier presence is historically accurate it is certain that by the late nineteenth or early twentieth century Kikumbulyu was recognized as one of the four main centers of Kamba population,¹¹ the others being Ulu, Kitui, and Mumoni (see Map 4.6).

Traditionally the population of Kikumbulyu has been concentrated in the northern part of the location, between Kibwezi and Kiboko. South of Kibwezi, in Lower Kikumbulyu, small numbers of Kamba had settled near the railway towns and there were a few farms scattered near the railway line and the Chyulu Hills. Near the base of the Chyulu Hills were several small settlements of farmers who occupied that better-watered area. The total number of people involved in these settlements was quite small, however, and the population of Lower Kikumbulyu has probably never in the past exceeded a few thousand people.

For various reasons successive Kenya administrations have made attempts to remove the Kamba people from Lower Kikumbulyu and settle them in other parts of Machakos District. Among the reasons for these attempts were: (1) administrative consolidation, (2) the area's marginal character for agriculture, (3) the scarcity of permanent water

¹⁰H. E. Lambert, "Land Tenure Among the Akamba," African Studies Vol. VI (September, 1947), No. 3, p. 133; and The Systems of Land Tenure in the Kikuyu Land Unit, Communications, School of African Studies, No. 22, Capetown, 1950, p. 28.

¹¹G. Lindblom, loc. cit.



Map 4.6

Ukambani: Traditional Divisions

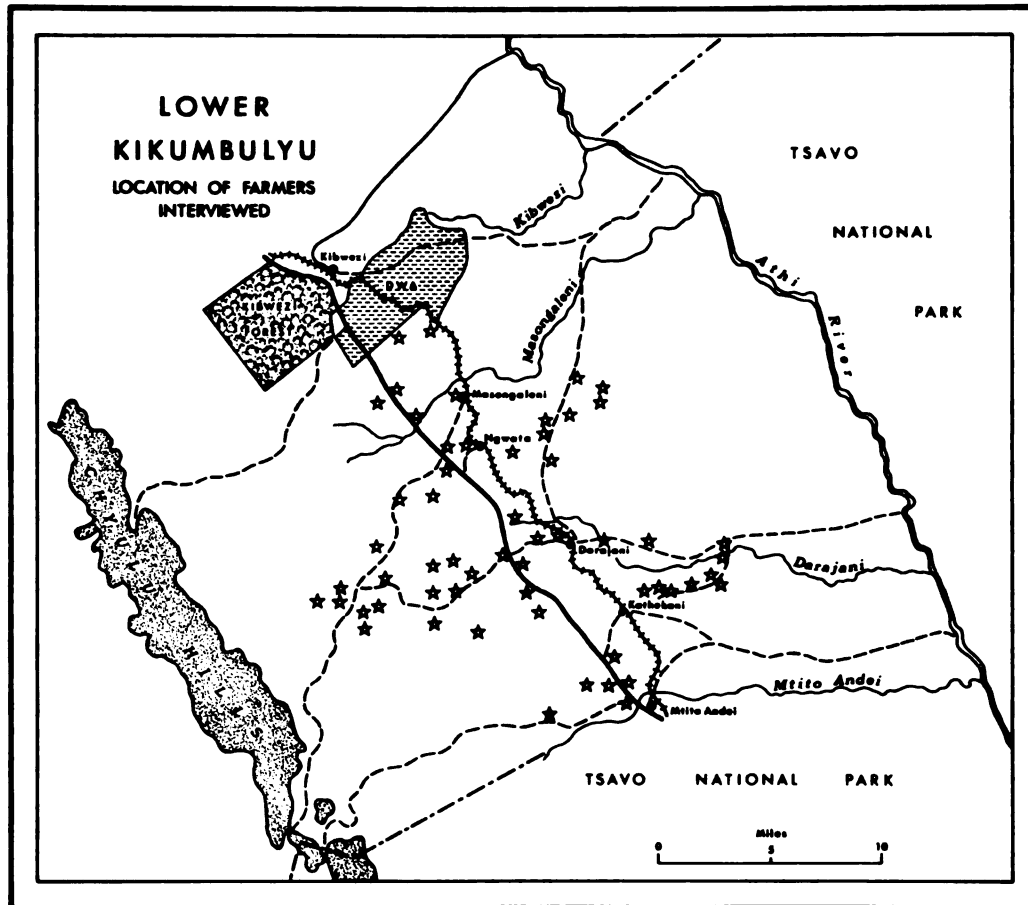
supplies, and more recently (4) protection of the Chyulu Hills catchment area, the major source of Mombasa's water supply. The first such effort, in 1936, was recommended by the Carter Commission. At that time (the early 1930's), the commission estimated the population of the area as 3,194 persons. The recommendation that these people be removed and the area excised from the Machakos Reserve was based on two arguments: (1) the inhospitable nature of the country, and (2)

. . . that the proposal would have the effect of concentrating all Kamba north of the railway line, thus consolidating the Machakos Reserve and facilitating the administration of the tribe and the provision of roads and social service centres.¹²

This attempt was largely unsuccessful, as have been subsequent efforts by both the Colonial and African Kenya governments to relocate the people of lower Kikumbulyu. Some reduction in population was undoubtedly accomplished by these government efforts but Kamba settlement in the area persisted, especially near the railway line and on the lower slopes of the Chyulu Hills, until the mid-1960's when the recent immigration began.¹³

¹²Kenya Land Commission, 1932, Report (Nairobi: Government Printer, 1933), Vol. 2, pp. 217-18.

¹³Data on recent immigration and settlement in Lower Kikumbulyu were gathered during two periods of field research in 1969. Ground and aerial surveys of the settled area were conducted during April and May, 1969. A survey of farmers was carried out in Lower Kikumbulyu in June and July, 1969. A total of 342 farmers were questioned as to their previous residence and 60 farmers were interviewed at length, on details of migration, the operation of their farms, and other economic activities. The form used for these interviews is reproduced in Appendix IX. Interviews of local officials and others with long acquaintance with the area were also conducted in Kikumbulyu, Machakos, and Nairobi. The location of farmers who were interviewed at length is shown on Map 4.7.



Map 4.7

Lower Kikumbulyu: Location of Farmers Interviewed

Star symbols indicate the location of the farm of each farmer interviewed at length during a survey conducted in June and July, 1969. See page 122, footnote 13, and Appendix IX.

The ineffectiveness of relocation attempts since 1936 may be traced to three factors: (1) the settler's attachment to his land, (2) the unsatisfactory (in his view) alternatives offered by the government, and (3) the inability of government to prevent settlers from returning to their old homesteads after removing them. Besides the normal attachment of a peasant farmer to the land he has long cultivated there were, in Lower Kikumbulyu, several attractions that made other, alternative areas of settlement seem unattractive to the Kamba. Unlike most of Ukambani, where overpopulation of men and animals has practically denuded much of the landscape, Lower Kikumbulyu was virtually untouched bushland where firewood and wild game were plentiful and honey could easily be gathered. The availability of firewood has become a serious problem in the more densely settled parts of Machakos District; women sometimes find it necessary to walk many miles in search of a small load of wood. Game animals have been virtually eliminated from most of Machakos District and the Kamba's traditional reliance on game meat as an important part of their diet is no longer possible in these areas. The Kamba were traditionally regarded as great hunters and in the few places where hunting is still possible they continue to hunt for meat and to a lesser extent for trophies such as ivory and rhino horn. Such hunting requires hunting licenses, which the Kamba cannot afford to buy. It is done illegally, therefore, and it is difficult to gather information about the practice. There is no doubt, however, that the Kamba of Lower Kikumbulyu have in the past and continue today to do a great deal of hunting. When asked about hunting activity many Kamba will admit that there is much hunting going on, and that although they

themselves do not hunt they know many people who do. Game Department reports confirm that illegal trophy hunting, especially for rhino, has been a continuing enforcement problem in the area.¹⁴

An additional attraction of the Lower Kikumbulyu bush was the ease with which wild honey could be gathered. In contrast to the more densely settled parts of Machakos District where beekeeping was difficult it was relatively simple for a man to place as many hives as he wished in the uninhabited bush of southern Kikumbulyu. Honey is a favorite food of the Kamba as it is of many other East African peoples. The Kamba also make beer from honey and although less commonly brewed it is much preferred to beer made from sugar cane. Honey is obtained by setting out beehives made from hollowed-out logs. The hive is suspended from the branch of a tree and once the bees inhabit the hive honey is collected three or four times a year.¹⁵ Beeculture is, in fact, widely practiced in Lower Kikumbulyu and a great many hives can be seen in the trees by even a casual observer. Several of the older residents of the area were among those interviewed and they all claimed to have many beehives placed throughout the countryside. One man stated that he owned well over a hundred hives and had owned more but had lost them when Tsavo National Park was created, the lost hives having been within the boundaries of the new park.

¹⁴Republic of Kenya, Game Department, File 19/2, Game Warden, Kiboko, Annual Report, 1968.

¹⁵G. Lindblom, op. cit., pp. 494-500, gives a brief summary of Kamba beekeeping. For a more detailed treatment, see J. K. R. Thorp, "African Beekeepers: Notes on the Methods and Customs Relating to the Beeculture of the Akamba Tribe in Kenya Colony," Journal of the East Africa and Uganda Natural History Society, Vol. XVII (1943), pp. 255-73.

Another factor contributing to the inability of successive Kenya governments to permanently remove the settlers has been the lack of policing after each eviction operation. The procedure in these operations has been to use police or troops to raze farms and buildings in the illegally settled areas when repeated requests that the settlers abandon their farms have been ignored. The persistence of the illegal settlers is illustrated by eyewitness accounts of a recent eviction operation. Several witnesses reported seeing women busily at work gathering saplings and other building materials for construction of a new house even as troops were setting fire to the old houses. Settlers who do leave their farms usually do so only temporarily, returning within a few weeks. Prevention of such resettlement would have required the establishment of a permanent policing force in the area - a commitment the government was unwilling or unable to make. The settlers who occupy the Chyulu Hills area today are not, as some suggest, newcomers but the same people who have always occupied that area. Among the settlers interviewed in 1969 were several who insisted that they and their fathers before them had always lived at Chyulu and they told long, and often amusing, stories of how they hid in the bush until the soldiers were gone and then rebuilt their farms. Other residents of Lower Kikumbulyu confirm these claims and they all seem to have vivid recollections of resettlement attempts by government forces going back to the Carter Commission in 1936. One cannot help but be impressed by the tenaciousness of these Kamba farmers who have, for two generations, been repeatedly burned out, forcibly evicted, fined and sometimes jailed but have stubbornly refused to be driven from what they regard as their ancestral homes.

The Course of Settlement

Prior to 1964 settlement in Lower Kikumbulyu was confined to a small farming colony on the lower slopes of the Chyulu Hills that had long defied government attempts to relocate them and to small areas near the railway stations and plantations. Settlements at the Dwa sisal planation and Manooni sugar plantation were made up entirely of plantation workers and their families who were permitted to farm small plots near the estates. Railway workers were the core of the railway station settlements but there were, in addition, some other settlers who were probably drawn to the area of the stations by the availability of water from the station wells. In 1964, however, new immigrants began to settle in Lower Kikumbulyu and have continued to arrive in increasing numbers over the last five years.

Four factors account for the sudden influx of settlers into an area that was previously very sparsely populated and was considered by most government officials and agricultural experts to be unsuitable for agricultural settlement. The factors that appear to have made Lower Kikumbulyu more attractive for settlement were:

- (1) an initial increase in the supply of permanent water
- (2) a prolonged period of above average rainfall
- (3) improvement of the Nairobi-Mombasa road, greatly increasing the effectiveness of the road as an artery
- (4) the officially sanctioned establishment of a small settlement scheme.

Water Supply and Rainfall

Permanent sources of water did not exist between the Chyulu Hills and the Athi River prior to 1961 except for the supplies of the railway stations and plantations. Heavy rains broke the severe

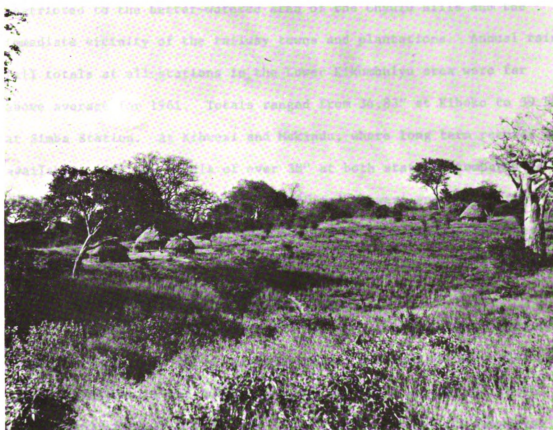


Figure 4.1 A typical Kamba homestead in the newly settled area of Lower Kikumbulyu. This farm, just east of the Nairobi-Mombasa road, was settled in 1966.

drought of 1959-60 and filled the streams, and they have continued to carry water throughout each year since that time. New springs appeared in some places and many water holes, previously seasonal, have held water for most of each year since 1961. With the increased supply of water throughout Lower Kikumbulyu, settlement was no longer restricted to the better-watered area of the Chyulu Hills and the immediate vicinity of the railway towns and plantations. Annual rainfall totals at all stations in the Lower Kikumbulyu area were far above average for 1961. Totals ranged from 34.83" at Kiboko to 39.53" at Simba Station. At Kibwezi and Makindu, where long term records are available, 1961 saw totals of over 38" at both stations compared to 30-year averages for 1931-60 of 23.92" for Kibwezi and 20.12" for Makindu. From 1961 to 1964, when the influx of Kamba migrants began, annual rainfall averaged 33.86" at Kibwezi, an increase of 9.94" or 41% in the annual average (see Table 4.2).

The abnormally high rainfall in the Lower Kikumbulyu area continued through the 1960's. At both Kibwezi and Makindu only 1965 was substantially below the 30-year average in annual rainfall. Three years, 1962, 1966, and 1969 were close to average and all remaining years, 1961, 1963, 1964, 1967, and 1968 were above the 30-year average. The average for the period 1961-69 was over 30" at both stations, an increase of 49% for Makindu and 28% for Kibwezi above the 30-year average at each station.

The Road

The improvement of the Nairobi-Mombasa road was important in two ways: first, it improved access into Lower Kikumbulyu from the northern parts of Machakos District, and secondly it improved egress

Table 4.2
ANNUAL RAINFALL FOR SELECTED STATIONS IN THE KIKUMBULYU AREA OF SOUTHEASTERN KENYA

	<u>Yrs.</u>	<u>Avg.</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>
Makindu	(66)	24.92	16.18	38.51	23.21	41.86	27.43	15.37
Kibwezi, Dwa	(51)	26.19	14.72	38.41	24.60	34.20	38.23	15.02
Simba Station	(38)	26.09	25.78	39.53	27.40	43.10	30.80	17.46
Simba, Nguu Hill			23.09	37.82	26.85	33.08	35.25	10.83
Kiboko Camp	(14)	24.25	10.88	34.83	-----	32.07	25.68	14.64
Kabini Hill	(11)	26.43	15.25	36.80	22.75	31.92	27.03	21.59
Mtito Andei T.N.P.	(18)	26.43	22.38	35.75	25.40	27.84	32.77	15.22
Darajani Station	(11)	24.70	-----	-----	-----	29.73	25.14	14.71

Note: The name of each station is followed by the number of years for which records are available and the long term average annual rainfall for that period.

Table 4.2 (continued)

	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Average</u>	
					<u>1961-69</u>	<u>1931-60</u>
Makindu	19.43	32.71	49.85	21.99	30.04	20.12
Kibwezi, Dwa	20.36	33.01	48.58	22.39	30.53	23.92
Simba Station	18.53	45.60	47.96	-----	33.80*	23.92
Simba, Nguu Hill	13.73	-----	-----	-----	-----	-----
Kiboko Camp	-----	35.92	41.15	22.03	-----	-----
Kabini Hill	27.37	30.87	37.73	18.58	28.29	-----
Mtito Andei T.N.P.	20.09	41.30	49.56	18.35	29.55	-----
Darajani Station	12.92	22.23	53.06	21.04	25.55**	-----

* Average for 1961-1968

** Average for 1963-1969.

Sources: East African Meteorological Department, Monthly and Annual Rainfall in Kenya During the Thirty Years 1931 to 1960.

Summary of Rainfall in Kenya, 1960; 1961; 1962; 1963; 1964; 1965; 1966; 1967.
 Rainfall data for 1968 and 1969 were supplied by the East African Meteorological Department from their original records.

from Lower Kikumbulyu to the south and Mombasa. Improvement of the northern section of the road served to increase the visibility of the areas being settled and permitted more rapid diffusion of knowledge about the settlement throughout Machakos District. Kikumbulyu had been a distant location, reachable from the overpopulated core area of the district only by an arduous, day-long journey over dusty, pot-holed murram roads. With the improved road it was brought within easy reach - a comfortable bus ride of several hours. This impact was not fully felt until 1968 when the northern section of the road, from Mtito Andei to Nairobi was completed. The increasing rate of immigration into Lower Kikumbulyu, as evidenced by the rapid expansion of the frontier of settlement after 1968 (see Maps 4.11 and 4.12) was due, at least in part, to improved access into the area from northern Machakos.

