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Conservation in Tropical Africa

with special emphasis on the activity of the International Union for the Conservation of Nature and Natural Resources (IUCN) and the World Wildlife Fund (WWF)

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The Era of pioneers

When explorers, big game hunters and missionaries travelled through Tropical Africa in the course of the last century they had no idea that destruction of nature and wildlife by man would ever become one of the major problems of that continent. Quite the contrary, they believed that wildlife would constitute a terrible brake against further human activity.

This was in fact the attitude of most of those concerned with administration and development of tropical Africa throughout the first half of this century. How could rational farming be envisaged when Elephants and Buffaloes would obviously devastate the fields? How could cattle breed successfully when they had to withstand the competition of grazing wild animals and when they were preyed upon by lions and other carnivores? Moreover, big game animals transmitted many diseases to livestock plus human infections. Numerous were those who advocated complete elimination of big game as a precondition for civilization and economic progress. Indeed, most African territories organised their game control services long before they had National Parks or game conservation departments. The game control services often operated by massive and indiscriminate slaughter of all big animals.

By the end of the first half of the 20th century many African territories, mainly those in the Western part of the continent, were almost empty of big game. Even in most parts of the Eastern plateaux and in Southern Africa the innumerable herds of hoofed animals decreased to a small fraction of their former numbers.

Nevertheless there were some farsighted men who reacted against these trends. Among the early ones were King Albert of Belgium, President Paul Krüger, and President Theodore Roosevelt. The first African National Park, the Parc National Albert in the Belgian Congo, was established in 1925. In 1933, on the initiative of the government of Great Britain, an international conference was convened in London,

discussed and signed a "Convention Relative to the Preservation of Fauna and Flora in their Natural State", known as the London Convention, 1933.

This convention provided encouragement to establish National Parks and Nature Reserves, for the protection of threatened species listed in an appendix[1] and to regulate hunting and traffic in trophies and skins. These regulations were mandatory, but the protection of threatened species and the establishment of National Parks and Nature Reserves were optional, at the discretion of the signatories. This was the best the promotors of the convention could achieve in face of the prevalent attitude of hostility against wildlife.

Even so, the London Convention, 1933, was an important milestone in African conservation. As early as 1934, Belgium established the "Institut des Parcs Nationaux du Congo Belge", a pioneering body in research and conservation. In 1938, the contracting parties met again in London and some statements on progress as a result of the convention were produced.

The second world war brought a temporary interruption to further progress, but the International Conference for the Protection of Nature, held at Lake Success, USA, in 1949 under joint sponsorship of UNESCO and the newly founded International Union of the Protection of Nature (now IUCN) asked for a new conference to achieve further steps. This was convened in 1953, in Bukavu, then in the Belgian Congo.

This conference proceeded with a revision of the London Convention and agreed on several amendments. Four species were added to the "A" list of threatened animals: the Pigmy Chimpanzee *(Pan paniscus)*, the Bontebok *(Damaliscus dorcas)*, the White-tailed Gnu *(Connochaetes gnou)* and the White Stork *(Ciconia alba)*. A recommendation was incorporated for the provision in all African territories of government bodies for management of wildlife resources. The conference asked also for elaboration of a broader convention on natural resources

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[1] The appendix was divided in an A and B list. We reproduce the original text although the taxonomy has been changed in some cases.

The species in the A list were: Mammals – Gorilla *(Gorilla gorilla)*, all Madagascar Lemurs (Chiromyidae), (Lemuridae), (Indrisidae), Aard Wolf *(Proteles cristatus)*, Fossa (Fossa) all subsp., Giant Sable Antelope *(Hippotragus niger variani)*, Nyala *(Tragelaphus angasi)*, Mountain Nyala or Bushbuck *(Tragelaphus buxtoni)*, Okapi *(Okapia johnstoni)*, Barbary stag *(Cervus elaphus barbarus)*, Pigmy Hippopotamus *(Choeropsis liberiensis)*, Mountain Zebra *(Hippotigris zebra)*, Wild Ass *(Asinus asinus)*, White Rhinoceros *(Rhinoceros simus)*, Northern Hartebeest or Bubal *(Bubalis buselaphus)*, Abyssinian Ibex or Walia *(Capra walie)*, Elephant *(Elephas africanus)*, Water Chevrotain *(Hyemoschus aquaticus)*. Birds – Whale-headed Stork or Shoe-bill *(Balaeniceps rex)*, Bald-headed Ibis or Waldrapp *(Comatibis eremita)*, White-breasted Guinea Fowl *(Agelastes meleagrides)* and the only plant – Welwitschia *(Welwitschia bainesii)*.

management, and issued, apart from those concerning the convention, several other recommendations on research and on rational use of wildlife.

Emergence of Policies

During the decade that followed the Bukavu conference, two facts of outstanding importance dominated the development of conservation in Africa. The first was the accession of most African territories to national independence and the second was the interest taken in African wildlife by international bodies developing a pattern of cooperation with the emerging nations.

Most previous activities in wildlife conservation in Africa had been entirely the responsibility of the colonial administration; it was difficult to anticipate changes in policies on wildlife which could result from independence. Would the African governments look at wildlife as a brand connected with their primitive past and as a hindrance to modern development; and would they therefore work for its early elimination? Or would they recognize a national heritage and an important economic resource and dedicate themselves to its wise management?

These questions were asked with anxiety by many conservationists throughout the world and the IUCN, at its general assembly in Warsaw, 1960, decided to give highest priority to cooperation with African states in order to assess the importance of African wildlife and to promote its rational management. This decision was implemented through a project called the African Special Project (ASP), organised by IUCN in cooperation with FAO, UNESCO and the Commission for Technical Cooperation in Africa / Scientific Council for Africa South of the Sahara (CCTA/CSA). It was financed for a large part by FAO.

The first stage of the project was designed to arouse interest at high government levels. An IUCN/FAO ambassador visited to this effect the African governments, inviting them to participate at a symposium on the Conservation of Nature and Natural Resources in Modern African States. This conference, the second stage of ASP, organised jointly by IUCN and CCTA, was held under the auspices of FAO and UNESCO at Arusha, Tanzania, in September 1961. It was attended by participants from 21 African and 6 non-African countries as well as 7 international organisations.

