

of the road from the Luangwa Bridge to Chichele was broadly controlled by the bridge sites selected by the engineers to cross the Mushilashi and Katete rivers. The access road was aligned by the Department as far as possible on freely draining sand to save on construction costs. Free-draining sandy soils usually carry dense vegetation and because this would hinder game viewing spur roads to the main access road were constructed with the limited funds available.

In accordance with the tourism plan and Government policy the Department staff moved out of the Park in 1971 to a new complex adjacent to the proposed Chinzombo Lagoon Lodge. Before the vacated buildings at Old Mfuwe could be demolished, ZNTB appealed to the Minister for permission to use them for staff of Mfuwe Lodge. Greatly to the surprise and annoyance of the Department, ZNTB obtained the Minister's approval. In the course of time, the Department reoccupied the by now dilapidated Old Mfuwe and in 1990 built a new staff rest house, thus negating one purpose of the Park entry road which had been specifically aligned in 1970 to present an outstanding view of one of the most attractive lagoons in the Park.

All these developments were financed by Government under the First and Second National Development Plans and designed by Government staff with the Consulting Engineers, initially Edwards and Burrows, subsequently Pettit and Partners, both Lusaka based companies. However the Department itself had been restricted in both capital and recurrent funding since 1972. The Masumba airport was opened in December 1975. The proposed Lodge on Chinzombo lagoon was not built, although the access road to it was completed and the site continues to be used by the Department. With this major exception subsequent developments have taken place within the original broad framework although there has been less expansion away from Mfuwe than was originally planned, and six operators are now clustered around the bridge. There has been no growth in the use of other areas of the Park for what might be described as 'non-wildlife' tourism. Thus, although there are spectacular hill walks with seasonally attractive vegetation, beautiful clear streams, interesting examples of fossilized trees and reptiles in or near to the Park, and historical routes such as that of Livingstone, the tourist is rarely given the opportunity to see them (Dunlapp 1973; Legg 1974).

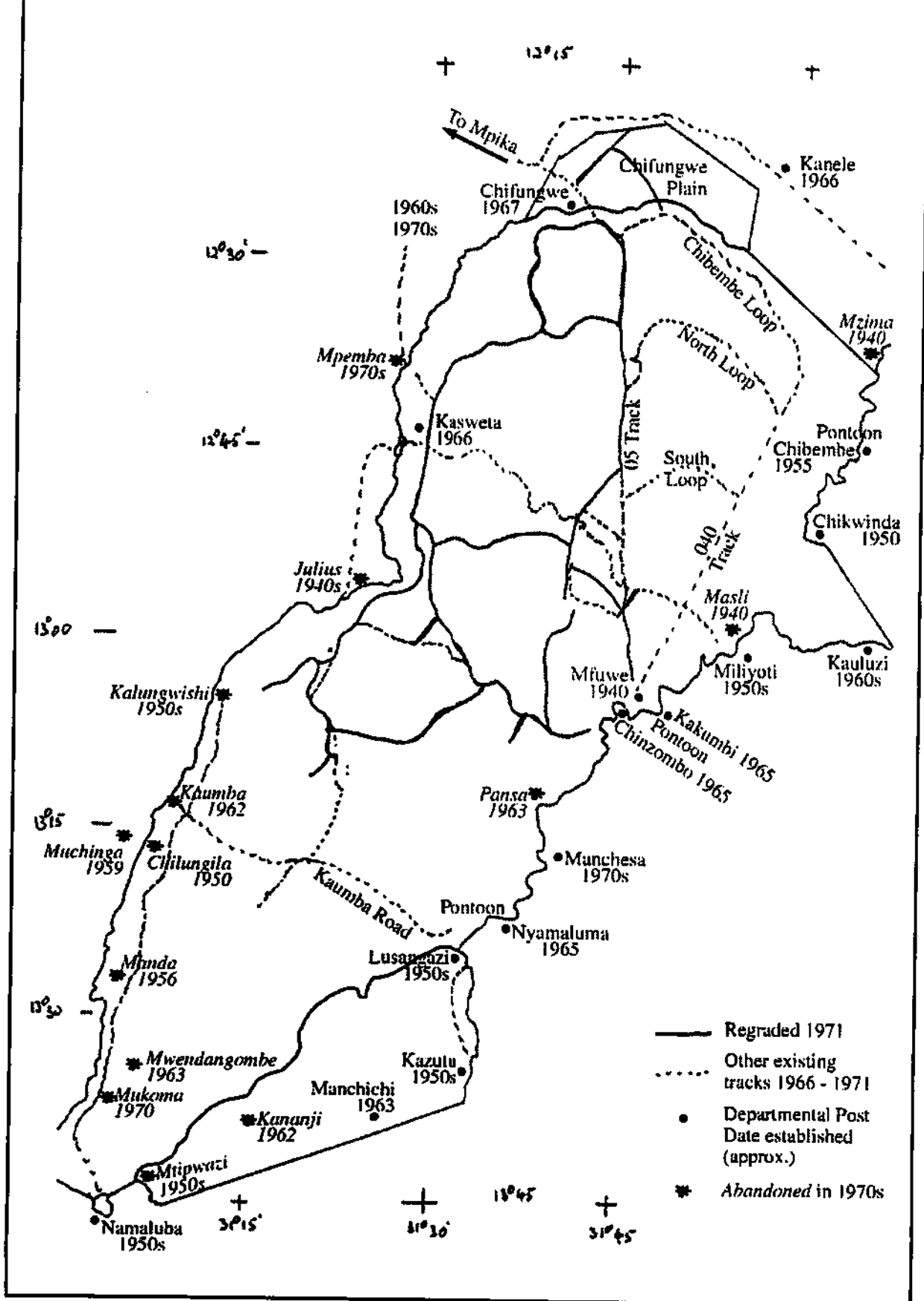
8 Administration, Management and Research in the Reserve