Of more immediate importance to the early immigrants was the southern section of the road, from Mtito Andei to Mombasa. When completed in 1966 the new road south from Lower Kikumbulyu provided improved access to Mombasa and its markets, particularly the charcoal market. In addition to large supplies of wood suitable for charcoal-making, the new settlers found a ready market for their charcoal through local buyers interested in supplying the Mombasa market. These buyers, mostly local Kamba, bought the charcoal in Lower Kikumbulyu and shipped it to Mombasa themselves where they sold their shipments to large dealers, many of whom were also Kamba. Charcoal burning provided the early immigrants with a source of cash income to tide them over the difficult period when they were clearing the land and building their houses but harvesting no crops. Charcoal has



Figure 4.2 Recent settlement along the Nairobi-Mombasa road in Lower Kikumbuyu.

continued to provide a significant source of income for the Kikumbulyu settlers and may, even today, be regarded as one of the most important cash crops in the area.

Sanctioned Settlement as a Factor

Settlement schemes have long been a common feature of rural development programs in Africa. They have transformed some parts of the continent into productive farming regions and by resettling farm families have helped to alleviate overpopulation and land pressure in some crowded rural areas. The Gezira scheme in Sudan is one of the oldest and most successful of Africa's settlement schemes but there have been many others, large and small, successful and unsuccessful, undertaken in all parts of Africa.

In Kenya organized settlement in the immediate post-independence period was largely concerned with the redistribution of land in the former Scheduled Areas, particularly what had been the "white highlands." Settlement schemes in the former African Areas were begun much earlier. The colonial government, beginning in 1938, organized twelve schemes of over 5,000 acres each.¹⁶ Most of these schemes were designed to settle surplus population and livestock from overcrowded rural areas. One such scheme was established in Machakos District in 1947 at Makueni (see Map 4.2). The Makueni Settlement Scheme involved bush clearing and allocation of 30-40 acre plots in dry bush country somewhat similar to that in Kikumbulyu. The Makueni scheme has been criticized as a deliberate overstepping of the minimum

¹⁶Republic of Kenya, Development Plan, 1966-1970 (Nairobi: The Government Printer, 1965), pp. 146-47.

limit of rainfall necessary for sustained subsistence cultivation.¹⁷ It is argued that in this low rainfall area subsistence farmers can never be completely self-sustaining and will suffer from food shortages in bad years, necessitating periodic famine relief. In spite of these criticisms other settlement schemes have been attempted in the semi-arid areas of Kenya. One of these was established in Lower Kikumbulyu in 1964.

The increased availability of water that resulted from the abnormally high rainfall in the early 1960's appeared to make agricultural settlement feasible in Lower Kikumbulyu and in 1964 a small settlement scheme was begun at Ngwata. The Ngwata scheme, planned and administered by the Agriculture Department, was never fully implemented and only a small number of people were actually given land in the scheme. Surveying was cancelled, apparently due to lack of funds, in 1965 after 283 fifty-acre plots had been laid out between Masingaleni and Darajani¹⁸ (see Map 4.5). Although limited in area and in the number of people directly involved this embryonic settlement scheme did serve as an important stimulus to migration.

The Ngwata Settlement Scheme was intended to provide land for the people who were again being removed from the Chyulu Hills by the government in an effort to protect the Chyulu catchment area. In fact, most of the Chyulu farmers returned to the Hills after a short

¹⁷Leslie H. Brown, "An Assessment of Some Development Schemes in Africa in the Light of Human Needs and the Environment," Proceedings and Papers, IUCN 9th Technical Meeting, Nairobi, September, 1963 IUCN Publications New Series No. 4, 1964, pp. 284-85.

¹⁸Interview with the Chief of Kikumbulyu Location, June 5, 1969.



Figure 4.3 The Chyulu Hills, the major catchment area for Mombasa's water supply, seen from the southwest. The western slopes of the Hills are part of a Game Conservation Area but settlement on the eastern slopes has long been a matter of concern to conservationists. National Parks authorities have also expressed interest in the Hills as an addition to Tsavo National Park. If successful in obtaining the Chyulu Hills addition, the National Parks plan to build at least one game lodge in the Hills.

time and most of the plots were taken by people from other parts of Kikimbulyu, especially from the area between Kibwezi and Makindu. These immigrants from northern Kikumbulyu were motivated by the desire for a large piece of land; fifty acres represents an enormous land holding to most Kamba. They expected that they would receive legal title to the land they acquired even though many of them settled outside the surveyed area of the settlement scheme. Even as the plots were being surveyed people began migrating from the northern part of the location to settle in the Masongaleni-Darajani area, anticipating that they would be allotted the land they occupied when it was eventually surveyed. An additional motive for the migration was the feeling of many of the migrants that if they, the people of Kikumbulyu, did not settle the land it might be taken by outsiders, such as Kamba from other parts of Machakos District. This latter motive suggests another factor to be taken into account in the study of migration patterns: the confirmation of ancestral tribal occupance, or in this case, sub-tribal or group occupance.

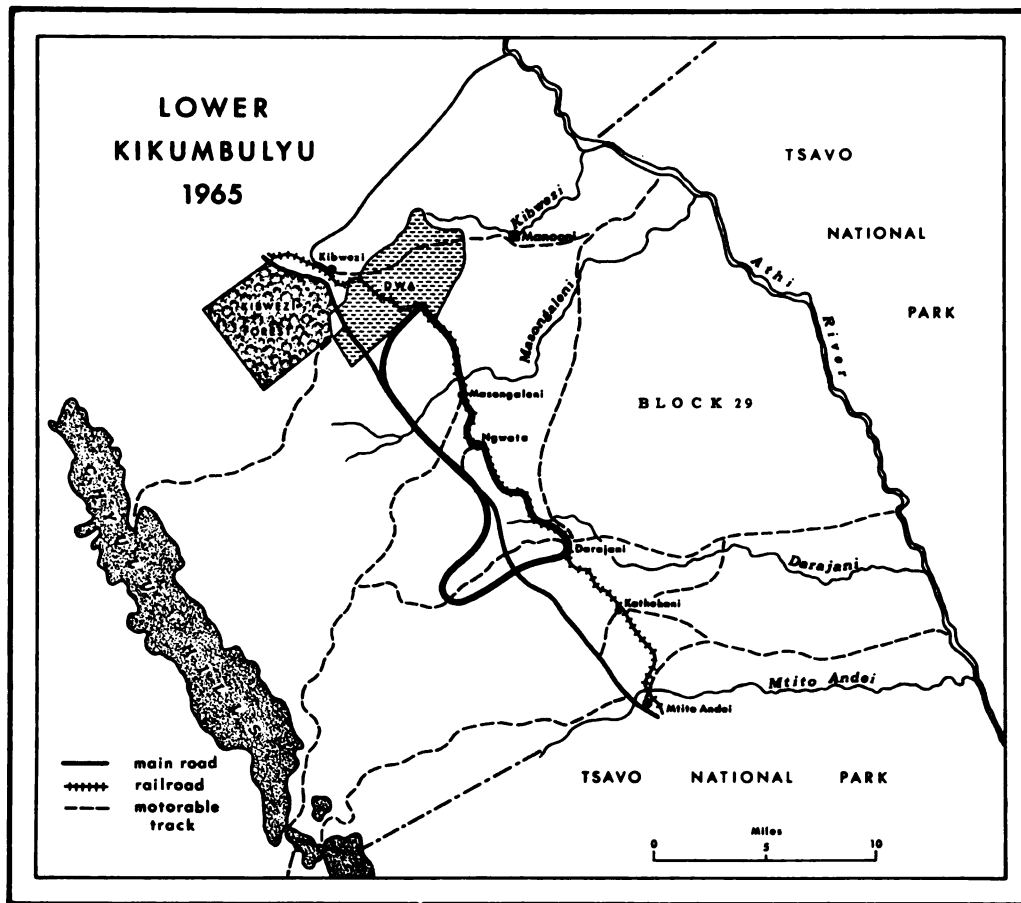
The Ngwata Settlement Scheme formed the core around which further settlement developed in Lower Kikumbulyu. The scheme was successful in attracting settlers in spite of the fact that few services were provided for the immigrants and no administrative structure organized to manage the scheme. Settlement appears to have been haphazard from the start. Many people settled on unsurveyed land as migrants rushed in to obtain land in the area. Although no formal declaration of the precise area open for settlement appears to have been made it was soon assumed that all the land between the road and the railroad was open to settlers. This area from the boundary of

Dwa plantation to the National Park came to be called the "legal area," implying that settlement there was legal. The area to the west of the road toward the Chyulu Hills and that east of the railway was called the "illegal area." As time went on some settlers began to move into the "illegal areas," first across the road toward the Chyulu Hills and later across the railroad into Block 29, in the hope that these areas too would ultimately be declared legal for settlement.

The early success of the Ngwata scheme in attracting settlers was due, in part, to the scheme's proximity to the long-settled areas of northern Kikumbulyu. Most of the early settlers came from nearby parts of Kikumbulyu and were able to clear land and build houses in the new area while still retaining their old farms. Thus they were not dependent upon their new land for subsistence and assumed little risk in the process of migration to Ngwata. Many of the people who came from nearby areas have since sold or abandoned their old farms but some continue to retain an interest in their former holdings. A few even continue to operate two farms and travel back and forth periodically.

After the first influx of settlers from northern Kikumbulyu immigration and settlement continued despite the fact that some of the land was never surveyed and only a portion of the surveyed land adjudicated and legal title granted. By the end of 1965 (see Map 4.8) settlement had reached the boundary of Dwa plantation in the north and Darajani in the south. At this time the settlement was still confined to the area between the road and the railroad, except for a few farms west of the road near Darajani in the south.

Word that land was available for settlement in Lower



Map 4.8

Lower Kikumbulyu: Settled Area, 1965

The heavy line represents the frontier of settlement at the end of 1965.

Kikumbulyu spread rapidly and settlers began to arrive also from the northern parts of Machakos District. They came in greatest numbers from the locations of Mukaa, Kalama, Mbitini, Nzawi, Kilungu, and Iveti (see Map 4.2). Some settlers did migrate from other locations in Machakos District and a few have even come from outside the district, including a small number of Kikuyu, some Taita, and a few Luo (see Appendix XI). The six Machakos locations listed above provided the overwhelming majority of settlers, however, from outside Kikumbulyu. These locations are among those in Machakos District in which local relief, declining soil fertility, and highly fragmented and uneconomically small land holdings combine with rapidly increasing population to produce overpopulation and severe land pressure (see Table 4.2 and Map 4.3). There are, however, other locations in Machakos where similar conditions exist without such attendant out-migration, suggesting that other factors played a role in the high incidence of migration to Kikumbulyu from these particular locations.

The six locations producing the largest number of immigrants to Kikumbulyu range in distance between 30 and 80 miles. Nzawi, the closest, is just 30 miles from Kibwezi and Iveti, the farthest, is 80 miles from Kibwezi (see Map 4.2). There appears to be no consistent relationship between distance from Kikumbulyu and the timing of settlement; among the earliest settlers to arrive were large numbers from Mukaa and Kalama, and among those who migrated later were many from Nzawi, the closest location. The relative location of the six locations is such that they all lie on the western side of Machakos District within close proximity of the Nairobi-Mombasa road. None of the six locations is more than ten miles from the road and three,

Mukaa, Mbitini, and Nzawi, border on the road (see Map 4.2). It would appear that ease of access to the Nairobi-Mombasa road has been a significant factor in promoting immigration into Kikumbulyu from these areas.

"Push" Factors

The movement of Kamba farmers into Lower Kikumbulyu involves "push" factors operating in the source locations as well as the "pull" factors elaborated above. The most important "push" factor in Machakos District is undoubtedly rural poverty, resulting from overpopulation and land pressure. Large numbers of Machakos Kamba either have no land at all to cultivate or own a holding so small that it cannot provide an adequate subsistence. Emigration from the district has been the response of many "landless" Kamba farmers and has served as a safety valve partially alleviating land pressure in Machakos. The emigration rate¹⁹ for the Kamba in 1948 was 9.4% with the rate for Kamba males at 12.9%.²⁰ By 1962, when the next census was taken, the Kamba emigration rate had increased to 12.4% and that of males only to 15.6%.²¹ There were, in 1962, 115,858 Kamba living outside the home districts out of a total Kamba population of 933,219.²²

¹⁹The emigration rate has been calculated by subtracting the number of persons enumerated in the census as Kamba, in the traditional home districts of Machakos and Kitui, from the Kamba total for Kenya as a whole. The resulting figure (the number of Kamba residents outside the home areas) is then expressed as a percentage of the tribal total.

²⁰A. W. Southall, op. cit., p. 169.

²¹S. H. Ominde, op. cit., p. 136.

²²Kenya, Ministry of Economic Planning and Development, Kenya Population Census, 1962, Vol. III, African Population, Nairobi, 1966, p. 36.

Some of these Kamba emigrants have been drawn to the major urban areas, particularly Nairobi, but there are substantial numbers also in Central Province and the Coast Province.²³ In the Coast Province a large number are within the Shimba Hills Settlement Scheme in Kwale District.

There has also been a substantial amount of migration within the Kamba home districts which is not, of course, reflected in the emigration rate. Kamba farmers have been moving into the less densely settled parts of Machakos and Kitui Districts for many years in response to population pressure.²⁴ The settlement of Makueni Location is one such instance and the more recent movement into Lower Kikumbulyu is another. That landlessness is the major impetus to this movement is best illustrated by the Kikumbulyu migrants' own descriptions of their reasons for migration.²⁵

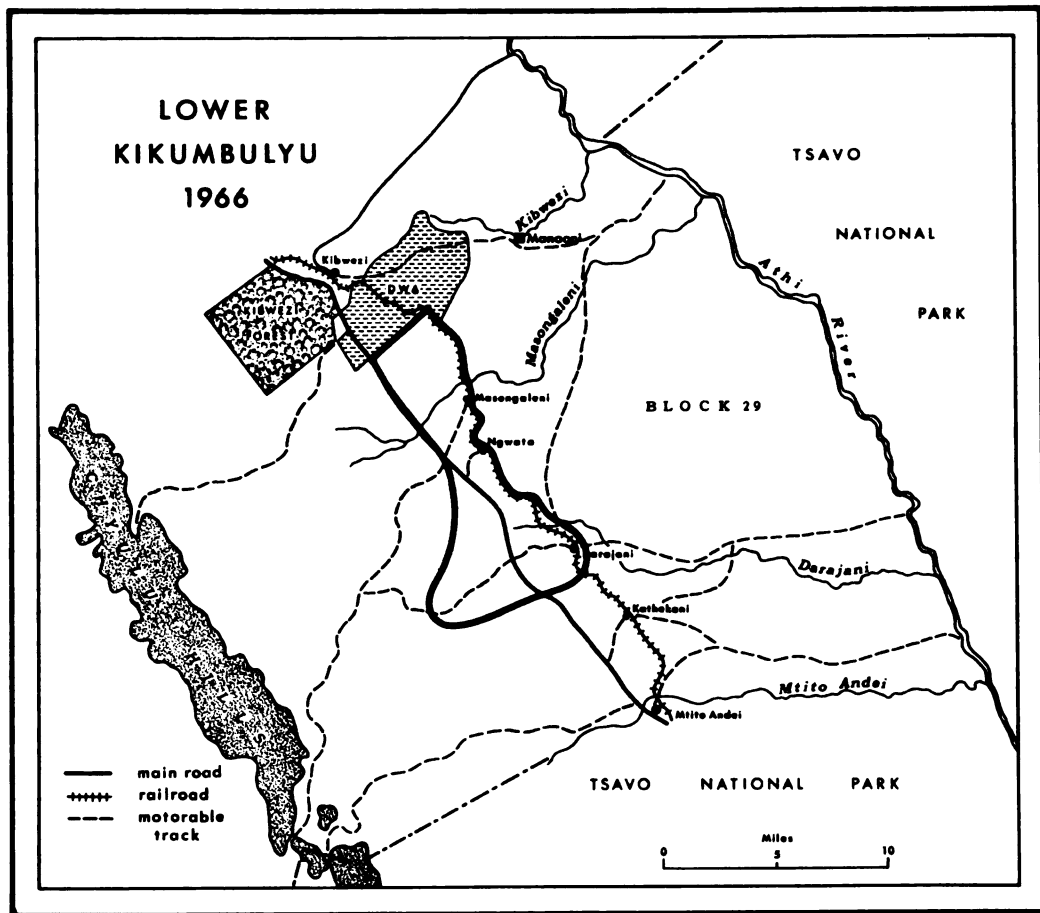
When asked why they had left their home locations and migrated to Lower Kikumbulyu most of the new settlers told similar stories of being unable to support their families because they owned no land or the land they owned was too poor or too small to provide the food they required. A man from Iveti who had come to the new settlement in 1968 told how his family was always hungry there because the land they cultivated was just a small strip on the slopes of Iveti Hill,

²³Ibid., p. 35.

²⁴Above, p. 112.