At Arusha, for the first time, all economical, social and cultural aspects of wildlife conservation and natural resources management in Africa were reviewed and their role for further development in the continent was examined. Thus, the proceedings of this conference, published by IUCN, became an important reference book for the emerging African nations, providing the background for rational natural

resources policies. In order to meet with the most pressing problems facing the government, much emphasis was laid on the economic importance of sound wildlife management. The vulnerability of soil and plant cover in many parts of the continent was stressed as well as the dangers of introducing indiscriminately into these areas agricultural and pastoral methods developed elsewhere. Indeed, such introduction has in many cases resulted very soon in drastic decrease of productivity whereas rational management of native wildlife in many instances not only contributed greatly to the conservation of soil, water and plant cover, but provided considerably higher returns in proteins. Moreover, wildlife has a high touristic potential and national parks as well as controlled hunting areas are among the most important sources of foreign currency for African nations.

The conference issued recommendations for the promotion of education and training, for land use policies avoiding over-exploitation of unsuitable areas and for the need for greater attention to the economics of resource development programmes. Technical and financial cooperation between governments and international organisations was suggested.

First Implementations

During the Arusha conference several African governments showed interest in the subjects discussed and asked for assistance from international organisations. Therefore, IUCN and FAO made consultants available to help individual interested countries to integrate their wildlife resources into their economic and social development plans and to suggest the most effective types of outside help. This became ASP stage III and in its framework the IUCN/FAO consultants visited 19 countries in tropical Africa during the years 1962 and 1963. A full evaluation of the situation and potential as well as a comprehensive set of recommendations was forwarded to the Governments and a final report was published in 1967 by FAO. ASP stage III has not only become the starting point for integrated natural resource and wildlife management policies in many African countries, it has also been followed up by FAO with a wildlife programme which has already now an impressive record of activity and achievements.

At the time this paper goes to press 4 major FAO wildlife management projects are in full progress in Cameroon, Kenya, Tanzania and Zambia, involving 20 experts. 10 further individual and associated experts are working with the governments of Botswana, Chad, Ghana, Kenya, Nigeria, Madagascar, Mali, Swaziland, Zaire and Zambia and major projects are in preparation in Cameroon, the Central African Republic, Dahomey, Tanzania and Zaire.

Certainly it is still too early to assess the impact of the ASP/FAO activities. Significant developments related to the programme have taken place in Botswana, Zambia, Kenya, Ghana, Nigeria, Sudan, Ethiopia and Zaire. It might also be mentioned that the number of National Parks in tropical Africa has increased from 35 at the time of accession of the countries to independence to 53 in 1970. Certainly ASP/FAO have played their part in this evolution.

One of the more important developments stemming directly from the Arusha recommendations and highly favoured by the FAO programme was the establishment within the 1960ies, of the wildlife management training colleges at Mweka (Tanzania) and Garoua (Cameroon), as a common achievement of governments, intergovernmental and non-governmental organisations. They have provided many African nations with a number of qualified experts playing an important part in the elaboration and implementation of wildlife policies.

During the same period UNESCO has given assistance to African states for conservation education and training. It has also financed several scientific surveys, among them two particularly significant ones in Ethiopia. In 1970, a Unesco Commission for Africa and a new post for a specialist in Ecology, were created by UNESCO.

The role of the non-governmental organisations has become a very important one. African associations, such as the East African Wildlife Society, are playing a large part, and a number of outside bodies have taken interest in the African Wildlife situation. Several American foundations have helped with research and conservation, among them the African Wildlife Leadership Foundation acting exclusively in this field and running a permanent office in Nairobi. The Frankfurter Zoologische Gesellschaft has collected German private contributions and brought much needed help in many critical situations. Most significant of the non-governmental efforts has been the common project operation of the World Wildlife Fund and IUCN. At the end of this paper a summary is given of the projects initiated or assisted in tropical Africa by WWF/IUCN under the sign of the now well-known Panda.

The elaboration of a new African Convention for the Conservation of Nature and Natural Resources has been another major development. Worked out in common by IUCN, FAO and UNESCO, at the request of the Organisation of African Unity (OAU), this convention has been signed by 38 African States in 1968 and has been in force since July 1969. It replaces the London convention but has a much wider scope, binding the contracting states to undertake a number of measures for the protection of soil, water, flora and animal life. It includes also provisions for conservation areas, research, education, integration of natural resources management into development plans and international cooperation. Like the London convention it also gives regulations for

specimens and trophies and has a list of species appended that must be protected in the contracting states. All these provisions are legally binding whereas in the London convention most of them were merely recommendations.

Outlook for the future

The last decade has brought significant progress towards rational natural resources policies and towards implementation of such policies in a number of African states. Does this mean that wildlife and natural resources are now better off than 10 years ago and that their future can be contemplated with optimism? Unfortunately there is no place for such complacency. In fact, simultaneously with the implementation of policies and their first favourable results in some areas, progressive degradation has continued and has actually increased over much larger areas. Human populations are growing rapidly and also occupation of hitherto wild areas and use of resources therein is growing. In opposition to a wide-spread belief, most of tropical Africa is rather poor in renewable natural resources and its overall carrying capacity for human populations is low. Therefore, it will achieve higher prosperity only if demographic increase is considerably slowed down within the near future. But even then there will remain urgent needs for increase in food production. This might lead to encroachment of agriculture and particularly animal husbandry on areas hitherto considered as marginal. It has, however, been shown in many instances that this makes such areas particularly vulnerable to destruction with little chance for recuperation. In their long term interests, African states will therefore have to direct efforts for food production mainly to lands already farmed but capable of producing higher yields. Marginal lands will then get more rational use, mainly for benefits derived from wildlife.

Such a concept leads inevitably to zonation: certain areas being developed for intensive farming, others for use of wildlife resources. To what extent wildlife is compatible with farming is still an open question. Certainly, a number of big game species must be eliminated from zones of intensive agriculture because of their destruction of crops and predation on livestock. Game is also in some instances a vector for disease which can be transmitted to livestock. Therefore this has led in several countries to indiscriminate slaughter of most larger species. Research has been initiated on this and needs still to be continued in order to determine the kind of game control needed for checking stock diseases. Certainly, even in farmed areas, maintenance of wildlife to the degree of compatibility would constitute a moral and economic benefit for human populations. Efforts must be undertaken to determine to what extent this is possible.

As to the marginal areas, much research and development is still needed to make the best use of wildlife resources. In the past, conservation areas such as National Parks and game reserves have mostly been delimited arbitrarily. Now, before more final limits between conservation and settlement areas are drawn, research programmes must ensure that the conservation areas are selfsustaining, i.e. that they are large enough and contain everything that their specific wildlife needs so that there is little pressure for emigration and a good guarantee for survival of biologically sound wildlife populations even in isolation from those in other areas.

Tourism for game viewing and, to a lesser extent, for sport hunting offers the highest prospects for deriving benefit from wildlife. But such exploitation also needs more research and careful planning. Tourist use of conservation areas cannot be increased beyond certain limits without damaging the quality of the experience for the tourists or even causing destruction of habitat and wildlife. Studies of these aspects are urgently needed in order to get more realistic evaluations of the economic potential of wildlife use by tourists. The turnover of wildlife tourism in tropical Africa is already huge and, in several countries, among the most important economic activities. It will, almost certainly, increase strongly within the coming years. Unfortunately, the larger part of the benefits is taken today by companies established outside Africa. Everything required should be undertaken by the African States in order to bring the "Lion's share" of the profits to the countries offering and maintaining the resources.

Game use for food for African populations has also a high potential. Since it has been discovered that in many areas, and mainly in those marginal for agriculture, game animals produce more meat than domestic livestock, successful pilot-schemes have been initiated for ranching selected game species and for cropping wildlife in natural areas. Techniques have still to be improved but it is already sure that this will be a highly rewarding use of wildlife.

To an increasing extent national parks and reserves are faced with population explosions of species such as Elephant, Zebra, Wildebeest and Impala, which destroy the habitat and thus degrade living conditions for themselves and for other species. To save the habitats from deterioration large numbers have to be removed. Using these excessive game populations as an additional food supply for local people must be the aim of economic park and wildlife management.

Other technical problems are specially related to woodland. Tropical timber is a very important resource but forests are cleared for agriculture, often with disastrous effects. Also techniques for timber management are still insufficiently established. Today tropical timber exploitation is in many cases spoilation and destruction of resources. Much

more research and development is needed to know how to use tropical forests in a rational way. Forests have not only to be looked at from the point of view of timber production but also for their importance in conservation of water and prevention of soil erosion. Unfortunately a very large part of this resource has already been irretrievably destroyed but there is still ample scope for African governments to introduce ecological forestry studies and wise long term economical management.

A number of political and traditional problems will also need to be overcome in order to assure the future of wildlife and its best use for African states. In many instances relocation of human populations has been and will be necessary to establish the most adequate zoning between conservation and settlement areas. Although this is in most cases to the economic advantage of resettled populations it often causes political and social difficulties. Often local populations are opposed to conservation areas and the results are illegal encroachment, poaching and even claims for abolition of parks. This has for instance recently led to strong pressure on a part of the world famous Serengeti Park. Under present conditions local populations generally get few or none of the benefits of nearby conservation areas. Therefore their hostility is understandable. It is urgent to establish an equitable sharing of normal and economic profit from conservation areas between central governments and local populations.

A much nearer link needs to be established between politicians and ecologists. The best ecological management programmes have little prospect of being led to implementation if they do not take into account political and social conditions. But, on the other hand it is even more necessary for politicians to accept advice from ecologists for the establishment of their programme. Indeed, politics established against ecological advice lead to impoverishment.

The future of African nations will not only depend on economic development. African wildlife and scenery have formed and influenced African tradition and mentality in the past and these interrelations cannot be broken in modern times without creating an enormous cultural and spiritual vacuum. Economical development, therefore, will have to go along with a moral development, with a faith in the values of Africa, and with respect towards the traditions of its peoples and cultures.

For the developing African nations wildlife remains, therefore, a unique asset, something all Africans can be proud of because it is part of their history, and also because no other continent has anything comparable. There are signs that many Africans are well aware of this spiritual richness. The recent success of the Wildlife Clubs in Kenya high schools is a striking example of this. Wildlife conservation must therefore be incorporated into the countries' development plans, and

we can be certain it can only have a bright future in Africa if the African people want, themselves, to preserve wildlife, and if they want it for their own spiritual and economical benefit.

In industrialised countries there is a widespread feeling that the establishment, development and management of parks and reserves should be the responsibility of the Africans alone, since they receive an "enormous" income from wildlife tourism. It has been shown previously that this is not really true. Furthermore, African wildlife constitutes to an increasing extent a significant resource for recreation for people from highly developed countries. It is of great value for science and research and most industrialised countries to send their teachers, students and research workers to tropical Africa to gather experience from the unique diversity there of ecosystems and animal species. It is, therefore, obvious that the outside world also has to cooperate in maintaining African wildlife. Developed countries must also recognise that, if wildlife conservation is to be of benefit to Africa in the long run, its initiation involves many economic and technical difficulties. The emerging African nations will sooner or later overcome these difficulties entirely by themselves, but some do not yet have the means to deal with all of them. Therefore, for some considerable time the outside world must still give them the technical and financial help they require.

Projects and Conservation Programmes supported by WWF in tropical Africa

When the WWF was founded in 1961 the international responsibility for African wildlife was accepted as a fact and consequently fund raising activities were started to aid projects on conservation of species, and the establishment, support and maintenance of national parks and reserves, and by provision of equipment for ranger forces and conservation education. Until now WWF has supported 98 projects in tropical Africa. The brief description of these may give an insight into the conservation programme followed through by this organisation during the first 10 years of its operations.

Botswana

The *Moremi Wildlife Reserve*, covering about 530,000 ha, was created in 1963. It includes part of the Okavango swamps which constitute one of Africa's largest inland deltas and are of great ecological

interest. A network of multitudinous channels covers about 1,750,000 ha during inundations and helps to provide one of Africa's last wild and rich wildlife habitats. WWF was effectively involved in the establishment of this Reserve by financing an ecological survey on which the development and management of the area was largely based. Since 1965 increased foreign aid from FAO and other sources has enabled the Game Department to improve the reserve considerably.

The *Chobe National Park,* the best conservation area in the country, lies southwest of the Moremi Wildlife Reserve and covers an area of about 1,050,000 ha. Until 1969 both reserves were lacking access and game viewing trails. Following a request of the Department of Wildlife and National Parks WWF provided a grant for obtaining a road building unit to open up attractive areas for tourism. The revenue from this will create the desire to sustain it and so will become the best factor to protect the area from other competitive forms of land use.

The two dominant herbivores in Northern Botswana are elephants and buffalo. They present urgent management problems for the region as a whole and for the Chobe and Moremi regions in particular. In 1972 WWF started to support a research programme in this area to provide information for a rational management of these species in Botswana, and to link this with that of the nearby Wankie National Park in Rhodesia.

There is no doubt that assistance from WWF has influenced the development of conservation in Botswana and has stimulated other organisations and the government to maintain and improve existing parks and reserves effectively.

Chad

The Chad Government has established some of the most valuable wildlife reserves in the Sahelian zone where protection is given to Oryx and Addax antelopes, two of Africa's most endangered ungulates. In 1968 WWF donated a light aircraft to the park authorities to improve supervision and management of the parks and reserves in this area. This new control facility has reduced poaching considerably. Encouraged by WWF support, the Government has now established a new reserve for Addax and Oryx.