²⁵The examples of reasons for migrating that follow were collected during a survey of settlers in Lower Kikumbulyu conducted during June and July 1969. Data on previous residence of each farmer and his father and brothers was gathered as well as a statement outlining his reasons for migrating to Kikumbulyu. A copy of the questionnaire used in the survey is included as Appendix IX.

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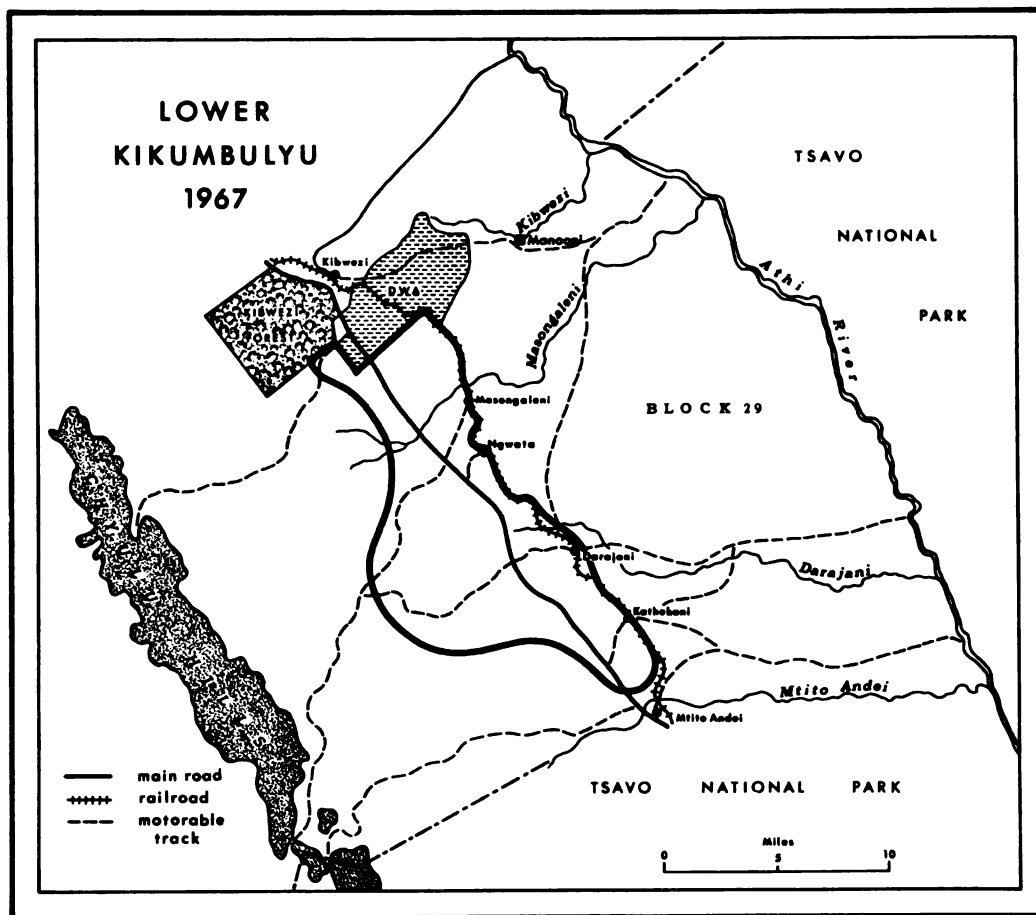
Map 4.9

Lower Kikumbulyu: Settled Area, 1966

between the rocks. This man had three brothers; one had settled about a mile away and the other two were still in Iveti with his father. He thought that they too might soon move to Kikumbulyu. Another man, who had just arrived in a group of six people migrating together from Kilungu, told a similar story of owning a small, rocky strip of land. The land was so poor, he said, that he had never harvested food from his farm but always ate the crop in the fields because they were so hungry. To support his family he worked as a casual laborer. The piece of land was so small, he went on, that when he sat in his house talking in a low voice, his neighbors on both sides could hear him.

Among a group of immigrants from Mukaa who had settled in Block 29 in April 1969 was a man who told how his father's land had been divided among seven brothers, each of the resulting pieces too small to produce an adequate subsistence. A woman in the same group was divorced from her husband and had returned to her father's home with her two children. She found, however, that there was no land there for her to cultivate, so when she heard of land being settled in Lower Kikumbulyu she joined the group in hopes of obtaining land. Others in this group of five people related similar circumstances as their reasons for migrating.

Another indication of the intense pressure behind the migration is the determination of the immigrants to stay in Kikumbulyu regardless of the difficulties they might face. The new settlers were asked in the survey what they would do in case of drought and successive crop failures, and where they would go if they were forced to leave their new farms. The Kikumbulyu immigrants were nearly unanimous in proclaiming that they could not consider abandoning their new



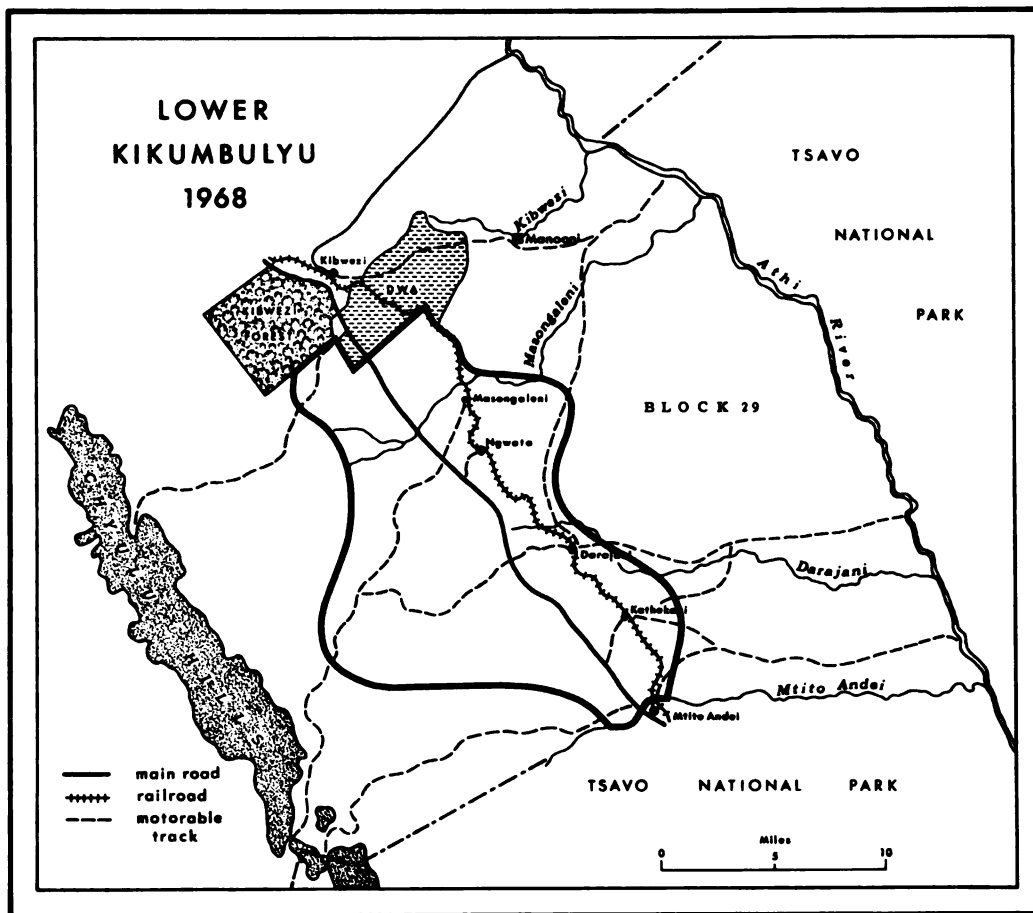
Map 4.10

Lower Kikumbulyu: Settled Area, 1967

land, as they had no place else to go. A woman from Iveti said that if the rains failed and there was famine she would "eat the fruits of the baobob tree" and when there was no life left she would simply die. A man who had come to the new settlement from Nzawi because he could not find enough grazing for his cattle there expressed the same kind of resolve. He said that if there was a drought and his cattle died he would simply wait to die. Another man, from Kalama, was asked where he would go if forced to leave Kikimbulyu. He must stay, he said, for he had been all over Ukambani looking for land and there was nowhere else to go.

The intensity of the "push" factors operating in the northern parts of Machakos District combined with the pull of availability of land in the south and increased accessibility into the area produced a growing migration stream from north to south. Pushed from their home locations by overpopulation and land pressure, increasing numbers of Kamba settlers poured into Lower Kikumbulyu and the new settlement grew rapidly.

By the end of 1966 the area between Dwa and Darajani was beginning to become crowded and the frontier of settlement continued to expand slowly southward. More settlers also began to move across the road to the west, into the "illegal area," along the Darajani-Ngwata section of the road (see Map 4.9). The advancing frontier of settlement was approaching the southern limit at Mtito Andei, where the National Park boundary precludes further southward settlement, by the end of 1967 (see Map 4.10). Expansion also continued to the west, generally following the tracks that led to the Chyulu Hills. The tracks in this area had long served to link the Chyulu settlements



Map 4.11

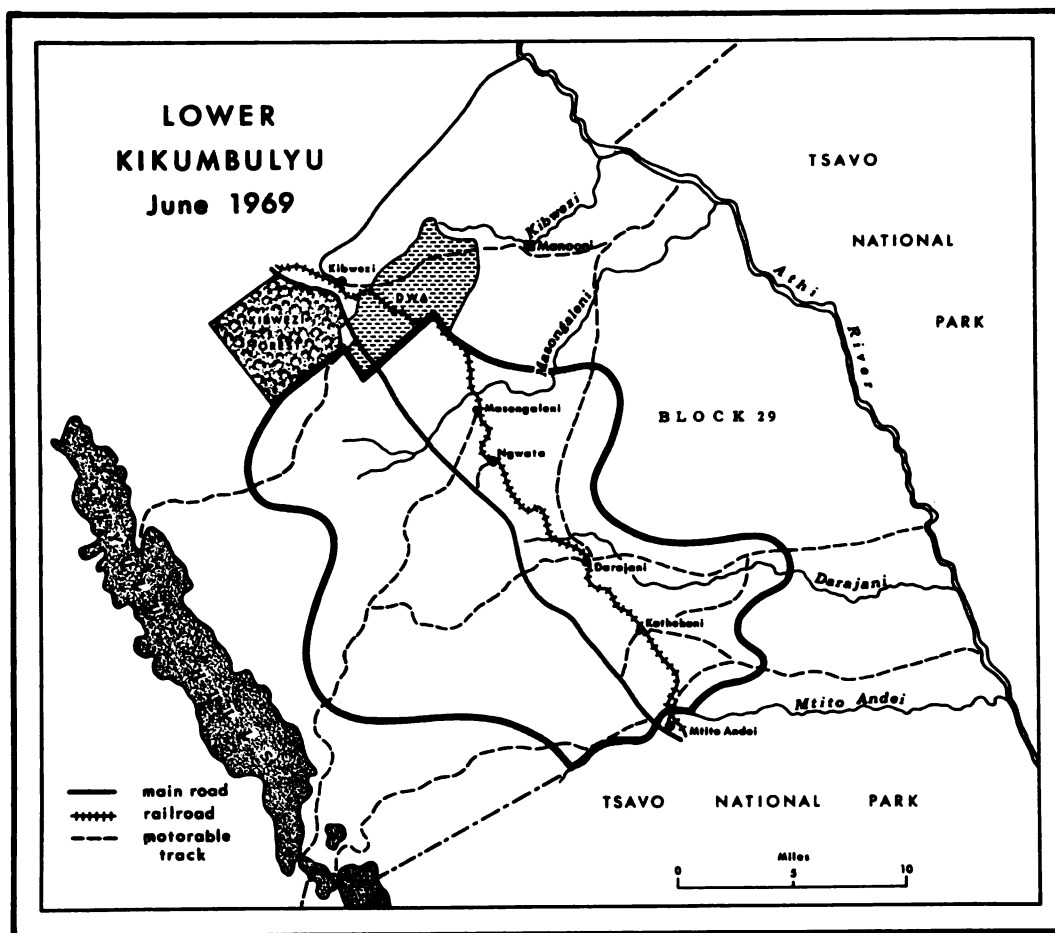
Lower Kikumbulyu: Settled Area, 1968

with the towns along the railway. These pathways of a foot-carried exchange economy now served as avenues of migration, along which the new settlers moved deep into the bush toward the Hills. By mid-1968 virtually no land remained available for settlement between the road and the railroad. With the area to the west of the road also filling up, movement to the east, across the railroad, had begun by the end of 1968 (see Map 4.11). The extremely dense bush in this area resulted in settlement closely following the streams and existing tracks. In Block 29, the area east of the railway, most of the tracks had been developed by professional hunters who used the block regularly for hunting parties, particularly when in search of elephant and rhinoceros. By the middle of 1969 the frontier of settlement in Block 29 had advanced along the Daranjani half way to the Athi River and in the west settlers had come to within a few miles of the Chyulu Hills (see Map 4.12).

Social Organization and Group Migration in Ukambani

The recent movement of Kamba pioneers into the sparsely settled bushland of Lower Kikumbulyu may be viewed as the contemporary manifestation of a long, historic process of Kamba expansion from the overcrowded locations of northern Machakos. This downslope movement from crowded hill settlements has become a common feature of population mobility in Africa, particularly since the late 19th century when colonial administration brought improved security to large areas of the continent.²⁶ Kamba downhill movement apparently began before

²⁶R. M. Prothero, "Migration in Tropical Africa," The Population of Tropical Africa, ed. J. C. Caldwell and C. Okonjo (New York: Columbia University Press, 1968), p. 252. See also M. B. Gleave, "Hill Settlements and Their Abandonment in Tropical Africa,"



Map 4.12

Lower Kikumbulyu: Settled Area, June 1969

the advent of colonial rule in Kenya²⁷ and has continued into the present day. A brief look at several aspects of traditional Kamba social organization and the process of migration by which they expanded aids in understanding contemporary Kamba population movements.

Traditional Kamba Social Organization

The Machakos Kamba divide themselves into a number of large patrilineal clans. These patrilans (mbai) are today widely scattered throughout Ukambani and kinship groups in any one contiguous area are usually represented by extended families of only a few generations. There is evidence, however, that in the original Kamba settlements on the Mbooni range the patrilans were territorially distinct.²⁸ The high degree of mbai scattering evident in Ukambani today is a result of the traditional mode of migration and settlement.

The Utui System. As population pressure increased in the original hill settlements, individuals and groups of individuals began to emigrate from the old settlements and move into previously uninhabited land. These early pioneers grouped themselves together for mutual aid and security. The people who grouped together in the new

Transactions of the Institute of British Geographers (London), Vol. XL (1966), pp. 39-49; and by the same author, "Hill Settlements and Their Abandonment in Western Yorubaland," Africa, Vol. XXXIII (1963), pp. 343-52; and "The Changing Frontiers of Settlement in the Uplands of Northern Nigeria," Nigerian Geographical Journal, Vol. VIII (1965), pp. 127-41.

²⁷J. Middleton and G. Kershaw, loc. cit.
G. Lindblom, loc. cit.

²⁸H. E. Lambert, "Land Tenure Among the Akamba," African Studies, Vol. VI, No. 3 (September, 1947), pp. 131-47. This summary of the traditional mode of Kamba expansion relies heavily on Lambert's valuable work which is continued in African Studies, Vol. VI, No. 4 (December, 1947), pp. 157-75.

settlements were of mixed origin and each such settlement usually contained several mbai. Although the settlers retained their loyalty to the patricians, their immediate practical interests depended upon relationships within the new community, much of which was outside the traditional range of kinship. Thus, in the new settlements, the utui, a group of territorially compact homesteads, replaced the kinship group as the most significant social unit in everyday Kamba life. As expansion continued this method of splitting off and resettlement in smaller units gave rise to a pattern of settlement that is still evident in Ukambani. This is the utui system of residence, which is based on territorial proximity rather than on common kinship.

The utui was a self-contained unit; as a kind of miniature tribe it was self-sufficient economically and socially. Being made up of members of several mbai it was possible for a man to find a wife within the utui or at least within a neighboring utui, a situation that is unlikely when kinship groups are territorially compact. Even in recent times much of the self-sufficiency of the utui remained. Each utui was an independent unit with its own men's club, recreation ground, administration, and its own magistrates. In earlier times the utui also had its own standing army and war leaders.

Because the people living in the utui were of mixed mbai the community lacked the natural bonds of kinship that would require mutual assistance and enforce socially acceptable behavior. To substitute for the missing kinship ties a new social bond was created to regulate behavior and ensure social order within the utui. This new bond was forged by means of a social oath. Each new resident of the community was required to swear the utui oath before he could be

accepted as a member of the group. This oath applied only to a particular utui and had no force outside of that community. The strictly local nature of the oath is revealed by the fact that when a man moved into a new utui he had to swear the utui oath regardless of how many utui oaths he had sworn in other communities.