Ethiopia

The Ethiopian highlands and parts of the lowlands are perhaps the most unspoilt nature regions of Africa. Due to this, the unique land-

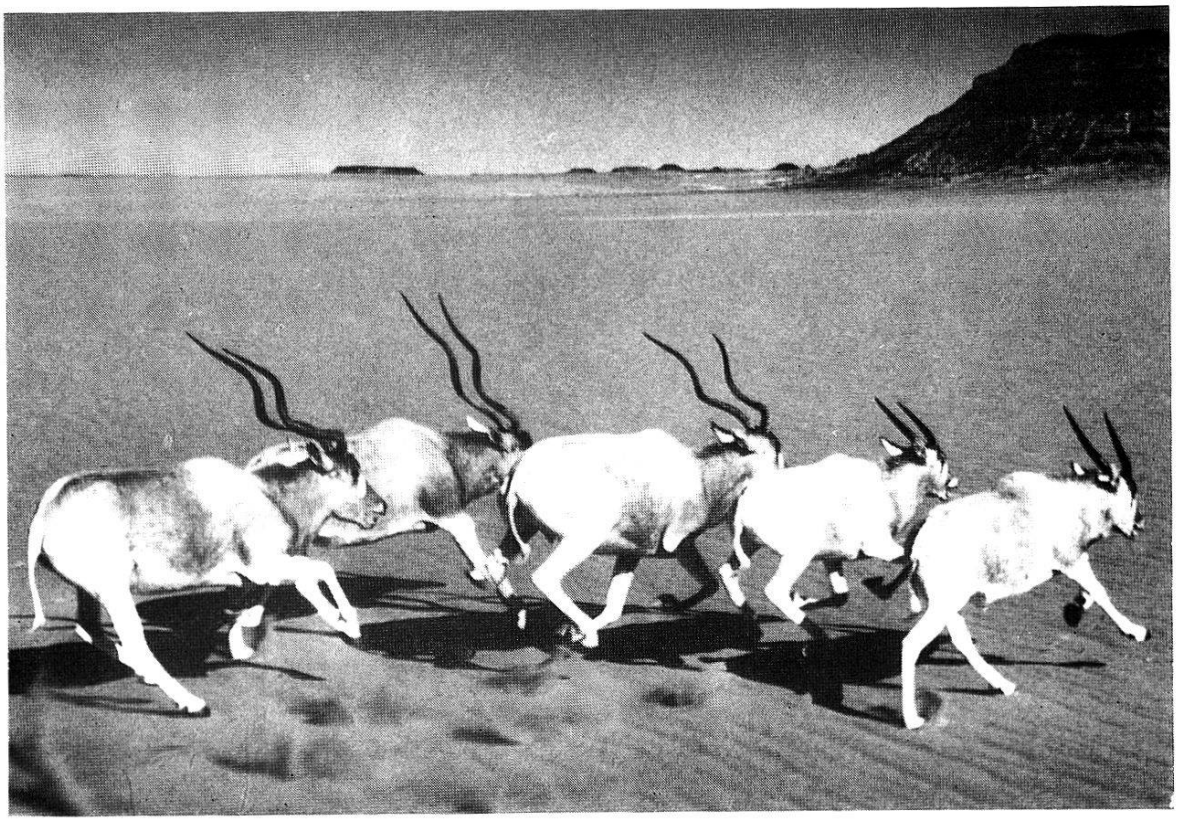

Fig. 1. Addax in the Chad, one of the most endangered antelopes of the Sahelian Zone. (Photo F. E. Blanc – WWF.)

scapes and the interesting endemic flora and fauna, the country has received much assistance in the field of conservation from the WWF and various other organisations.

The most spectacular area, the *Simien Mountains National Park* was established in the highlands with WWF assistance. WWF supported an expedition to the area in 1963 to produce a basic development plan. Since 1966, ecological research programmes were financed to establish the biology of the Walia ibex, an endangered endemic species of this region, as the basis of appropriate conservation action. WWF also assisted investigations into habitat conservation there and supports a project concerning erosion control, soil conservation and strengthening the ecosystem of this National Park. In addition WWF provides funds to maintain a permanent warden for the park who is responsible for maintaining agreed conservation and management plans.

WWF also supported the establishment of the *Awash National Park* because of its variety of wildlife, its accessibility and its potential for revenue from tourism. A permanent headquarters, several outposts, 150 km of roads, an airfield and tourst facilities were built. WWF helped to engage a qualified park warden and provided equipment such as vehicles and generating plants.