The utui elders had the power to deny residence in their community to any person they did not feel would be an acceptable member of the utui. Any man with a reputation for anti-social behavior would be considered undesirable and customarily excluded. The elders' ability to regulate settlement lay in their power to refuse to administer the utui oath or accept the customary fee, "the goat of the stockade" (mbui ya mathanzu), paid by every adult male immigrant to the community.

In present-day Ukambani the utui may no longer exercise its former politico-territorial role but the social role of the neighborhood group survives and influences the contemporary migration field. The importance of the ties of neighborhood may be seen in the characteristics of the Kikumbulyu-Machakos information field, the context of migration decision making, and in grouping behavior in both the migration and settlement.

Group Migration

Information Flow. The flow of information into northern Machakos about the opportunities in Kikumbulyu is largely channeled through neighborhood groups. Typically, a man first learns of the availability of land in Kikumbulyu from a friend or neighbor who has returned to his home location after seeing the new settlement, or perhaps after actually obtaining a piece of land. Most of the new

settlers interviewed had made several trips to Kikumbulyu before embarking on their final migration. In this way a steady flow of information about settlement opportunities in Lower Kikumbulyu is established. It is within the neighborhood group in the home location that the information circulates after being introduced by eyewitnesses returning from Kikumbulyu. It is also within the neighborhood group that the decision-making process is most often carried out.

Group Decision Making. Although some men do migrate individually after having, apparently, arrived at the decision to migrate without lengthy consultation with other people, group decision-making is common. The possibility of migrating to the new settlement is often discussed by groups of neighbors and friends. These discussions may be lengthy, stretching over a period of weeks or months, as the advantages and disadvantages of migration are carefully weighed. Eventually some or all of the group decide that they will travel to Kikumbulyu to try to find land.

The Migration and Settlement. Once the decision to migrate has been made it is common for the new migrants to travel to Kikumbulyu in a group. They usually travel by bus or lorry, although some claim to have walked, and attempt to obtain land in the same area. They usually succeed in obtaining adjoining plots of land and then return to the home location to prepare for the move to their new land. After gathering what possessions they wish to carry with them, they return as a group to Kikumbulyu to begin their new life. The neighborhood group then functions cooperatively, first building one house for all to sleep in while they clear each other's land for

planting and build the rest of the houses. One such group of five people was interviewed in Block 29 in June, 1969. They were all neighbors in Mukaa and had come to begin clearing their new land in April. They explained that they had built the one house because there were many wild animals in the area and they were afraid to be alone and outside at night. By working as a group they expected to be able to have everyone's land cleared and all the houses built in time for planting before the short rains began in late October. This grouping together, in the new settlements, of people from the same home location is further reinforced as other groups and individuals, when looking for land, try to locate near the farms of people from their home area.

Advantages of Group Migration. The advantages of group migration are several. The economic advantages of group settlement are obvious; by working cooperatively the group can shorten the time required to establish their new homesteads and materially reduce the economic risk involved. Working with very little capital, most settlers can afford to buy food for only a few months and must get a crop in their new farms as soon as possible. If they fail to clear and plant during their first season it may be necessary to abandon, at least temporarily, their new land and return home to raise additional capital. A man also knows that the group who helps clear his land will be available to assist him with other agricultural tasks requiring joint effort. Thus the man who migrates with a group knows in advance that he will have the assistance he is likely to need to successfully establish himself in the new settlement. A man can also reduce the social risk of settlement in a new place by group

migration. If he were to migrate alone he might then settle among strangers, people with whom he had no social ties. By migrating with people from his home location he can settle near people he knows and with whom he shares an existing social bond. The man who migrates by himself or in a small group may also attempt to reduce his social risk by settling near other people from his home area who are already established in the new settlement.

Impact of Group Migration. The impact of group migration and the persistence of former social ties can be observed in the spatial pattern of settlement which reveals a pronounced clustering by location of origin. Map 4.13 shows the settled area in mid-1969 subdivided into areas in which migrants from particular locations are the dominant group. These areas are not homogeneous in terms of origin; all contain people from a large number of locations, but each of them has a core population from one of the major locations which dominates the local area. The inhabitants of Lower Kikumbulyu recognize this clustering together and describe certain areas as being made up of people from Iveti or Mukaa, etc. Place names have begun to reflect the origins of the settlers in some areas; one community near Kathekani is called Kalama because most of the people living in the new settlement came from Kalama location.

The "First-footing" Fee. Another interesting link with the traditional Kamba mode of settlement is the apparent survival of the customary "first footing" fee payable by new immigrants into the community. Traditionally this payment was a goat, called "the goat of the stockade" or mbui ya mathanzu. Today the new settlers in Kikumbulyu are required to pay a similar fee in cash. The amount ranges

Lower Kikumbulyu: Settlement by Location of Origin

from 10 to 20 shillings and is variously described as being "for the elders," "to build a school," or sometimes a portion for the elders and the rest for a school. If a man comes for land but does not have the fee he may be shown where he will be allowed to settle but is not permitted to demarcate or begin work on the land until the fee is paid. When new settlers were asked what would happen if they did not pay the fee the answers varied. Some said that they would not be given land, others that the land would be given to someone else, and a few thought that they would be beaten and driven away if they attempted to start clearing the land before paying. There is, of course, no legal necessity that the migrants pay a fee. The land is not in private ownership - it is government land theoretically open to all settlers, although it has never officially been declared open for settlement. To put it another way, all settlement outside the boundaries of the Ngwata Settlement Scheme was, strictly speaking, illegal, and no one had the authority to permit settlement or to charge a fee for so doing. The general willingness of the migrants to pay the fee without complaint suggests that they consider such payments to be proper and in accord with customary practice.

The Persistence of Settlement:

Livelihoods and Prospects

Agriculture.

The Kamba pioneers who came to settle in Lower Kikumbulyu brought with them their traditional agricultural techniques and cropping patterns. As in most of Ukambani maize is the staple subsistence crop and is planted in both seasons. Several legumes common

throughout Machakos District are also grown in the new settlements. Pigeon peas is the most frequently cultivated of these, with cow peas and green grams also fairly common. Some millet and sorghum is grown but these grains appear to be of minor importance. Cassava is planted in small plots by many farmers as a famine crop. Small amounts of bananas and sugar cane are produced where conditions are favorable, most of the crop being sold for cash. Cotton and castor beans are other cash crops that have been tried by some farmers. Cotton has not generally done well in this area but some farmers have had good yields of castor in the better years. Surplus maize and pigeon peas are also sold for cash in good years.

New farms in Kikumbulyu are first cleared of bush; larger trees, too difficult to remove, are left standing. Fields are then burned, the fire consuming the bush cuttings and grass. The fields, when prepared for planting, are irregularly shaped and of varied size. The soil is broken with hand hoes and the seed broadcast sown. There is apparently no attempt to space plants and no evidence of row planting of maize or any other crop was seen in the farms observed. Several instances of near total failure of crops of pigeon peas due to overly close spacing of plants were observed. Interplanting is common, especially of pigeon peas and cow peas with maize in the short rainy season planting. These legumes require the full two rainy seasons to mature and are planted with the short rain maize. When the maize is harvested the legumes are left in the field and are then ready to harvest in July after the long rains. Millet and sorghum are also often interplanted with the short rain maize crop. Acreages and yields are difficult to gauge accurately under these circumstances

but reasonable estimates were obtained from the survey of farmers conducted in June-July, 1969. Farmers were asked what crops they had planted in each season and the yield for each since beginning their farms. The longest record of farm operation went back to 1965 but most of the farms recorded had only been in operation for two or three years. All the farmers interviewed were able to recall the details of cropping in past seasons without difficulty and with apparent precision. Farmers were also asked to point out the fields in which each crop was planted. The size of each field was then estimated by an experienced Agricultural Assistant.

Results of this survey indicate that per season maize yields for the period 1966-69 averaged two and one-half bags²⁹ per acre. The average yeild for the 1968 short rain maize crop was approximately two bags per acre despite exceptionally high rainfall. Total rainfall for 1968 was the highest in over ten years and most stations in southern Machakos recorded double the long-term average yearly rainfall (see Table 4.2). An average yield of 2-2½ bags per acre, then, may represent close to the maximum maize yield obtainable in the area under the present methods of cultivation. It is unlikely that even this rather low average yield can be maintained over any extended period of time with repeated cropping. Declining yields can be anticipated as repeated cropping drains the fertility present in the freshly cleared land. In addition to the gradual decline in fertility that can be expected, the low annual rainfall presents an apparently insurmountable barrier to successful farming in this area.

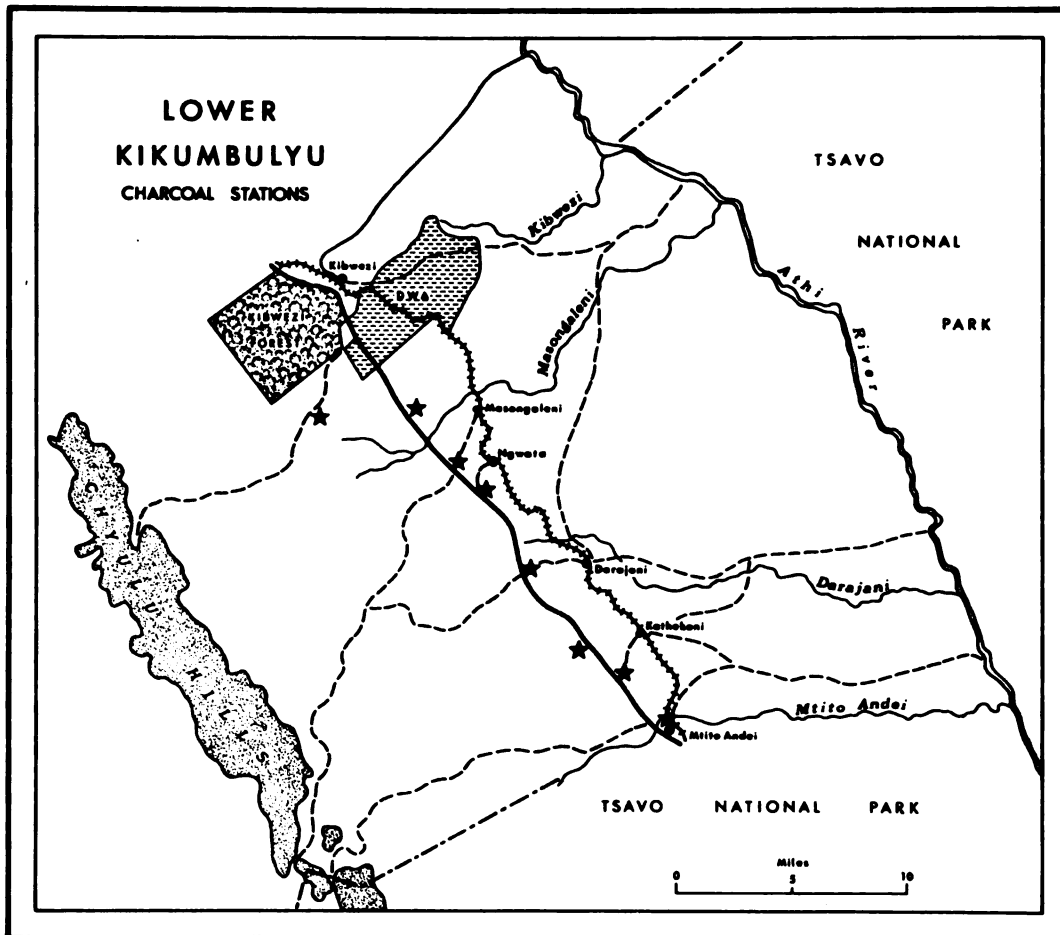
²⁹A bag is equivalent to 200 lbs. of grain.

Except under special circumstances the 30" isohyet of annual rainfall in East Africa is generally considered to mark the boundary of land which can be successfully farmed. In areas with less than 30" total annual rainfall cropping becomes unreliable and permanent cultivation on a sustained basis unfeasible.³⁰ This is particularly true when the rain comes in two distinct seasons rather than in one concentrated rainy season. Only the drought-resistant millets and sorghums are likely to yield reasonably well in these areas, maize being particularly ill-suited to such moisture deficient conditions. Average annual rainfall in Lower Kikumbulyu is closer to 20" than 30", well below the accepted minimum. Variability of rainfall presents another obstacle to farming in dry areas. Droughts are common and have been a feature of the rainfall pattern in southeastern Kenya in the past. Periodic total crop failures are to be expected every several years. Such failures can be disastrous for farmers who have been unable to build up stores of surplus grain because low yields even in good years provide barely enough foodstuffs to meet subsistence requirements. It would appear inevitable, then, that maize-based subsistence agriculture, such as that being practiced by pioneer farmers in Kikumbulyu, cannot succeed on a permanent basis.

Charcoal

Most of the pioneer farms in Lower Kikumbulyu, in fact, have not been self-sufficient and other sources of income have been

³⁰L. H. Brown, op. cit., pp. 280-87, discusses the minimum rainfall necessary for reliable cropping in East Africa and presents examples of the consequences of overstepping the environmental limits.



Map 4.14

Lower Kikumbulyu: Charcoal Stations

essential. The most important source of additional income for the settlers has been charcoal making. From the early days of the settlement, in 1965, large amounts of charcoal have been produced in this area and shipped to the Mombasa market. The intensity of this activity and its importance to the settlers suggests that the opportunity to earn cash through charcoal burning may have been a significant inducement to settlement in this agriculturally sub-marginal area. There can be little doubt that charcoal burning has played a major role in the economic survival of many farmers. When all other subsistence activities fail charcoal provides one certain source of cash for Kikumbulyu farmers.

Organization of the Charcoal Trade. The charcoal trade in Lower Kikumbulyu is organized by licensed charcoal buyers who operate in this area. There were, in mid-1969, twenty-eight charcoal buying licenses in operation between Kibwezi and Mtito Andei. The number of charcoal buyers is probably several times this figure, however, as license sharing, with a number of people buying on the same license, is becoming common, especially among the newer buyers in the southern part of the area. Licenses may be shared by individual buyers who each trade independently or by groups who pool their capital and buy jointly, operating as a company.

The holders of fourteen of these charcoal-trading licenses were interviewed during a survey of charcoal buyers conducted in June, 1969 (see Appendix 10). Eight of the licenses were held by single buyers, two were shared by individual buyers, three were held by single companies of buyers, and one was shared by four companies and one individual. The companies recorded in the survey were made up of

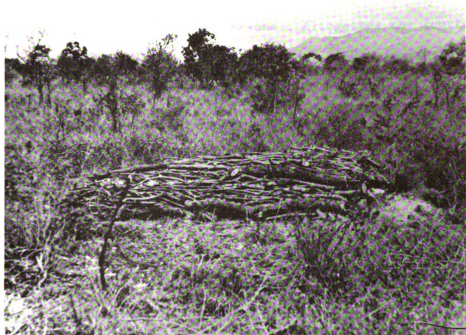


Figure 4.4 Charcoal-making in Lower Kikumbulyu. Cut wood is carefully piled and then covered with dirt before firing.



Figure 4.5 Charcoal pile shortly after firing. Once fired the pile smolders for several days.

from three to seven people but such companies were said by the buyers to range in size from two to ten persons. Altogether the fourteen licenses involved fifty-one people. Sixteen of these were individual buyers operating on a total of eleven licenses and the rest made up the seven companies which traded on four licenses. As the fourteen licenses represents exactly half of the total number of licenses in the area we may estimate that approximately one hundred people are actively engaged in charcoal buying in Lower Kikumbulyu.

The charcoal buyers interviewed reported buying a total of 600 bags of charcoal a week. The largest buyers averaged 70 bags per week while some of the newer buyers handled as little as six or seven bags per week. The total amount of charcoal produced in the area can be estimated at 1,200 bags per week. At an average price paid to the burner of sh.3/50 per bag this represents a total cash income of sh.16,800 a month for the charcoal burners. The importance of this trade is apparent; on a yearly basis charcoal burners in Lower Kikumbulyu earn nearly sh.200,000 from their activity, making it by far the most important cash crop in the area.

The burners are paid on the average 3 to 4 shillings a bag by the charcoal buyers. The price varies seasonally, being highest in the rains when burning is most difficult and demand is greatest. The price paid to the burner also varies depending on whether the charcoal is delivered to the buyer's station (see Map 4.14) or has to be picked up by the buyer. A few buyers will pick up charcoal at the burning site but the price paid is from -/50 to 1/- less than if delivered to the station. Another factor affecting price is whether the buyer pays



Figure 4.6 Bags of charcoal stacked next to the Nairobi-Mombasa road.



Figure 4.7 A more elaborate charcoal station located at the juncture of the Nairobi-Mombasa Road and the road to Masongaleni. From these stations the charcoal is trucked to the Mombasa market by local charcoal buyers.

the burner immediately or not. Many buyers operating with limited capital are unable to pay the burners until they have received payment from the Mombasa dealer they sell to. A few buyers, however, have sufficient capital to pay cash to the burners upon delivery and they are able to obtain their charcoal at sh.-/50 to 1/- less than the price paid by other buyers. Thus the price a burner receives for his charcoal may vary from sh.2/- to sh.5/- depending on season and other factors. The charcoal buyers receive sh.6/- to 7/- a bag from the Mombasa dealers. The buyers must pay sh.1/- per bag for trucking to Mombasa so their net return averages sh.2/- per bag.