In addition to these two major programmes several research and

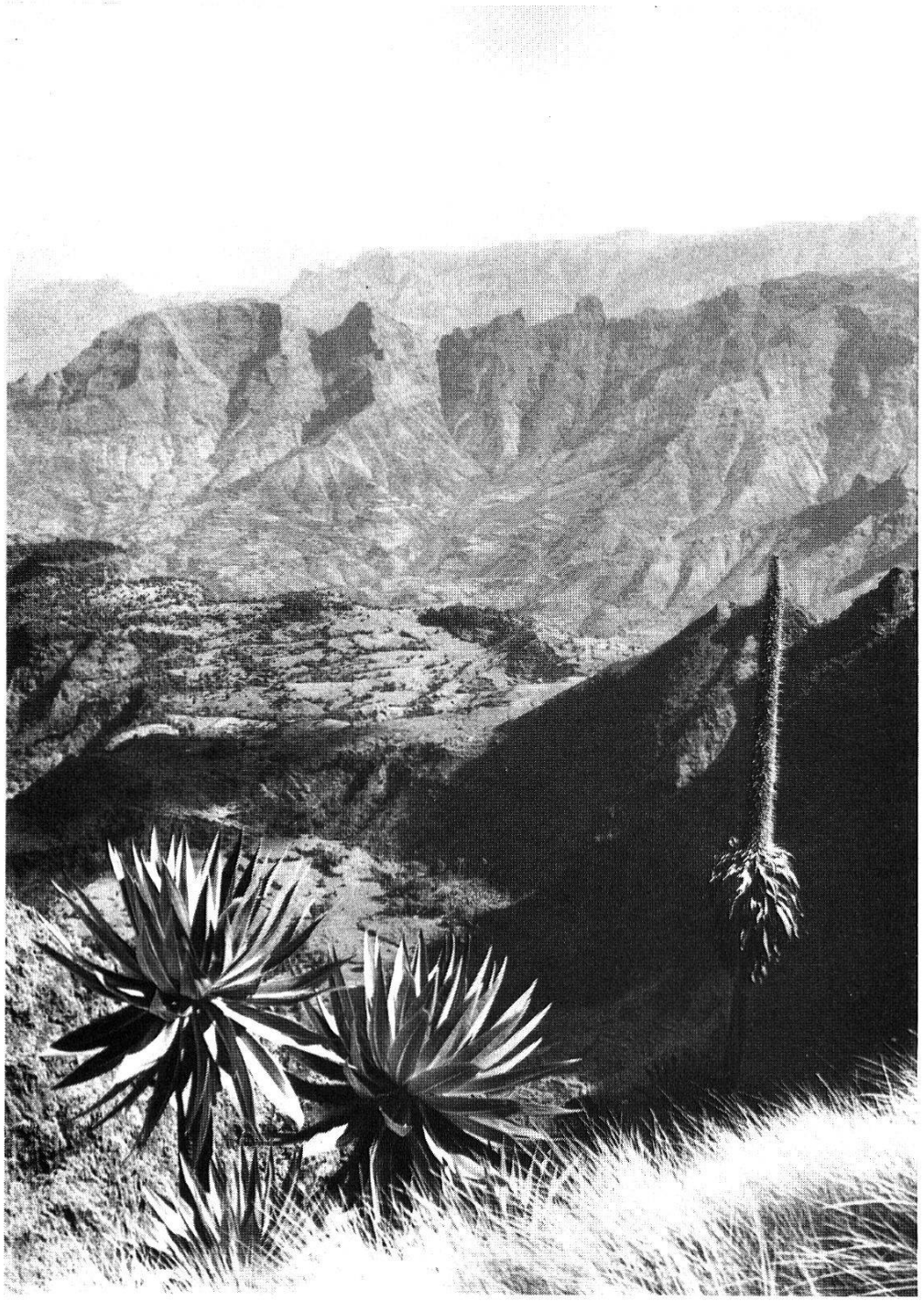

Fig. 2. Simien Mountains National Park, Ethiopia, the main habitat of the Walia Ibex and other endemic species. (Photo F. Vollmar – WWF.)

conservation projects were financed relating to preservation of endangered plants (Yeheb nut bush), habitats (rain forests) and threatened species such as the Mountain nyala, the Somali and the Nubian wild ass. At present WWF is assisting Ethiopia to establish a reserve in the Danakil region to save the last 3000 Somali wild asses and the few remaining Nubian wild asses.

Gambia

With about 1,036,000 ha, Gambia is one of the smallest countries in Africa. For conserving some of the remaining wildlife the government established the Abuko Nature Reserve. The reserve covers 61 ha and is situated 20 km from Bathurst, the country's capital. To protect the reserve against illegal encroachment WWF donated funds for fencing.

Ivory Coast

The Tai Forest Reserve is part of the last intact lowland tropical rain forest on the west side of the Dahomey Gap. It is a unique habitat for several endangered species such as the Pigmy hippopotamus. Until recently the reserve was naturally protected by its remoteness from large urban centres. But recently a deep sea port was built in San Pedro and new access roads have opened up the areas, and timber companies have started to exploit and ruin the surrounding forest. Urgent action was therefore required to improve the conservation status of the reserve. Following a governmental request, WWF sent an ecologist to the Ivory Coast to survey the area and to advise the local authorities on developing the reserve into a national park.

Kenya

Kenya is one of the few African countries where nature conservation has already become an effective element for promoting the country's economical development. Kenya has realised that wildlife is an important natural resource which must be managed and looked after with care. The government invests considerable funds in conservation, but international support is still needed. Since 1963 WWF has promoted more than 30 projects in the country, including emergency actions and long-term development programmes. It has helped educational projects (see below), the Kenya National Parks generally, and the establishment and maintenance of various parks and reserves, such as:

The *Shimba Hills,* a 16 km long range largely forest covered with areas of open glades. The glades form the habitat of Kenya's most important population of sable antelope, which has become very rare in the other parts of the country. After an initial ecological survey sponsored by WWF and the provision of initial equipment, the hills were declared a nature reserve and are scheduled to become a national park.

The *Ngong Hills* are situated just south of Nairobi. As part of the

Masai Land Unit, these hills could not be added to the Nairobi National Park. To save the area from illegal encroachment by agriculture and livestock, WWF provided funds to fence the reserve.

The *Mutomo Plant Sanctuary*, the first of its kind in the whole of Africa is situated on a rocky outcrop which partially affords natural protection from the pervading goats and other domestic animals. Over a hundred species of trees, shrubs and succulents have already been identified. The reserve was established thanks to funds and technical assistance provided by WWF.

Lake Nakuru is one of the greatest ornithological spectacles in the world, and the first National Park in tropical Africa to be established primarily for birds. The lake was declared a National Park in 1968 and harbours notably the greater flamingo and sometimes over a million of the lesser flamingo plus hundreds and thousands of other birds of over 400 species.

In 1970 the *Baharini Wildlife Sanctuary* was established north of the lake with the objective of protecting and developing this unique wildlife habitat, an aim which was supported by WWF financially and morally.

Since 1971 the Kenya Government, other organisations and the World Wildlife Fund are raising funds to buy adjacent farmland, because it has become clear that this will be the only way of conserving this spectacular bird habitat:

The park is primarily an aquatic habitat, not terrestrial, and as such is dependent on the water catchment basin outside the Park boundaries. Its future may depend entirely on anti-pollution measures in this area. The almost undestroyed landscape and the concentration of birds are the reason why the Park is the second most visited national park in Kenya. But the mounting pressure of agriculturists and stock breeders on the surrounding habitat of the lake will result in habitat deterioration and wildlife extermination if no counter measures are taken. Land around the lake at least 1 mile back from the water's edge must be included in the Park to establish a buffer against human encroachment. This proposed extension will add about 10,683 ha (26,707 acres) of farmland and include the most important watersheds within the park area.

The *Saiwa Swamp* is the only habitat of the Sitatunga antelope in Kenya. The population is estimated to be between 80 to 100 animals. Because of their specialised requirements the animals are particularly vulnerable to habitat destruction. The area has been excised from the surrounding settlement scheme, and the Ministry of Tourism and Wildlife is taking steps to gazette the area as a National Park. In 1970 WWF provided fencing material to save the area from agriculture and stock breeders.

The *Uaso Nyiro Game Reserve* provides the only territorial protection given to Grevy's zebra, which is rare in Kenya. The Samburu tribesmen initiated a project for the extension of the reserve. WWF provided funds for the construction of watering points for cattle, so that the existing water in the proposed new extension will not be required for domestic livestock.

Mount Elgon National Park is situated on the border between Kenya and Uganda. The Kenya side of the mountain was made a nature reserve about fourteen years ago, and was declared a National Park in 1967. It harbours elephant, buffalo, leopard and a variety of forest duikers of which the taxonomy is not yet fully understood. WWF provided funds for the development of the park and to finance a much needed anti-poaching team.