Method of Charcoal Making. The procedure used by the Kamba for making charcoal is quite simple. Wood, from one large tree or several small trees, is cut and piled on the ground nearby. The pile is carefully made with the pieces all parallel and close together. When finished the pile is usually about 8-10 feet long, 3 feet high, and 5 feet across at the widest point. The finished pile of wood resembles in shape an upturned canoe. Dry grass is then stuffed into the spaces between the pieces of wood and the pile is covered with dirt, the burner being careful to leave a few air holes so that the fire will receive enough air for partial combustion. The pile is then fired and left to smolder for several days. When the fire has completely died out the dirt is removed and the charcoal is spread out to cool and then bagged for shipment to a buyer.

Impact on Vegetation. The impact of charcoal burning on the natural vegetation of Lower Kikumbulyu is a selective one. Charcoal burners select only those species of trees and shrubs which produce good charcoal, and avoid the rest. The Kamba burners appeared to have

considerable knowledge of the local trees and shrubs and were able to list an impressive number of species that were not good for charcoal manufacture. The most important charcoal-producing species identified by the burners are Acacia mellifera, Acacia brevispica, Newtonia hildebrandtii, and Combretum zeyheri. Among the species unsuitable for charcoal are Baobab (Adansonia digitata), Fig (Ficus spp.), and Commiphora (Commiphora spp.). This concentration of the charcoal burners on a few species may well have a profound effect on the natural landscape. As Spencer has pointed out in reference to the impact of charcoal burning in the arid areas of the world:

. . . the selective impact upon the wild vegetation of a region may be very marked, since the selection process in time may well reduce or clean out selected species from the vegetation association.³¹

Considering the magnitude of the charcoal industry in Lower Kikumbulyu it seems likely that a marked alteration of the natural vegetation will rapidly take place. The precise consequences of such alteration are uncertain but that there will be change, not only in the native flora but in the fauna as well, would appear to be inevitable.

The Impact on Regional Ecology

Ecological Change, Poaching, and Disturbance

The immigration of large numbers of agricultural pioneers into Lower Kikumbulyu has undoubtedly already caused considerable changes in the natural vegetation and affected wildlife populations. This

³¹J. E. Spencer, "On Charcoal Burning, and the Role of the Charcoal Burner," The Cultural Landscape, ed. C. L. Salter (Belmont, Calif.: Duxbury, 1971), p. 120.

increasing human activity has affected wildlife numbers and distribution chiefly through the effects of ecological change and poaching. We might add another less tangible impact of human activity: disturbance. Although this disturbance factor is difficult to measure it probably plays a not insignificant role in the changing patterns of wildlife distribution near expanding human settlements.³² An increase in poaching, or illegal hunting, by the Kamba settlers could be expected. The Kamba traditionally were renowned hunters and the Kenya Game Department considers poaching in the Kamba areas of southern Machakos to be their most serious illegal hunting problem. Poaching is often most severe in newly settled districts and this has proven to be the case in southern Machakos where much new settlement has taken place in recent years.³³

Ecological change is an inevitable consequence of agricultural settlement and could only be prevented by forbidding settlement. Bush clearing to permit planting of crops is the first task each new settler undertakes. Although the Kamba do not practice shifting cultivation they do, when land is available, clear new fields every few years and allow the old fields to regenerate under bush fallow. In

³²One aspect of the disturbance factor may be the occupation by human settlement, even at low densities, of areas of special importance to wild animals at certain times of the year. This thesis has been put forward in regard to human settlement in the Miombo Forest zone of southern Tanzania by G. E. Matzke in "Settlement Reorganization for the Production of African Wildlife in Miombo Forest Lands: A Spatial Analysis" (Unpublished Master's thesis, Oklahoma State University, 1971). See especially pp. 13-22, 55-61, and 79-80.

³³Colony and Protectorate of Kenya, Game Department Annual Report, 1961 (Nairobi: The Government Printer, 1962), p. 15; and Game Department File 19/2, Game Warden, Kiboko, Annual Report, 1968.



Figure 4.8 An uncontrolled fire on the eastern slopes of the Chyulu Hills, probably caused by farmers burning off their fields preparatory to planting. The house visible in the right center of the picture is evidence of the continuing settlement on the foothills of the eastern Chyulus.

Lower Kikumbulyu where settlers have staked out large farms of about fifty acres this means that although a farmer may only cultivate several acres a season he will in a relatively short time have cleared and planted most of his land. Old fields in bush fallow will then be all second growth bush in different stages of secondary succession.

Farmers may also, inadvertently, produce ecological changes over wider areas. One of the traditional techniques of Kamba farmers is to burn their fields just prior to planting. These fires often get out of control and burn large areas of the surrounding bush. The effect of such burning over any length of time is to inhibit the growth of woody vegetation and to favor grass. In fact, controlled burning of grasslands to prevent encroachment of bush has long been an important management tool in East Africa. The Chyulu Hills have been subjected to uncontrolled fires started by farmers for many years and it would appear that the extensive areas of grassland in the Hills are a product of this human activity rather than a naturally produced vegetation association. Charcoal making is another important instrument of ecological change. Large amounts of woody vegetation are consumed by charcoal makers and this activity has been particularly widespread in the newly settled areas of Lower Kikumbulyu. The combined impact of bush clearing, uncontrolled burning, and the removal of large amounts of selected species of trees and shrubs to produce charcoal can effect great changes in dominant vegetation types and alter the whole ecological balance of the area.

The Impact of Settlement on Wildlife in Block 29

Block 29, the eastern half of Lower Kikumbulyu, provides a

good illustration of the impact of agricultural settlement and its associated human activities on wildlife. In mid-1969 the effects of human activity were just beginning to become noticeable in this part of Lower Kikumbulyu. In the past this area has been one of Kenya's most productive hunting blocks, but it is now threatened with destruction as a wildlife area by the influx of pioneer farmers.

Block 29 covers about 450 square miles, most of which carries a dense cover of dry thornscrub vegetation. The dominant vegetation type of Acacia-Commiphora bush provides good habitat for a wide variety of game animals and is particularly suitable for elephant and rhinoceros.

Elephant. The number of elephant present in Block 29 varies as these animals are wide-ranging and appear to move in and out of the block at different times of the year. The elephant population of the block has always been large enough, however, to make it one of Kenya's most popular hunting blocks. The area, in fact, is part of the Tsavo ecological region which contains the largest population of elephant in Africa.³⁴ Block 29 has long had the reputation of producing large trophy elephants. The Game Department records of the weight of all large ivory taken on license in 1964 show that only ten elephants, carrying a total of 200 pounds of ivory, were taken in all of Kenya. Four of these were shot in Block 29. Four elephants with over 180 pounds of ivory were also recorded, and two of these were taken in

³⁴For the distribution of elephants in the Tsavo area, including Block 29, see J. Glover, "The Elephant Problem at Tsavo," East African Wildlife Journal, Vol. I (August, 1963), pp. 30-39.

Block 29.³⁵ The chance of shooting a really large elephant continued to draw hunters as recently as 1968 when 65 hunting parties registered to hunt in the block.³⁶

Rhinoceros. Block 29 has also long been considered to be among the best rhino areas in Kenya. In the late 1950's, when there was serious concern over the suspected decline in rhino numbers throughout the territory, it was decided to capture and translocate rhino in an attempt to restock depleted areas. One of the sites chosen for the capture effort was in Block 29, and a large number of animals were trapped and moved to other parts of Kenya.³⁷ This intensive trapping operation appears to have resulted in no permanent reduction in the block's rhino population, for in a census conducted in 1968 Goddard estimated the rhino population of Block 29 at 300-400.³⁸ This population, unlike that of the elephant, is a permanent one. Studies of the home range and behavior of the black rhinoceros have shown that the species is very sedentary. Rhinos occupy a small home range and tend to remain attached to that area for life. Indeed it appears that population dispersal into available niches in adjacent

³⁵Republic of Kenya, Game Department Annual Report, 1964 (Nairobi: The Government Printer, 1967), p. 9.

³⁶Republic of Kenya, Game Department, File 19/2, Game Warden Kiboko. Annual Report, 1968.

³⁷Colony and Protectorate of Kenya, Game Department, Annual Report, 1958/59, p. 5; and Annual Report, 1960, p. 13 (Nairobi: The Government Printer, 1961).

³⁸J. Goddard, "Aerial Census of Black Rhinoceros Using Stratified Random Sampling," East African Wildlife Journal, Vol. VII (August, 1969), p. 112.

areas does not occur at all among adult rhinoceros.³⁹ The absence of dispersal behavior among adults suggests that the rhino can be eliminated from a region rapidly by overhunting or habitat destruction and that recolonization of such areas by rhino would be, at best, an extremely slow process.

Other Animals. Large numbers of other animals, including giraffe, buffalo, zebra, oryx, and lesser kudu share the range with the rhino and elephant. No accurate counts of these species has ever been made in Block 29, but as most of them range fairly widely it is likely that their numbers vary seasonally. From the number of rhino and elephant present and the numbers of other animals observed from the air during a survey of the block (see below) it may be assumed that the range can support at least moderately high densities of these other species.

Hunting Block 29, then, has for many years been one of Kenya's prime wildlife areas, producing excellent hunting on a sustained basis with no apparent depletion of its wildlife populations. At least this was the case until 1968 when increasing human activity in the area began to affect the wildlife and its habitat. It was in 1968 that pioneer farmers first began to move across the railroad and settle in the hunting block. Since 1968 immigrants have continued to pour into Block 29 and by the middle of 1969 they had moved, at one point, half way across the block (see Map 4.12).

Game Census. In order to determine the density and distribution of wildlife and to establish, if possible, the effect of increased

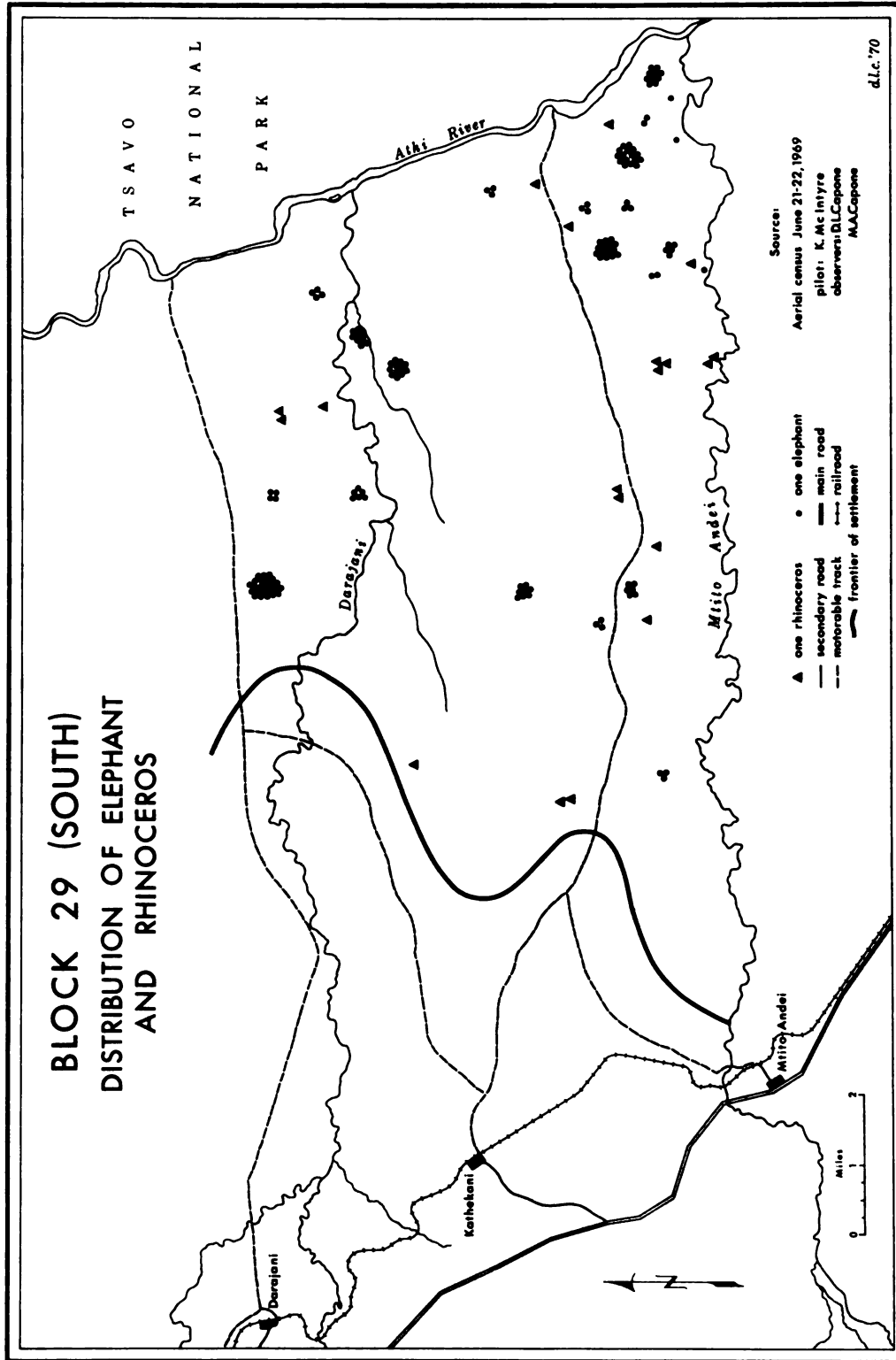
³⁹J. Goddard, "Home Range, Behavior, and Recruitment Rates of Two Black Rhinoceros Populations," East African Wildlife Journal, Vol. V (August, 1967), pp. 135-36.

human activity in Block 29, as aerial game census was conducted in June, 1969. The southern portion of the block, between the Mtito Andei River and the Darajani track was chosen for the census, as this area had been subject to the heaviest settlement pressure (see Map 4.12). The main objective of the census was to locate and record rhinoceros and elephant distribution. Each rhino and elephant spotted was recorded on previously prepared maps of the census area. A tally of other animals seen was also kept, although these were not located on the maps. Flights were conducted during the first and last three hours of daylight, when sun angle and shadow length provide maximum visibility of rhinoceros from the air. The altitude and airspeed were also chosen to facilitate the spotting of rhino.⁴⁰ The census was carried out on June 21 and 22, 1969, using a Cessna 180 aircraft with two observers and pilot. Parallel north-south traverses 1000 meters apart were flown at an altitude of 100-300 feet and an airspeed of 90-100 miles per hour.⁴¹

The census recorded a population of 19 rhinoceros, 140 elephant, over 200 buffalo, 100 zebra, 39 giraffe, and 33 oryx. It should be

⁴⁰For a description of the most effective procedures for censusing rhinoceros from the air, see J. Goddard, "The Validity of Censusing Black Rhinoceros Populations from the Air," East African Wildlife Journal, Vol. V (August, 1967), pp. 18-23.

⁴¹Flights were conducted on the afternoon of June 21 and both the morning and afternoon of the 22nd. Weather was excellent for the two-day period. The sky was cloudless during the morning flight and there was less than 2/10 cloud cover during the two afternoon flights. There was some smoke haze over the census area at the time of all three flights but this caused only a slight reduction in visibility, which was good to excellent for the census period. The starting point for each northbound traverse was located by reference to the Mtito Andei River, which contains many meanders that serve as ideal landmarks from the air. At the end of each



Block 29 (South): Distribution of Elephant and Rhinoceros



pointed out here that these totals are subject to considerable error and should not be taken to represent an exact count of the number of each species in the census area. Elephants are wide-ranging and are able to cover considerable distances in a day. As the census covered a two-day period it is not unlikely that some elephants were counted twice. It is probable, therefore, that the total of 140 elephant recorded is somewhat high. Buffalo, zebra, giraffe, and oryx were counted only incidentally and the totals for these animals are included only in order to indicate the general magnitude of the populations of these species in the census area. The number of rhinoceros observed is certainly no more than a minimum appraisal of the population actually present. Visibility bias is high in most aerial censuses and Goddard has shown that even under ideal conditions the maximum number of rhino that can be spotted from the air never exceeds 50% of the actual population.⁴² The 19 rhinoceros counted in the census probably represent 25-50% of the population of the census area, or an actual population of 38-76 rhinoceros. A population near to the higher figure for the census area would be compatible with Goddard's 1969 estimate of 300-400 for the entire block.

northbound traverse the next, southbound, traverse was lined up by the pilot, using a timed, constant rate turn and checked by reference to the Darjani River. Several trial runs to check wind drift, using known landmarks, were flown before each of the three flights. At the end of each southbound traverse it was possible to check the accuracy of the flight line again by reference to the Mtito Andei River. The pilot did an excellent job of maintaining the prescribed flight lines and the census was concluded with confidence that the flight pattern actually flown was very close to that prescribed.

⁴²J. Goddard, "The Validity of Censusing Black Rhinoceros Populations from the Air," loc. cit., p. 18.

More significant than the number of animals observed was their distribution, particularly the distribution of rhinoceros. No rhino were seen in the western quarter of the census area, where human activity is concentrated. Considering the sedentary nature of the species and its limited home range it would appear that there are no longer any rhino inhabiting that part of Block 29. The reason for the absence of rhino from this area is apparent; the western limit of their distribution coincides closely with the frontier of human settlement (see Map 4.15).

The Future of Wildlife in Block 29. The results of this survey of wildlife distribution indicate that the future of wildlife in Block 29 is not bright. Agricultural settlement continues and the frontier of settlement is expanding rapidly. Even a cautious projection would suggest that the first settlers will probably reach the eastern boundary of the block by late 1971 or early 1972. Unless further settlement is prohibited and this prohibition enforced vigorously, Block 29 will undoubtedly be completely filled with small farms within a very few years. If settlement does continue the combined effects of poaching, ecological change produced by bush clearing and charcoal making, and the disturbance caused by human activity will certainly mean the end of rhinoceros in Block 29. Elephant and other wide-ranging animals may continue to use the area seasonally in reduced numbers, but this will inevitably lead to demands by farmers for control shooting to prevent crop destruction and protect human life. Once control shooting is begun even these small remnants of the once large wildlife populations will disappear.

The increasing threat to rhinoceros and other wild animals in

Block 29 is but one example of the growing conflict between wildlife preservation and human settlement in Kenya. As human population continues to increase the destruction of wildlife and its habitat will inevitably increase with it. The senselessness of this destruction of wildlife in marginal agricultural areas has been pointed out by Leslie Brown, former Chief Agriculturalist of Kenya, and one of East Africa's leading ecologists, who states that:

. . . the present subsistence cultivation systems represent unsound land use and cannot provide a good living for the people anyhow. In the long term, in such areas, it would be more rational to look for other outlets than to slaughter the wild animals so that a few more people can subsist miserably.

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Production at this miserable level is not a sound excuse for the destruction of wild animals, or the destruction of their habitat.⁴³

In Kenya, with its limited natural resource base, prudence would seem to dictate that the wisest use be made of the resources available. To replace wild animals with subsistence agriculture in marginal areas where agricultural experts agree that permanent agriculture cannot succeed is, in ecological terms, unwise land use policy. Economically wildlife is certainly one of Kenya's most valuable resources, contributing substantially to the national income at the present time and capable of greatly increased contribution in the future. Considering the paucity of other resources available, it may not be overstating its value to view the conservation of wildlife as indispensable to the economic development of Kenya.

⁴³ L. Brown, "Wild Animals, Agriculture, and Animal Industry," The Arusha Conference, Papers, Arusha, Tanganyika, 1961, pp. 110-11.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study has viewed one aspect of the national state of Kenya from three discrete directions. The temporal perspective was used in a test of the Jones field theory "model," a procedure that demonstrated (1) the forward and reverse interaction between the five links of the idea-area chain; (2) the political implications of what was initially a non-political idea, another aspect of the field theory model suggested by Jones, in his reference to the Tennessee Valley Authority; (3) the inherently political nature of any idea that has spatial expression; (4) the existence of all three types of movement characterized by Jones as emanating from the model; and (5) the creation of several "circulation fields" produced by the increasing complexity and multiple functions of the conservation idea.

The politically organized area of Kenya, like all such areas, has developed as the result of many ideas and decisions. But within the state Kenya's wildlife conservation areas are large enough, involve sufficient numbers of people, and have resulted from so concentrated a set of decisions over a long period of time that they have become themselves a political area within the state. They are represented in Nairobi by their own administrative officers and are policed by a separate government department. They generate their own circulation fields, pressures, and modifications of the underlying idea. The boundaries of these conservation areas are more than merely administrative; the resources of such areas represent one thing to the state, and another to the people living in or near them.

In multi-ethnic Africa, the effects of the conservation idea underscore the utility of the unified field theory model as a tool in the effort to understand the complex problems facing the new states of the continent.

The contemporary wildlife conservation system of Kenya was analyzed in functional terms in Chapter III. The problems faced in Kenya emanate from several conditions, including (1) the variety of agencies and interest groups that have a hand in the control of conservation areas in the country, (2) the lateness of the emergence of a full-scale conservation effort, which was in effect superimposed on Kenya after the end of the Second World War, when many earlier opportunities for stabilization and control had already been lost, (3) the disturbance of the pre-European ecological balance between men and animals -- a balance that was first disrupted by trophy hunting and land alienation and later by the burgeoning of the human population, and (4) the intensification of pressures on pioneer fringes, bringing hitherto protected areas into the competition-sphere.

The most pressing problems confronting Kenya's wildlife conservation system are those involving human-animal conflict. Land use conflicts in particular pose a serious threat to wildlife populations in many parts of the country. In the pastoral areas of southern Kenya overstocking of domestic animals has been a continuing problem and has resulted in erosion and reduction in the carrying capacity of the range. In agricultural areas the growing conflict between farmers and wildlife is reflected in the high levels of control shooting of wild animals that is necessary to protect human

life and property. In the vast areas of the country outside of the reserves, where wildlife conservation is not a primary objective, and in the Game Reserves where human interests take precedence, future land use will determine the fate of wildlife. The National Parks, although they appear to be secure in themselves, may also suffer from increasingly intensive human use of adjacent land.

Future wildlife conservation problems presented by pastoral land use are exemplified by planned developments in the Masai district of Kajiado. Here the introduction of modern forms of land ownership and group ranching schemes on the land adjacent to the southern boundary of Nairobi National Park threatens the security of the Parks' wildlife populations. The cooperation of these Masai ranchers in a wildlife management program designed to protect the park's wildlife is essential. This cooperation can probably only be achieved if the ranchers can benefit directly from their participation. The proceeds of any sustained yield game cropping schemes must go directly to the landowners. The old approach of distributing benefits from the exploitation of wildlife indirectly, through local district councils, has not proven effective. Only in this way, through direct cash payment, is there a chance that individual landowners will come to appreciate the value of wildlife.

The expansion of agricultural land use has already had an impact on many of Kenya's parks and reserves. In the central highlands the mountain parks, Aberdare and Mt. Kenya, are being encircled by farming settlement and barriers have had to be erected to separate the human and animal communities. It may eventually be necessary to completely fence these two parks to ensure the safety of both men and

animals. The smaller parks and reserves, like Lake Nakuru and Nairobi National Parks and the Lambwe Valley Game Reserve, are particularly sensitive to the effects of land use in adjacent areas but even very large conservation areas like Tsavo National Park, one of the world's largest, is dependent on areas outside the boundaries of the park. Elephants and other animals move in and out of the park regularly, utilizing large areas of land adjacent to the park itself. Changes in land use in these areas will certainly affect the park's wildlife populations and may reduce the carrying capacity of the park as a result.

Much of Kenya's remaining wildlife occupies land that has long been considered unsuitable for agriculture, but in recent years even these marginal lands have begun to be invaded by land-hungry farmers. The utilization of the wild lands of Kenya's arid margins for subsistence cultivation presents one of the most serious potential threats to the survival of wildlife in Kenya.

Chapter IV presented a case study of migration into the arid fringe. The movement of pioneer agriculturalists from central Machakos District into the dry bushland of Lower Kikumbulyu demonstrates that migration behavior is generated by a complex of factors operating at both ends of the stream. Attractions, or "pull" factors include (1) temporary changes in environmental limitations, (2) communication development, (3) the stimulus of existing settlement, however limited, and (4) new economic opportunities. Rural poverty emanating from overpopulation and land pressure operates as a "push" factor promoting migration. Cultural forces, such as the confirmation of ancestral tribal occupance, also encourage migration. Aspects of

social organization, like the utui system of residence, may also contribute to migration behavior and influence patterns of settlement.

The recent settlement history of Lower Kikumbulyu also suggests that pioneer agricultural settlement, even at low density in semi-arid thornscrub, has a profound effect on regional ecology and particularly on wildlife. The retreat of rhinoceros and other animals before the advancing frontier of settlement in Block 29 is convincing evidence of the impact of human occupancy upon the total environment. The major instruments of this impact are (1) land-clearing for agriculture; (2) charcoal-making; (3) fire, a tool of both farmers and charcoal burners; and (4) poaching, an apparently habitual activity in pioneer settlements. Agricultural settlement in the arid fringe is not only damaging to natural environments, and especially to wildlife, but realistic appraisals indicate little chance that farmers can achieve acceptable standards of living in these marginal areas. If the present trend of increasing human movement into the agriculturally marginal areas of Kenya's dry bush country continues unchecked, the natural environment will suffer severe and lasting damage. The final result of this process may be the displacement of rich wildlife resources by an impoverished agricultural population, barely able to obtain a subsistence living.

Pioneer migration into the arid fringe is but one symptom of the basic problem confronting wildlife conservation in Kenya; the alarmingly rapid expansion of the human population. At the present rate of increase Kenya's population will double before the end of the century. One consequence of such a high rate of population growth is certain to be increasing pressure on the nation's wild lands by

farmers and pastoralists. The long-settled areas of central and western Kenya are even now unable to fully support their burgeoning agricultural populations, as evidenced by high rates of migration from these areas.¹

Kenya's population will probably continue to increase at or near present rates for some time. Experience in other parts of the developing world would suggest that any substantial reduction in population growth rates is unlikely in the near future. Most of this additional population will have to be absorbed in the rural areas. Kenya is predominantly rural and the overwhelming majority of its people depend upon agriculture for subsistence. The country's urban sector, though growing rapidly, is far too small to absorb any significant proportion of this increase.² Rising population densities in the rural areas will mean that considerable advances in productivity will be necessary merely to sustain existing standards of living. Even assuming a steady improvement in the present inefficient agricultural techniques any gains in productivity are likely to be erased by population growth. Higher populations in the rural areas will also lead to further fragmentation of land holdings and a decrease in the size of the average farm. When these consequences of population growth in the rural areas are considered in the light of the rising expectations of all of Kenya's people, it is apparent that, in a relative sense at least, the peasant farmer will be worse off in ten or twenty years than he is today. In fact, it is not inconceivable that the

¹See S. H. Ominde, op. cit., pp. 122-135.

²D. M. Etherington, "Projected Changes in Urban and Rural Population in Kenya and Implications for Development Policy," East African Economic Review, Vol. I, No. 2 (1965), pp. 65-83.

position of Kenya's farmers in ten years will be, in absolute terms, worse than it is today.

As population pressures increase many people will be forced to abandon small, unproductive land holdings in their traditional homelands and seek livelihoods elsewhere. With the small urban sector unable to accommodate them, the only outlet for many landless farmers will be migration into the arid and semi-arid wild lands where they may be able to eke out a bare subsistence living. Indeed, this process has already begun, in southern Machakos and elsewhere in Kenya. The present movement of pioneer farmers into the arid fringe is just a trickle, however, compared to the flood of migrants that the next ten or twenty years may produce. The inevitable result of large-scale movement of subsistence farmers into wild lands will be the virtual elimination of wildlife in these areas.

If wild animals are to be preserved in Kenya's dry bush country some way must be found to prevent the influx of settlers into the remaining wildlife habitat. But how is this to be accomplished? Administrative restrictions on population movement and settlement is one possible answer, but this approach has proven ineffective in the past. The example of recent movement into Lower Kikumbulyu is evidence of the difficulty of preventing or restricting pioneer settlement. As the pressures inducing this kind of migration increase in the future such restrictions will become even more difficult to enforce. A satisfactory solution to this problem is one that will reduce population pressure in the rural areas, thereby eliminating the major impetus to migration.

What is urgently needed, then, in Kenya, is a long-range program of agricultural development aimed at increasing productivity in the traditional farming areas. Productivity must be increased to levels that will provide an acceptable standard of living for the rapidly growing rural population. This is no easy task; it will require a virtual revolution in agricultural methods and organization but it is technically feasible and is essential if the destruction of the country's wild lands is to be prevented. The magnitude of the effort required to transform agriculture in Kenya suggests that outside assistance may be necessary to provide the technical and financial resources needed to carry out such a development program. In this regard it would be particularly appropriate for conservation agencies to assist in the development effort.

Conservation organizations that are concerned about wildlife preservation should reassess their priorities and direct their attention and efforts toward the solution of the basic conservation problem, human population growth and its impact. Organizations like the International Union for the Conservation of Nature, the World Wildlife Fund, and others should cooperate in the effort to develop Kenya's agricultural areas so that population pressure and resultant migration into wildlife habitat may be reduced or eliminated. In addition to the practical value of such assistance, the involvement of these organizations, with their considerable financial resources and prestige, will serve to focus public attention on the crucial link between agricultural development and wildlife preservation in Kenya. -

This study has shown that wildlife conservation problems, in Kenya, are essentially human problems. It is the habitat-destructive activities of man, as herder and farmer that pose the most serious threat to wildlife today. The growing competition for land between men and wild animals must be reduced if the conservation effort of the last 75 years in Kenya is not to be largely destroyed in the next several decades. The future survival of Kenya's magnificent wildlife resources, in all their variety and abundance, depends upon the solution of this basic conflict.

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APPENDICES

Appendix I
HUNTING LICENSES ISSUED 1956-1957

Licences Issued	1956			1957		
	Visitors	Residents	Total	Visitors	Residents	Total
Full	63	449	512	185	523	708
14-day	10	42	52	17	42	59
Private Land	--	150	150	3	185	188
Bird	--	--	970	--	--	1,383
1st Elephant	--	--	117	119	64	183
2nd Elephant	--	--	19	15	9	24
Rhinoceros	--	--	129	137	67	204
Leopard	--	--	33	112	8	120
Masai Lion	--	--	20	78	7	85
Grevy Zebra	--	--	38	89	10	99
Giraffe	--	--	12	10	1	11
Ostrich	--	--	24	26	13	39
Colobus Monkey	--	--	3	--	--	--
Blue Monkey	--	--	--	--	--	--

Source: Kenya Game Department Annual Reports, 1956/57.

Appendix I (continued)
HUNTING LICENSES ISSUED 1958-1960

Licenses Issued	1958			1959			1960		
	Visitors	Residents	Total	Visitors	Residents	Total	Visitors	Residents	Total
Full	189	490	679	175	393	568	163	478	641
14-day	36	52	88	33	19	52	20	28	48
Private Land	8	141	149	26	129	255	35	131	166
Bird	--	--	1,070	--	--	852	--	--	366
SPECIAL LICENCES--									
1st Elephant	201	39	240	144	46	160	137	49	186
2nd Elephant	16	9	25	16	11	27	23	13	36
Rhinoceros	114	16	130	94	15	109	102	12	114
Masai Lion	87	2	89	70	5	75	63	5	68
Non-Masai Lion	25	13	38	48	12	60	41	11	52
Leopard	136	2	138	127	12	139	128	6	134
Hippopotamus	--	--	--	--	2	2	1	--	1
Buffalo	248	301	549	356	275	631	417	332	749
Grevy's Zebra	91	4	95	68	9	77	63	5	68
Bongo	7	11	18	18	13	31	19	11	30
Eland	87	30	117	122	40	162	115	31	146
Greater Kudu	20	4	24	31	6	37	15	5	20
Hunter's Antelope	22	--	22	21	3	24	20	2	24
Blue Monkey	3	--	3	--	--	--	4	--	4
Ostrich	26	8	34	28	12	40	28	12	40

Source: Kenya Game Department Annual Reports 1958/59 and 1960.

Appendix I (continued)
HUNTING LICENCES ISSUED 1961-1963

Licences Issued	1961		1962		1963	
	Visitors	Residents	Total	Visitors	Residents	Total
Full	205	517	722	197	465	622
14-day	18	17	35	25	24	49
Private Land	25	148	173	36	111	147
Bird	--	--	803	--	--	716
						749
						50
						199
						745
SPECIAL LICENCES--						
1st Elephant	148	29	177	148	34	182
2nd Elephant	22	9	31	19	6	25
Rhinoceros	100	11	111	72	7	79
Masai Lion	71	3	74	67	5	72
Non-Masai Lion	44	29	73	52	31	83
Leopard	148	6	154	147	12	159
Hippopotamus	--	--	--	1	--	1
Buffalo	446	387	833	446	434	880
Grevy's Zebra	90	4	94	88	14	102
Bongo	25	16	41	15	18	33
Eland	131	37	168	147	42	189
Greater Kudu	8	3	11	12	7	19
Hunter's Antelope	31	1	32	27	1	28
Blue Monkey	--	--	--	--	--	--
Ostrich	52	7	59	42	18	60
						193
						24
						77
						100
						84
						196
						--
						862
						102
						54
						225
						21
						19
						14
						74

Source: Kenya Game Department Annual Reports, 1961-1963.