The *Masai Mara Game Reserve* was established in 1961 and covers an area of 151,300 ha. A central area of 64,750 ha is fully protected and run as a National Park. It represents one of the most valuable wildlife areas in Kenya. To avoid erosion damage which has been caused elsewhere by cars being driven all over the countryside, roads to which the cars are confined, had to be built. WWF provided funds for the purchase of road-making and fire-preventing machinery.

The two National Parks which received most support over several years are the Meru and Tsavo.

The *Meru National Park* is situated about 280 kms northeast of Nairobi and covers an area of 103,600 ha. It was established as a reserve in 1960 but with WWF support it was upgraded to a National Park in 1967. It is mainly bush country harbouring a wealth of wildlife. To develop the reserve and open it up to the public WWF supported the development since 1965. Existing roads were improved, new ones built and better accommodation for visitors and guards were constructed. WWF donated a Piper Super Cub and contributed to the purchase of a Cessna 180. Both planes are used for conservation and research purposes. In addition, WWF provided grants to purchase several vehicles (trucks, landrovers), which proved to be of inestimable value to the park personnel. In 1965 WWF financed the re-introduction of 6 square-lipped rhinoceros from South Africa. The specimens settled down well and have already produced some young.

The increase of elephants in the *Tsavo National Park* has created a major management problem for several years. In 1962 between 16,000 and 20,000 were using the Park which covers an area of 2,080,000 ha. Due to this overpopulation, destruction of forest and woodland became serious. In 1965 the Kenya Government started a research programme on this elephant population with funds received from the Ford Foundation. Concentration of elephants and the changes and growth of vegetation were studied to formulate an appropriate

conservation and management plan. WWF contributed to this project by donating an aircraft for aerial surveys and 2 vehicles in 1970–1972 for helping ground research. In 1963 thirty young Hunter's hartebeest were transferred from Bwa on the Tana River to the Tsavo National Park. Only about 1,000 of these animals were supposed to exist, and their survival was threatened by a development plan. After the release of the animals in Tsavo National Park no signs of them could be found for almost two years. In 1966, however, a small herd consisting of 7 animals, four of them juveniles were seen, so it seems that "Operation Antelope" may have been successful.

Further, WWF support was given to projects of general interest, for instance:

- *Provision of aircraft.* Reports from many African countries clearly show that aircraft are essential for all branches of wildlife management when large areas are involved. They are necessary to make effective observations of animal concentrations, movements, herd structure and distribution, as well as to control poaching, fires and to transport personnel and equipment. Beside the donation of a Piper Super Cub and financial help in purchasing a Cessna 180 for the Meru National Park, WWF contributed funds for another three aircrafts for the Kenya National Parks. These aircraft are now fully occupied and have proved to be of value, especially in anti-poaching campaigns and the control of bush fires.
- *The Tigoni Primate Research Centre* was inaugurated in 1958, and is working now under the leadership of Dr. L. S. D. Leakey. The work of the centre has thus far been concerned with taxonomic problems of East African Primates; growth studies and variations with age and sex, as well as with food habits, oestrus cycle and breeding behaviour and with breeding experiments. WWF supported some of the research programmes of this centre.

Madagascar

The exceptional scientific and cultural importance of Madagascar stems from long isolation from Continental Africa. For 50 million years its fauna and flora evolved in insular segregation and the survival of her highly specialized fauna depends largely on the existence of the endemic flora there.

Habitat destruction is the main reason here for decline of most wildlife species, and this in turn is largely due to the rapid numerical increase of human population. Since the Second World War, much of the indigenous forest has either been replaced by exotic plantations or

destroyed by uncontrolled felling and burning to create more area for cultivation and for accomodating ever-increasing herds of domestic cattle. Nine-tenths of the original vegetation has disappeared. Although 2 national parks, 12 "réserves naturelles intégrales" and several forest reserves were established, some rare animals are now not represented in any of them. Some of the reserves resemble small oases standing out in contrast to the denuded zones around them. They are particularly difficult to protect and some are threatened by commercial logging.

To remedy this critical situation and to assure the survival of the fauna of "Lemur-Island", IUCN/WWF have undertaken an overall conservation programme since 1967. In co-operation with the Malagasy Authorities, they try to reinforce the protection of the existing parks and to create new ones. To help the public and the government towards a greater involvement in the conservation of Madagascar's natural resources, an "International Conference on the Rational Use and Conservation of Nature" was held at the University of Tananarive in October 1970. Specialists from all over the world met with the authorities of Madagascar: a draft plan of action was elaborated, follow up projects were formulated and action was taken to implement them. To assist with this, IUCN established a Madagascar Project Committee which includes Malagasy members.

One of the most interesting of Madagascar's fauna is the Aye-Aye but it is also the most endangered. The animal had not been sighted since 1933 and was thought to be extinct until Dr. J. J. Petter rediscovered it in 1957. To safeguard the few remaining specimens an emergency programme was set up and supported by WWF. A systematic search for specimens was undertaken and 8 animals were captured. They were translocated to the reserve of Nossi Mangabé and released. This small (520 ha) island of Nossi Mangabé still retains its natural vegetation. It was proclaimed a reserve by the Malagasy Government especially for the Aye-Aye emergency programme. WWF provides funds for the management of this island.

Malawi

WWF assistance has been given to anti-poaching and to the development of reserves. In 1965 a Landrover was donated to fight poaching in the Lengwe Game Reserve, a sanctuary for the rare Nyala antelope in Southern Malawi. The Nyala reacted quickly to protection and became accustomed to humans in the Reserve, and thus is now an aid to tourism. In 1966 the vehicle was moved to the Nyika Plateau to help in the establishment of this National Park.

Within the framework of an overall research and management programme WWF also donated a Landrover and a motorised grader for the construction of fire breaks in the Kasungu, Lengwe and Nyika National Parks and for building and maintaining roads in these parks.

Rhodesia

Conservation of Rhinos has been the main feature of WWF assistance in this country.

At the beginning of this century White Rhinos were extinct in Rhodesia. But in the Umfolozi Reserve in South Africa their number was increasing. The Natal Parks in South Africa offered some for re-introduction in Rhodesia.

WWF financed the catching operation and transport so that in August 1962 "Operation White Rhino" started. Eight animals were captured, four being released in the Matopos National Park and the others in the Kyle Dam Game Reserve. They became accustomed to their new surroundings in an astonishingly short time so that WWF's "Operation White Rhino" is considered a model of international co-operation and successful re-introduction.

A second operation was the translocation of 43 Black Rhinos from the Mfurudzi and Ruya areas where they were constantly threatened by poachers, to the Gona-re-Zhou Reserve which is comparatively safe. Unfortunately two animals died during the catching operation but the remaining 41 have settled successfully.