Appendix I (continued)

HUNTING LICENCES ISSUED 1964-1965

Licences Issued	1965			1964		
	Visitors	Residents	Total	Visitors	Residents	Total
Full	307	636	943	227	591	818
14-day	34	11	45	47	20	67
Private Land	62	97	159	39	104	143
Bird	--	525	525	--	672	672
SPECIAL LICENCES						
1st Elephant	163	57	220	124	42	166
2nd Elephant	20	7	27	17	4	21
Rhinoceros	47	2	49	49	8	57
Masai Lion	118	21	139	90	22	112
Non-Masai Lion	25	13	38	28	18	46
Leopard	224	45	269	161	27	188
Buffalo	450	347	797	343	346	689
Grevy Zebra	51	29	80	37	18	55
Bongo	15	19	34	25	18	43
Eland	204	66	270	159	54	213
Greater Kudu	21	9	30	17	21	38
Lesser Kudu	157	81	238	70	28	98
Antelope (H)	--	1	1	2	--	--
Blue Monkey	3	--	3	2	1	3
Ostrich	44	17	61	32	14	46
Duiker Blue	6	--	6	3	--	3
Duiker Red	3	--	3	5	2	7
Duiker Black	4	--	4	--	--	--
Gerenuk	176	57	233	79	23	102
Forest Hog (G)	33	7	40	20	2	22
Giraffe	5	1	6	2	--	2
Klipspringer	60	6	66	35	2	37
Monkey (P)	--	--	--	--	--	--
Monkey (Pat)	1	--	1	1	1	2
Monkey (C)	3	4	7	6	12	18
Oryx (F.E.)	158	65	223	95	29	124
Beisa Oryx	97	46	143	25	11	36
Reedbuck (C)	26	3	29	11	1	12
Suni	4	--	4	6	1	7
Topi	47	18	65	32	12	44

Source: Kenya Game Department Annual Reports, 1964-1965.

Appendix II

GAME ANIMALS WHICH MAY BE HUNTED AND KILLED ON LICENCE

	Number which may be hunted and killed under a full licence	Number which may be hunted and killed under a 14-day licence	Number which may be hunted and killed under a Bird licence
Bushbuck, <u>Tragelaphus scriptus</u> (Pallas).	2	1	-
Crocodile. <u>Crocodilus niloticus</u> (Laurenti).	2	1	-
Dikdik. <u>Rhyncotragus kirkii</u> (Gunther), and <u>R. guentheri</u> (Thomas). Both species combined.	2	1	-
Duiker, Grey. <u>Sylvicapra grimmia</u> (Linn.).	2	1	-
Gazelle, Grant's. <u>Gazella granti</u> (Brooke). All races combined.	2	1	-
Gazelle, Thomson's. <u>Gazella thomsonii</u> (Gunther).	2	1	-
Hartebeest, Coke's. <u>Alcelaphus buselaphus cokii</u> . Gunther.	2	1	-
Impala. <u>Aepyceros melampus</u> . Lichtenstein.	2	1	-
Oribi, Cotton's Haggard's and Kenya. All species and races of genus <u>Ourebia</u> Laurillard combined.	2	1	-
Reedbuck, Bohor. <u>Redunca redunca</u> (Pallas).	1	-	-
Steinbok. <u>Raphicerus campestris</u> (Thunberg).	1	-	-
Warthog. <u>Phaecochoerus aethiopicus</u> (Pallas).	2	-	-
Waterbuck, Common. <u>Kobus allipsiprymnus</u> (Ogilby).	1	-	-

Appendix II (continued)

	Number which may be hunted and killed under a full licence	Number which may be hunted and killed under a 14-day licence	Number which may be hunted and killed under a Bird licence
Waterbuck, Defassa. <u>Kobus</u> <u>defassa</u> (Ruppell).	1	-	-
Wildebeest. <u>Connochaetes</u> <u>taurinus</u> (Burchell).			
All races combined.	2	1	-
Zebra, Common or Burchell's. <u>Equus burchelli</u> (Gray).			
All races combined.	3	1	-
Geese and Ducks, including Teal. All members of the family <u>Anatidae</u> .	unlimited	unlimited	unlimited
Francolins, Partridges, Quails and Guinea Fowls. All members of the families <u>Phasianidae</u> and <u>Turnicidae</u> .	unlimited	unlimited	unlimited
Lesser Bustards. All mem- bers of the genera <u>Eupodotis</u> , <u>Lophotis</u> and <u>Lissotis</u> , but excluding the Greater Bustards of the gen- era <u>Ardeotis</u> and <u>Neotis</u> .	unlimited	unlimited	unlimited
Snipe. All members of the genera <u>Rostratula</u> , <u>Capella</u> and <u>Lymno-</u> <u>cryptes</u> .	unlimited	unlimited	unlimited
Sandgrouse. All members of the family <u>Pterocli-</u> <u>didae</u> .	unlimited	unlimited	unlimited
Pigeons and Doves. All members of the family <u>Columbidae</u> .	unlimited	unlimited	unlimited

Source: Republic of Kenya, Legal Notice No. 131/64, The Wild
Animals Protection (Amendment of Schedules) Notice, 1964,
Third Schedule, Part II.

Appendix III

SPECIAL LICENCE FEES

Animals which may be Hunted and Killed under Special Licence	Number of Special Licences which may be Issued to a Holder of a Full Licence	Fee per Special Licence
		Sh.
Bongo, <u>Boocercus eurycerus</u> (Ogilby)	1	250
Buffalo, <u>Syncerus caffer</u> (Sparrman)	3	50
Duiker, Blue <u>Cephalophus monticola</u> Thunberg. All races combined.	1	20
Duiker, Red or Harvey's <u>Cephalophus natalensis</u> A. Smith. All races combined.	1	20
Duiker, Foster's or Hook's Black Fronted <u>Cephalophus nigrifrons</u> Gray. All races combined.	1	20
Eland, <u>Taurotragus Oryx</u> (Pallas)	1	100
Elephant, <u>Loxodonta africana</u> (Blumenbach)	2	1,500 1st Licence 2,500 2nd Licence
Gerenuk, <u>Litocranius walleri</u> (Brooke)	1	50
Giant Forest Hog, <u>Hybchoerus meinertzhageni</u> Thomas	1	30
Giraffe, Common and Reticulated, <u>Giraffa Camelopardalis</u> (Linn.) and <u>G. reticulata</u> De Winton. All races of both species combined.	1	750
Hirola or Hunter's Antelope. <u>Damaliscus hunteri</u> (P.L. Sclater)	1	150
Klipspringer, <u>Oreotragus oreotragus</u> (Zimmerman)	1	30
Kudu Greater, <u>Tragelaphus strepsiceros</u> (Pallas)	1	200
Kudu Lesser, <u>Tragelaphus imberbis</u> (Blyth)	1	100
Leopard, <u>Panthera pardus</u> (Linn.)	1	500
Lion Masai, <u>Panthera leo massaica</u> (Neumann) (i.e. all licences for Narok, Kajiado, Taita, and Machakos and Samburu Districts)	1	400
Lion. Other races of <u>Panthera leo</u> (i.e. licences for any other District)	1	200
Monkey, Blue or Sykes, <u>Cercopithicus mitis</u> (Wolf). All races combined.	1	20

Appendix III (continued)

SPECIAL LICENCE FEES

Animals which may be Hunted and Killed under Special Licence	Number of Special Licences which may be Issued to a Holder of a Full Licence	Fee per Special Licence Sh.
Monkey, Putty Nosed, <u>Cercopithicus nictitans</u> (Linn.). All races combined.	1	30
Monkey, Red or Patas, <u>Erythrocerus patas</u> (Schreber). All races combined.	1	30
Monkey, Black and White Colobus. All races of <u>Colobus abyssinicus</u> (Oken) and <u>C. Angolensis</u> P.L. Sclater, combined.	1	40
Oryx, Fringe Eared, <u>Oryx beisa callotis</u> Thomas.	1	80
Oryx, Beisa, <u>Oryx Beisa beisa</u> (Ruppell) and <u>O. Beisa annectens</u> Hollister. Both races combined.	1	80
Ostrich. <u>Struthia camelus</u> Linn. All races combined.	1	100
Reedbuck, Chanler's Mountain, <u>Redunca Fulvorufula chanleri</u> (W. Rothschild)	1	30
Rhinoceros, <u>Diceros bicornis</u> Linn.	1	2,000
Suni, <u>Nesotragus moschatus</u> von Deuben. All races combined.	1	20
Topi, <u>Damaliscus korrigum</u> (Ogilby). All races combined.	1	40
Zebra, Grevy's, <u>Equus grevyi</u> Oustalet	1	150

Source: Republic of Kenya, Legal Notice 94, The Wild Animals Protection Act (Amendment of Schedules) Order 1967.

Appendix IV

CONTROLLED AREA FEES

First Column	Second Column Sh.
Bongo. <u>Boocercus eurycerus</u> (Ogilby) Male	500
Bongo. <u>Boocercus eurycerus</u> (Ogilby) Female	2,000
Buffalo. <u>Syncerus caffer</u> (Sparrman)	100
Bushbuck. <u>Tragelaphus scriptus</u> (Pallas)	30
Crocodile. <u>Crocodilus niloticus</u> (Laurenti)	50
Dikdik. <u>Rhynoctragus kirkii</u> (Gunther), or <u>R. Guentheri</u> Thomas	10
Duiker, Grey. <u>Sylvicapra grimmia</u> (Linn.)	20
Duiker, Blue. <u>Cephalophus monticola</u> Rhunberg	40
Duiker, Red or Harvey's. <u>Cephalophus natalensis</u> A. Smith	40
Duiker, Foster's or Hook's Black Fronted. <u>Cephalophus nigifrons</u> Gray	40
Eland. <u>Taurotragus oryx</u> (Pallas)	200
Elephant. <u>Loxodonta africana</u> (Blumenbach)--	
(a) when the total weight of both tusks is less than 140 lb.	200
(b) when the total weight of both tusks is 140 lb. or more, but less than 200 lb.	500
(c) when the total weight of both tusks is 200 lb. or more	1,000
Gazelle, Grant's. <u>Gazella granti</u> (Brooke)	20
Gazelle, Thomson's. <u>Gazella Thomsonii</u> Gunther	20
Gerenuk. <u>Litocranius walleri</u> (Brooke)	100
Giant Forest Hog. <u>Hylochoerus meinertzhageni</u> Thomas	60
Giraffe, Common or Reticulated. <u>Giraffa camelopardalis</u> (Linn.) or <u>G. reticulata</u> De Winton	1,500
Hartebeest, Coke's. <u>Alcelaphus buselaphus Cokii</u> Gunter	50
Hirola or Hunter's Antelope. <u>Damaliscus hunteri</u> (P.L. Sclater)	300
Impala. <u>Aeypceros melampus</u> Lichtenstein	20
Klipspringer. <u>Oreotragus oreotragus</u> (Zimmerman)	60
Kudu Greater. <u>Tragelaphus strepsiceros</u> (Pallas)	400
Kudu Lesser. <u>Tragelaphus imberbis</u> (Blyth)	200
Leopard. <u>Panthera pardus</u> (Linn.)	1,000
Lion, Masai. <u>Panthera leo massaica</u> (Neumann) (i.e. hunted, killed or captured in Narok, Samburu, Kajiado, Taita, or Machakos Districts)	800
Lion, other races, or <u>Panthera leo</u> (i.e. hunted, killed or captured in other districts)	400
Monkey, Blue or Sykes. <u>Ceropithicus mitis</u> (Wolf)	40
Monkey, Putty Nosed. <u>Ceropithicus nictitans</u> (Linn.)	60
Monkey, Red or Patas. <u>Erythrocerus patas</u> (Schreber)	60

Appendix IV (continued)

CONTROLLED AREA FEES

First Column	Second Column Sh.
Monkey, Black and White Colobus. <u>Colobus abyssinicus</u> (Oken) or <u>C. Angolensis</u> P. L. Sclater	80
Oribi, Cotton's, Haggard's or Kenya. All species and races of genus <u>Ourebia</u> Laurillard	20
Oryx, Fringe Eared. <u>Oryx beisa callotis</u> Thomas	160
Oryx, Beisa. <u>Oryx Beisa beisa</u> (Ruppell) or <u>O. beisa annectens</u> Hollister	160
Ostrich. <u>Struthia camelus</u> Linn.	200
Reedbuck, Chanler's Mountain. <u>Redunca fulvorufula chanleri</u> (W. Rothschild)	60
Reedbuck, Bohor. <u>Redunca</u> (Pallas)	30
Rhinoceros. <u>Diceros biicornis</u> Linn.	2,000
Steinbok. <u>Raphicerus campestris</u> (Thunberg)	20
Suni. <u>Nesotragus moschatus</u> von Deuben	40
Topi. <u>Damaliscus Korrigum</u> (Ogilby)	80
Warthog. <u>Phacochoerus aethiopicus</u> (Pallas)	20
Waterbuck, Common. <u>Kobus ellipsiprymnus</u> (Ogilby)	50
Waterbuck, Defassa. <u>Kobus defassa</u> (Ruppell)	50
Wildebeest. <u>Connochaetes taurinus</u> (Burchell)	40
Zebra, Common or Burchell's. <u>Equus burchelli</u> (Gray)	50
Zebra, Grevy's. <u>Equus grevyi</u> Oustalet	300

Source: Republic of Kenya, Legal Notice 93, The Wild Animals Protection Act (Controlled Areas) (Changes in Fees) Order 1967.

Appendix V

CONTROLLED AREA FEES

	<u>Sh.</u>
African Wild Cat. All races of <u>Felis lybica</u> Forester	10
Baboons. All species and races of the genus <u>Papio</u> Brisson	5
Bushpig. <u>Potamochoerus porcus</u> (Linn.)	Nil
Bushbabies and Galago. All species and races of the genus <u>Galago</u> Geoffrey	10
Chameleons. All species of the genera <u>Microsaura</u> , <u>Chaemeleo</u> and <u>Rhampholeon</u>	Nil
Civet Cats. All species of the genera <u>Civettictus</u> Pocock and <u>Nandina</u> Grey	10
Genet Cats. All species of the genus <u>Genetta</u> Oken	10
Hedgehogs. All species of the genus <u>Atelevix</u> Pomel	5
Honey Badgers or Ratels. All species of the genus <u>Mellivora</u> Storr	10
Hyaenas. All species of the genera <u>Crocuta</u> Kaup and <u>Hyaena</u> Mayer	Nil
Jackals. <u>Canis aureus</u> (Heller), <u>C. adustus</u> (Heller) and <u>C. mesomelas</u> (Heller)	10
Mongoose. All species of the genera <u>Herpestes</u> Illinger, <u>Myonax</u> Thomas, <u>Helogale</u> Gray, <u>Atilax</u> Cuvier, <u>Mungos</u> Geoffroy, <u>Ichneumia</u> (Geoffroy), <u>Bdeogale</u> (Peters), and <u>Rhyncogale</u> Thomas	10
Monkey, Vervet. All races of <u>Cercopithecus aethiops</u> Linn.	5
Polecats, Zorillas and Striped Weasels. All species of the genera <u>Ictonyx</u> Kaup and <u>Poecilogale</u> Thomas	10

Appendix V (continued)

	<u>Sh.</u>
Porcupines. All species of the genus <u>Hystrix</u> Linn.	5
Spring Haas. All species of the genus <u>Pedetes</u> Illinger.	5
Squirrels. All species of the families <u>Scuiridae</u> Gray and <u>Anomaluridae</u> Gill	5
Tortoises. All species of the family <u>Testudinidae</u>	5
Geese and Ducks, including Teal. All members of the family <u>Anatidae</u>	5
Francolins, Partridges, Quails and Guinea Fowls. All members of the families <u>Phasianidae</u> and <u>Turnicidae</u>	5
Lesser Bustards. All members of the genera <u>Eupodotis</u> , <u>Lophotis</u> and <u>Lissotis</u> , but excluding the Greater Bustards of the genera <u>Ardeotis</u> and <u>Neotis</u>	5
Snipe. All members of the genera <u>Rostratula</u> , <u>Capella</u> and <u>Lymnocyrtus</u>	5
Sandgrouse. All members of the family <u>Pteroclididae</u>	5
Pigeons and Doves. All members of the family <u>Columbidae</u>	5
Source: Republic of Kenya, <u>The Wild Animals Protection (Controlled Areas) Notice, 1964, Fourth Schedule.</u>	

Appendix VI

ANIMALS PROTECTED THROUGHOUT KENYA

1. All game animals when obviously immature, i.e. not full grown.
2. All game animal mothers when--
 - (a) pregnant;
 - (b) in a condition that indicates they are suckling young, whether or not the young are apparent; or
 - (c) accompanied by their immature offspring, whether or not the offspring are dependant.
3. Females of the following species:
 - (a) Lion. Panthera leo (Linn.). All races.
 - (b) Giraffe, Common (Giraffa camelopardalis Linn.) and Reticulated (G. reticulata de Winton).
4. All individuals of the following species, subspecies, or groups:
 - Aard-wolf. Proteles cristatus (Sparrman).
 - Aard-wark. Oryctoropus afer (Pallas).
 - Bat-eared Fox. Otocyon megalotis (Desmarest).
 - Birds. All birds other than game birds (Third and Fourth Schedules), queleas (members of the genus quelea), and mouse birds (members of the genus colius).
 - Caracal. Felis caracal (Schreber).
 - Cheetah. Acinonyx jubatus (Schreber).
 - Dugong. Dugong dugong (Müller).
 - Duiker, Yellow Backed. Cephalophus silvicultor (Afzelius).
 - Elephant. Loxodonta africana (Blumanbach). All elephants which do not carry tusks weighing more than twenty-five pounds in aggregate.
 - Golden Cat. Felis aurata (Temminck).
 - Hartebeest, Jackson's, Lelwel, Kenya, Nakuru and Neumann's. All races and hybrid races of Alcelaphus buselaphus (Pallas) other than the race known as Coke's Hartebeest. A. buselaphus cokii Gunther.
 - Hippopotamus. Hippopotamus amphibius Linn.
 - Hyrax, Rock and Tree. All members of the genera Dendrohyrax Gray, Heterohyrax Gray, and Procavia storr.
 - Kob, Thomas's or Uganda. Adonota kob thomasi (P. L. Sclater).
 - Monkey, Mangabey. Cercocebus galeritus Peters. All races.
 - Monkey, Red Colobus. Colobus badius Peters. All races.
 - Monkey, de Brazza's. Cercopithecus neglectus Schlegel. All races.
 - Marine Turtle, Green. Chelone mydas (Linn.).
 - Otters, River and Clawless. All members of the genera Lutra Brisson and Aonyx Lesson.