WWF also supported investigations dealing with the effect of the inundation of the Zambesi valley by the building of the Kariba Dam. Dr. G. Child carried out a research programme, first begun in 1945, continued during the inundation in 1958 and completed after the area had filled.

Rwanda

One of the most endangered wildlife species of tropical Africa is the Mountain Gorilla. These animals are endangered by poaching and habitat destruction caused by timber cutting, agricultural development and livestock grazing. Miss D. Fossey, who previously worked on the Mountain Gorilla in Zaire (Congo) extended her work to Rwanda in 1971. Apart from her scientific work she is an active conservationist and with funds from WWF has succeeded in improving the guard system of the Volcanoes National Park as a result of which poachers who killed 3 gorillas have been arrested. Her work for conservation of this species is of extreme importance.

Tanzania

Most of WWF's assistance to tropical Africa has been given to East African countries, where the last great refuges and the most spectacular concentration of wildlife are found in the vast grasslands of Tanzania and Kenya. Tourism is well developed in these countries, and is probably the main reason why parks and reserves of these states are better known than those in other parts of Africa.

There is no doubt that the *Serengeti National Park* is one of the most famous conservation areas in Africa. Several organisations assisted the Tanzanian Government in consolidating and managing this unique Park and WWF also played an important role in building it up. The Park covers 1,295,000 ha and contains one of the last and certainly the best surviving great concentrations of large land mammals in Africa with over one million ungulates.

Unfortunately, when the boundaries of the National Park were laid down in 1959, little was known about the great animal migrations which are a unique feature of the ecology of the Park. As a result, parts of the annual migration route were left outside the boundaries of the Park. The most important of these omissions lies to the northwest of the Park and is known as the Ikoma area. The herds pass through this in the dry season between August and September, and it was here that a lot of poaching occurred. In collaboration with the government, a scheme to evacuate the Ikoma area and to resettle the people outside of the main path of the migrations was worked out with the help of the WWF in 1964 and 1965. Another important area, the Lamai Wedge, lying on the north bank of the Mara river and covering about 900 km^2 was purchased with WWF help and added to the Park in 1966. Unexpected problems arose in 1971/72, because settlers entered this part of the Park with their livestock.

In addition to land acquisition, assistance was given to research projects concerned with management of the area. With WWF aid, veterinary studies were carried out which aimed at investigating the role of diseases in the control of animal numbers in the ecosystem of the Serengeti and to find out whether wildlife is a reservoir of diseases harmful to domestic stock. A photo-ecological project has been supported since 1969. It aims at long term plant-ecological monitoring by means of large scale aerial photography and analysis of changes in the vegetative cover. In a first phase the landscape of Serengeti was classified and in a second phase representative sample plots were established which will be under controlled observation for the next 70 years with the help of infra-red aerial photography. WWF also provided financial support for the flight training of an assistant chief warden.

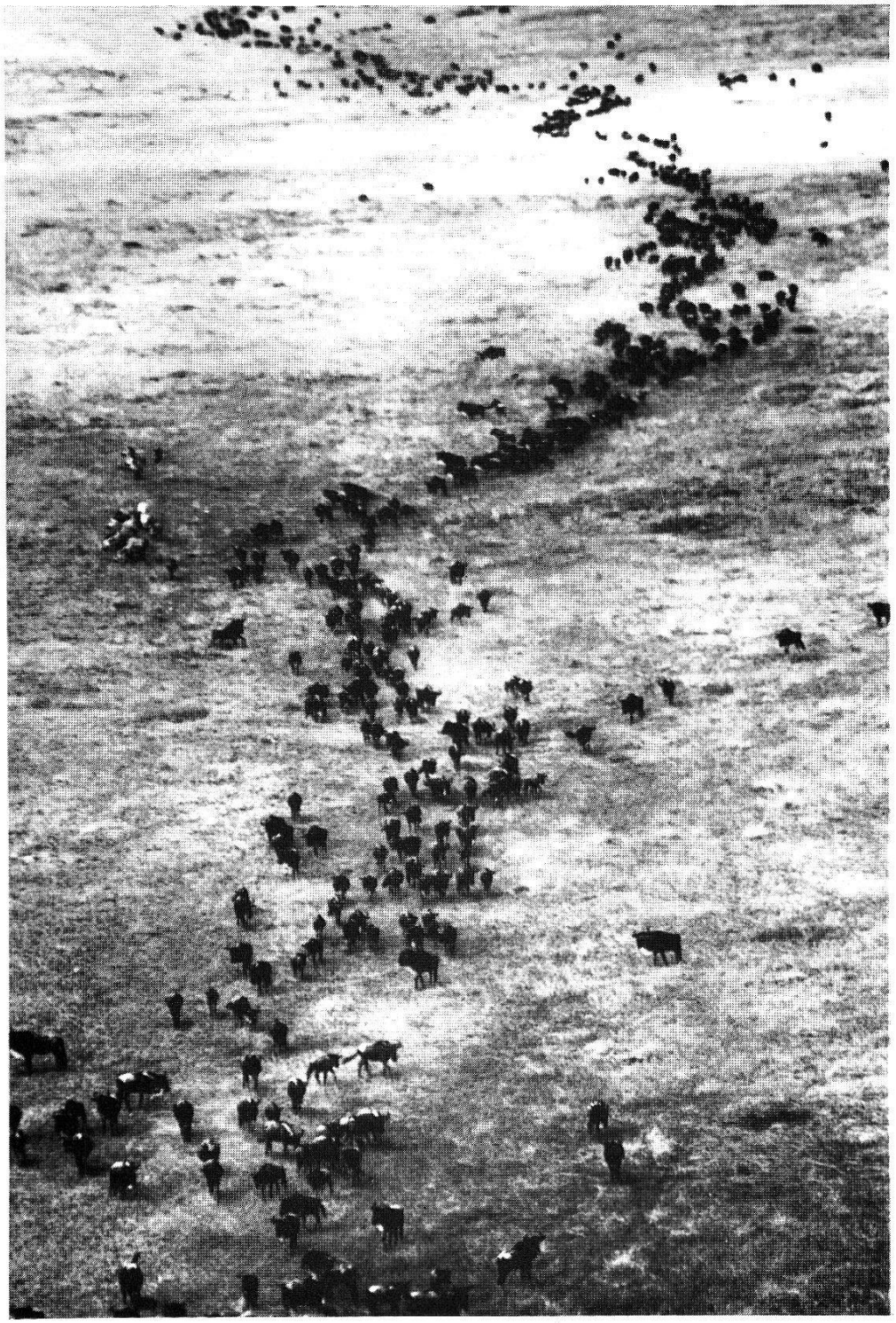

Fig. 3. Migrating wildebeest in the Serengeti National Park, Tanzania. Parts of their migration routes are outside the Park. To improve conservation of big game new park boundaries have to be established. (Photo N. Myers – WWF.)

Assistance was also given to extending the *Arusha National Park*. In 1962 funds were contributed to purchase parts of the former Momela Farm. Together with other land this was added to the Ngurdoto Crater National Park. In 1964 the forest land between Momela and Ngurdoto was also included in the Park. When further substantial portions of

the Meru Forest Reserve were taken over by the National Parks the whole area was renamed Arusha National Park in 1968.

WWF contributed to the development of the Park by providing funds for roads, housing for guards, fencing, and a programme for the rehabilitation of natural vegetation by carrying out a programme of bush control with the aim of improving the natural pastures and encouraging regeneration of trees.

Apart from these two major areas, several other conservation programmes dealing with management of parks and reserves were supported throughout the country. In 1967/1968 a dam was built in the centre of the Mkomazi Game Reserve where permanent water places were situated only at the edge of the Reserve, thereby causing serious habitat destruction by localised overgrazing. Now water is available throughout the year and is better distributed.

Machinery for the construction of firebreaks in parks and reserves was also provided and help was given to the government in employing European staff for assisting in the management of national parks.

Uganda

After independence in 1962 Uganda established its third National Park in the Kidepo Valley, thus increasing the area devoted to wildlife conservation considerably. However, it soon became obvious to the Director of the National Parks that poaching was increasing in all parks and was threatening their future. The country was unable to solve this problem alone and requested WWF to support the build-up of an antipoaching unit and to provide assistance for the full time use of a light aircraft. WWF helped these projects over several years. Poaching was reduced considerably and other illegal activities such as grazing and agriculture in these areas were largely stopped.

Other anti-poaching activities were aimed at conservation of the highly endangered northern subspecies of the square lipped Rhinoceros *(Ceratotherium simum cottoni).* A guard system was established and rhinoceroses were transported from the Madi District to the Murchison Falls National Park where they could be protected more effectively. During 1961 and 1965 twelve specimens were moved and in 1965 the birth of the first calf confirmed that the operation was successful. Since 1965 the Government of Uganda has continued the scheme independently.

Zaire (Congo)

Since its independence in 1960, Zaire became the custodian of Africa's oldest National Park, the Albert National Park (now Virunga

Fig. 4. Family of Mountain Gorilla, Virunga National Park, Zaire. Conservation of rainforest biotopes and its wildlife is of utmost priority in Tropical Africa. (Photo J. Verschuren – WWF.)

National Park). Unfortunately the park is located in a region which has suffered badly from recent insurgent activities. Only the heroic fight by Congolese park guards against poachers and invaders, the helpful attitude of the Congolese Government and various interventions of the WWF have saved the park from disaster. WWF grants enabled the guard system to be reinforced so that illegal activities could be controlled.

Among other acute problems the situation of the mountain gorilla still needs strong action. WWF has therefore provided funds to build up a new guard post in the habitat of this species. The area is difficult to control and until now has been invaded by stock breeders with their cattle. Browsing and trampling badly damaged the forest and was mainly responsible for the decline of the species. By supporting a similar project in adjacent Rwanda, WWF contributed considerably to the conservation of this endangered animal. The basis for co-ordinated WWF activities in Zaire and Rwanda for this conservation of the Mountain Gorilla was established by a research programme in both countries during 1968.

Zambia

WWF assisted Zambia's very active Game Department in building up and improving some of Africa's most valuable conservation areas.

In 1962 about 40,000 ha were purchased to establish the Lochinvar Game Reserve. This area abounds in wildlife and is world famous for the large herds of the Kafue Lechwe *(Kobus leche)*. It is situated in the vicinity of the capital of Zambia and has enormous tourist potential.

WWF's next most important support concerned anti-poaching activities and research projects, the latter mainly to put management of parks and reserves on a sound scientific basis. A light aircraft was donated in 1966 and was based in the Kafue National Park. In 1971 a helicopter was provided especially to fight poaching in the swampy areas of the Bangweulu, Kafue and Mashi. Operations have been very successful and poaching has been reduced considerably. In addition, special "air cats" (small hydrofoils) were donated in 1972 to combat poaching on the last big population of Black Lechwe *(Kobus leche smithemani)* in the Bangweulu swamps.

Education

To an increasing extent Africans alone must become responsible for the maintenance and management of their wildlife resources. To this end, all possible help should be given to provide initial organisa-

tion of facilities to build up schools of wildlife management for the training of senior staff for parks and reserves. So far, two schools have been developed for this purpose: the College for African Wildlife Management at Mweka in Tanzania, and the School of Wildlife Specialists in Garoua, Cameroon.

The college at Mweka was established by the Government of Tanzania with the assistance of the United Nations in 1963. The WWF aided the successful launching of the college and provided fellowships for students. The college provides basic wildlife training for senior staff of the national parks and game departments of English speaking African nations. A two year diploma course combines lectures and laboratory work with practical experience in the field, and a one year certificate course is designed for middle grade wardens and assistants. WWF provided funds for the purchase of 4 vehicles, for college equipment and for building up the college library.

At Garoua in the Cameroon a training centre in wildlife management for French speaking African countries was established by the local government in cooperation with the FAO. WWF gave financial assistance for the erection of buildings and is at present raising funds for a scholarship.

Good management of parks and reserves is not the only essential for the future existence of African wildlife. This can be assured only if Africans begin to appreciate their wildlife and to consider it as an integral part of their national heritage. The best way of building up this awareness is by educating young people to appreciate conservation. The recent development of Kenya Wildlife Clubs is a first step in this direction, and their success proves that the youth of this country is interested and prepared to accept wildlife conservation. They accept this now not only from the economic point of view, but also as a spiritual asset of their country.

Begun in late 1968, the Wildlife Clubs have grown from a 12-school interest group into a National Association of 75 clubs for secondary school and teacher training colleges throughout Kenya. This is a powerful development which has been supported effectively by WWF. During the last years WWF has donated books for the Clubs' library plus a mobile library unit to provide the clubs throughout the country with the necessary educational facilities.

WWF has also supported the establishment of a now extremely popular animal orphanage at one entrance of Nairobi National Park, where care is taken of young wildlife found deserted or injured. This place is most valuable as a means of education, developing a feeling in the African population, among the youth in particular, of love for wild animals, and a regard for them not just as a resource of food and foreign exchange.

WWF also financed publications aiming at conservation education, such as guides and a paper on "The distribution of some larger Mammals in Kenya".

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