Appendix VI (continued)

ANIMALS PROTECTED THROUGHOUT KENYA

Pangolin, Tree and Ground Pangolins or Scaly Ant-eaters. All members of the family Manidae.
 Potto. Perodicticus potto (Müller). All races.
 Roan Antelope. Hippotragus equinus (Desmarest). All races.
 Sable Antelope. Hippotragus niger (Harris).
 Serval Cat. All races of Felis brachyura Wagner, and Felis serval Schreber.
 Sitatunga. Tragelaphus spekii (P. J. Sclater). All races.
 Wild Dog. Lycaon pictus (Temminck).

Source: Republic of Kenya, Legal Notice No. 131/64, The Wild Animals Protection (Amendment of Schedules) Notice, 1964.

Appendix VII

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

Controlled Area Block Nos...	1	2	3	4	5	6	7	8	9	10	11	12
Bush Buck	--	--	--	--	--	--	--	--	--	--	--	--
Crocodile	--	--	--	--	--	--	--	--	--	--	--	--
Dikdik	--	--	5	--	--	--	--	--	--	--	--	--
Duiker Grey	--	--	--	--	--	--	--	--	--	--	--	--
Gazelle Grant	4	7	--	--	--	--	--	--	--	--	--	1
Gazelle Thomson's	--	--	--	--	--	--	--	--	--	--	--	--
Hartebeest Cokes	--	--	--	--	--	--	--	--	--	--	--	--
Impala	1	--	8	--	--	--	--	--	--	--	--	--
Oribi	--	--	--	--	--	--	--	--	--	--	--	--
Reedbuck	--	--	--	--	--	--	--	--	--	--	--	--
Steinbuck	--	--	--	--	--	--	--	--	--	--	--	--
Warthog	--	--	--	--	--	--	--	--	--	--	--	--
Waterbuck Common	--	--	--	--	--	--	--	--	--	--	--	--
Waterbuck Defassa	--	--	--	--	--	--	--	--	--	--	--	--
Wildebeest	--	--	--	--	--	--	--	--	--	--	--	--
Zebra Common	4	--	13	--	--	--	--	--	--	--	--	--
Bongo	--	--	--	--	--	--	--	--	--	--	--	--
Buffalo	5	--	--	--	--	--	--	--	--	--	--	--
Duiker Blue	--	--	--	--	--	--	--	--	--	--	--	--
Duiker Black	--	--	--	--	--	--	--	--	--	--	--	--
Eland	--	--	--	--	--	--	--	--	--	--	--	--
Elephant	2	--	--	--	--	--	--	--	--	--	--	--
Gerenuk	8	--	3	--	--	--	--	--	--	--	--	--
Forest Hog	--	--	--	--	--	--	--	--	--	--	--	--
Giraffe	--	--	--	--	--	--	--	--	--	--	--	--
Hartebeest Hybrid	--	--	--	--	--	--	--	--	--	--	--	--
Klipspringer	--	--	1	--	--	--	--	--	--	--	--	--
Kudu Lesser	--	--	--	--	--	--	--	--	--	--	--	--
Kudu Greater	--	--	--	--	--	--	--	--	--	--	--	--
Leopard	--	--	1	--	--	--	--	--	--	--	--	--
Lion Masai	--	--	--	--	--	--	--	--	--	--	--	--
Lion Other	--	--	--	--	--	--	--	--	--	--	--	--
Monkey Blue	--	--	--	--	--	--	--	--	--	--	--	--
Monkey P/Nosed	--	--	--	--	--	--	--	--	--	--	--	--
Monkey Patas	--	--	--	--	--	--	--	--	--	--	--	--
Monkey Colobus	--	--	--	--	--	--	--	--	--	--	--	--
Oryx Fringed Eared	--	--	--	--	--	--	--	--	--	--	--	--
Oryx Beisa	9	--	2	--	--	--	--	--	--	--	--	--
Ostrich	--	--	--	--	--	--	--	--	--	--	--	--
Reedbuck Chanlers	--	--	2	--	--	--	--	--	--	--	--	--
Rhinoceros	--	--	--	--	--	--	--	--	--	--	--	--
Suni	--	--	--	--	--	--	--	--	--	--	--	--
Topi	--	--	--	--	--	--	--	--	--	--	--	--
Zebra Grevys	12	--	7	--	--	--	--	--	--	--	--	--

Source: Kenya Game Department Annual Report, 1965

Appendix VII (continued)

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

[illegible]

Appendix VII (continued)

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

[illegible]

Appendix VII (continued)

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

[illegible]

Appendix VII (continued)

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

Controlled Area Block Nos...	49	50	51	52	53	55	54	56	57	58	59	60
Bush Buck	--	--	2	--	--	--	--	--	2	2	4	3
Crocodile	--	--	--	--	--	--	--	--	--	--	--	--
Dikdik	--	--	--	1	3	--	--	--	15	19	8	--
Duiker Grey	--	--	--	--	3	--	--	--	--	--	--	1
Gazelle (G)	3	2	16	10	5	--	--	--	12	42	49	--
Gazelle (T)	--	2	16	8	--	--	--	--	36	70	77	8
Hartebeest (C)	--	--	--	--	--	--	--	--	8	18	83	20
Impala	--	--	12	3	15	--	--	--	39	74	41	34
Oribi	--	--	--	--	--	--	--	--	--	--	1	30
Reedbuck	--	--	--	--	--	--	--	--	--	--	3	5
Steinbuck	--	--	3	1	--	--	--	--	1	2	--	--
Warthog	--	--	1	--	--	--	--	--	6	29	13	25
Waterbuck (C)	--	1	--	--	--	--	--	--	--	2	--	8
Waterbuck (D)	--	--	--	--	--	--	--	--	2	3	1	18
Wildebeest	--	--	--	--	--	--	--	--	15	48	17	6
Zebra (C)	1	8	19	--	--	--	--	--	33	77	100	75
Bongo	--	--	--	--	--	--	--	--	--	--	--	--
Buffalo	--	--	6	2	2	--	--	--	13	12	5	29
Duiker Blue	--	--	--	--	--	--	--	--	--	--	--	--
Duiker Red	--	--	--	--	--	--	--	--	--	--	--	--
Duiker Black	--	--	--	--	--	--	--	--	--	--	--	1
Eland	--	--	5	--	4	2	--	--	3	6	14	6
Elephant	1	--	--	--	6	--	--	--	--	--	--	--
Gerenuk	--	1	1	3	9	--	--	--	--	--	--	--
Forest Hog	--	--	--	--	--	--	--	--	--	--	--	--
Giraffe	--	--	--	--	--	--	--	--	--	--	--	--
Hartebeest (H)	--	--	--	--	--	--	--	--	--	--	--	--
Klipspringer	--	--	--	1	--	--	--	--	--	--	1	--
Kudu (L)	--	--	--	1	--	--	--	1	--	2	--	--
Kudu (G)	--	--	--	3	--	--	--	--	--	--	--	--
Leopard	--	--	2	--	6	--	--	--	21	11	10	10
Lion (M)	--	--	--	--	--	--	--	--	8	5	--	8
Lion (O)	--	--	--	--	1	--	--	--	--	--	--	--
Monkey (B)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (P)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (Pat)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (C)	--	--	--	--	--	--	--	--	--	2	--	--
Oryx (F.E.)	--	--	--	--	--	--	--	--	2	--	3	3
Oryx (B)	1	--	1	17	7	--	--	--	--	--	--	--
Ostrich	--	--	--	--	--	--	--	--	1	3	1	--
Reedbuck (C)	--	--	--	--	--	--	--	--	--	2	2	--
Rhinoceros	--	--	--	--	2	--	--	--	--	--	--	--
Suni	--	--	--	--	--	--	--	--	--	--	--	--
Topi	--	--	--	--	--	--	--	--	4	8	4	21
Zebra (C)	--	--	8	11	7	--	--	--	--	--	1	4

Appendix VII (continued)

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

Controlled Area Block Nos....	61	62	63	64	65	66	67	68	69	70	71	72
Bush Buck	--	3	--	2	--	2	--	--	--	--	--	--
Crocodile	--	--	--	--	--	--	--	--	--	--	3	--
Dikdik	--	3	9	2	2	2	8	--	--	--	--	--
Duiker Grey	--	--	1	--	--	1	--	--	--	--	--	--
Gazelle (G)	--	23	60	38	38	262	25	2	--	--	--	--
Gazelle (T)	--	8	10	28	29	22	34	--	--	--	--	--
Hartebeest (C)	--	14	19	7	9	25	3	--	--	--	--	2
Impala	4	15	51	34	25	46	25	--	--	--	--	2
Oribi	11	1	--	1	--	--	--	--	--	--	--	--
Reedbuck	1	1	--	--	--	2	1	--	--	--	--	--
Steinbuck	1	3	9	2	1	3	3	--	--	--	--	--
Warthog	1	14	3	6	3	18	3	--	--	--	--	--
Waterbuck (C)	1	--	--	--	5	15	--	--	--	--	--	1
Waterbuck (D)	2	5	--	1	4	10	2	--	--	--	--	1
Wildebeest	--	10	4	16	29	31	6	--	--	--	--	--
Zebra (C)	18	25	58	76	45	90	42	--	--	--	--	3
Bongo	--	--	--	--	--	--	--	--	--	--	--	--
Buffalo	--	5	--	1	--	21	12	--	--	--	--	--
Duiker Blue	--	--	--	--	--	--	--	--	--	--	--	--
Duiker Red	--	--	--	--	--	--	--	--	--	--	--	--
Duiker Black	--	--	3	--	--	--	--	--	--	--	--	--
Eland	--	5	6	8	8	20	2	--	--	--	--	--
Elephant	--	--	--	--	--	16	--	--	--	--	--	--
Gerenuk	--	3	27	6	10	22	12	--	--	--	--	--
Forest Hog	--	--	--	--	--	--	--	--	--	--	--	1
Giraffe	--	--	1	--	--	1	--	--	--	--	--	--
Hartebeest (H)	--	--	--	--	--	--	--	--	--	--	--	--
Klipspringer	--	2	5	--	1	3	2	--	--	--	--	--
Kudu (L)	--	--	--	--	--	2	--	--	--	--	--	--
Kudu (G)	--	--	--	--	--	--	3	--	--	--	--	--
Leopard	1	5	21	11	6	9	3	--	--	--	--	1
Lion (M)	--	9	5	8	5	16	--	--	--	--	--	--
Lion (O)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (B)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (P)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (Pat)	--	--	--	--	--	--	--	--	--	--	--	--
Monkey (C)	--	--	--	--	--	--	--	--	--	--	--	--
Oryx (F.E.)	--	11	18	6	12	30	7	--	--	--	--	--
Oryx (B)	--	--	--	--	--	--	--	--	--	--	--	--
Ostrich	--	1	5	2	5	2	--	--	--	--	--	--
Reedbuck (C)	--	--	--	--	--	--	--	--	--	--	--	--
Rhinoceros	--	--	--	--	--	--	--	--	--	--	--	--
Suni	--	--	--	--	--	--	--	--	--	--	--	--
Topi	--	1	--	1	--	--	--	--	--	--	--	--
Zebra (G)	--	--	--	--	--	--	1	--	--	--	1	--

Appendix VII (continued)

NUMBERS OF ANIMALS SHOT IN VARIOUS CONTROLLED AREA BLOCKS, 1965

[illegible]

Appendix VIII

NUMBER OF VISITORS TO KENYA NATIONAL PARKS 1960-1967

	January June 1960	July 1960 June 1961	July 1961 June 1962	July 1962 June 1963
Nairobi National Park	59,298	119,321	103,144	121,432
Tsavo National Park (East)	3,374	7,327	6,700	10,846
Tsavo National Park (West)	4,759	12,067	11,055	18,370
Marsabit National Reserve	945	1,305	1,271	468
Mountain National Parks	4,727	11,050	5,426	4,918
Gedi National Park	2,488	8,333	6,846	7,946
Fort Jesus National Park	-----	<u>28,606</u>	<u>22,091</u>	<u>24,015</u>
TOTAL	75,591	188,009	156,533	187,995

Appendix VIII (continued)

NUMBER OF VISITORS TO KENYA NATIONAL PARKS 1960-1967

	July 1963 June 1964	July 1964 June 1965	July 1965 June 1966	July 1966 June 1967
Nairobi National Park	112,870	104,695	111,920	116,531
Tsavo National Park (East)	12,759	16,346	23,745	25,146
Tsavo National Park (West)	19,862	23,597	28,030	36,624
Marsabit National Reserve	86	-----	-----	-----
Mountain National Parks	7,050	5,609	5,735	8,835
Gedi National Park	9,050	9,185	11,354	12,424
Fort Jesus National Park	<u>22,134</u>	<u>27,609</u>	<u>44,246</u>	<u>45,834</u>
TOTAL	183,811	187,041	225,039	245,444

Sources: Kenya National Parks, Reports by the Trustees for 1963-1966, Nairobi, 1964-1967.
 Republic of Kenya, Economic Survey, 1968, The Government Printer, Nairobi, 1969, p. 96.

Appendix IX
LOWER KIKUMBULYU SETTLER SURVEY

Map Reference _____

Name _____ Location _____

Total Area Cultivated _____

Crops	Area	Yields	Amt. Sold	Where Sold	Income
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Cattle	Sheep	Goats	Chickens	Livestock Sold	Income
_____	_____	_____	_____	_____	_____

Charcoal Sold	Buyer	Where Sold	Income
_____	_____	_____	_____

Other Economic Activity _____

Total Cash Income Last Year _____

Structures in Homestead _____

Household Members _____

Age of Household Head _____

Appendix IX (continued)

Date of Settlement _____

Previous Residence _____

Residence of Father _____

Residence of Brothers _____

Reason for Migrating _____

Did relatives or neighbors also migrate? _____

Were present neighbors there at time of settlement? Did any come
after? _____

Land Elsewhere _____

Intend to Remain? _____ If move where to? _____

Other Observations _____

Appendix X

SURVEY OF CHARCOAL BUYERS

	Buyers Operating On Licence	Date Began Buying Charcoal	Bags Bought per week	Location of Station
1.	Individual	Feb. 1969	45	Thange
2.	Individual	Jan. 1967	70	Between Thange & Dwa
3.	Individual	Jan. 1968	70	Thange
4.	Individual	Nov. 1964	25	Thange
5.	Individual	June 1969	20	Chyulu Track
6.	Individual	Feb. 1965	50	Between Thange & Dwa
7.	Individual	Sept. 1968	60	Chyulu Track
8.	Individual	Oct. 1968	30	Between Thange & Dwa
9.	Company of 4	July 1968	20	Masongaleni Road at Main Road
10.	3 Individuals	Jan. 1966	50	Masongaleni Road at Main Road
11.	4 Individuals	July 1968	50	Ngwata Road
12.	Company of 7	March 1968	40	Masongaleni Road at Main Road
13.	Company of 5	April 1969	35	Masongaleni Road at Main Road
14.(a)	Company of 7	March 1969	8	Kambu
(b)	Company of 5	April 1969	6	Kambu
(c)	Company of 5	April 1969	8	Kambu
(d)	Company of 3	June 1969	7	Kambu
(e)	Individual	June 1969	<u>6</u>	Kambu
			600	

Appendix XI

ORIGIN OF KIKUMBULYU SETTLERS

Number of persons	Place of Origin	Place of Interview		
		at homestead	Kambu	Thange
103	Mukaa	15	20	68
68	Kikumbulyu	10	12	46
53	Mbitini	7	27	19
31	Kalama	3	22	6
25	Kilungu	8	8	9
19	Nzawi	2	9	8
9	Iveti	8	--	1
7	Mbooni	1	--	6
6	Kangundo	1	4	1
4	Okia	--	--	4
3	Makueni	--	1	2
3	Maputi	1	1	1
2	Wamunyu	1	1	--
2	Kiambu (Central Province)	1	--	1
2	Kisumu (Nyanza Province)	--	--	2
1	Mitabooni	1	--	--
1	Kitui	--	1	--
1	Loitokitok	--	1	--

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