8.1 Administration and Management, 1946-1970

In the early years after the second world war the administration of the Department was on a provincial basis with Provincial Game Officers in Fort Jameson and Kasama responsible for the Eastern and Northern Provinces with parts of Central Provinces respectively. The Luangwa Development Unit set up in 1955 under Senior Ranger W.E.Poles covered areas of the South reserve in all three Provinces, section 7.1. In 1960 a Luangwa Command, based in Fort Jameson, was established to be responsible for the South Valley Reserve, the two Native Authority Reserves of Luambe and Nsefu, Lukusuzi Reserve, Lundazi Dam Reserve, and Nyika Reserve.

Norman Carr, who had left the Eastern Province in 1950, was recalled to Fort Jameson in August 1960 as the first Luangwa Command Warden with the specific brief of conducting a land-use survey of the Valley in order to make proposals for the control and utilization of the fauna, section 9. After completing this work Carr left the Department for the private sector to commence his outstanding development of safari hunting and tourism in the Valley and was replaced as Acting Warden W.R.Bullock in March 1961. The South Reserve was now administered on a Sector basis under a Sector Ranger or Assistant Ranger. The Sectors were Lusangazi and Mfuwe; a Ranger, M.Ronaldson, had been stationed at Muchinga Camp on the lip of the Muchinga escarpment in 1960/61. This camp was moved to Kaumba, at the base of the escarpment in the Lusangazi Sector, in

Firebreaks, tracks and Departmental Posts, 1971



1962 with Scout, later Assistant Ranger, W. Chiwalo in charge. The Game Officer Lundazi was responsible for the northern part of the Reserve from 1961. There were usually two Guards at each Wildlife camp within the Sectors although some had three, and those at a Reserve public entrance had an additional Gate Guard. Pairs of Guards would patrol their areas on foot, accompanied by one or two 'carriers', to guard against poaching, map 18. The patrol patterns were laid down by the Sector Ranger, who also patrolled regularly on foot with the Guards. This system worked well against the casual village poacher, but it required good logistic support. When this could not be provided because of shortage of money and other reasons in the mid seventies, the system broke down in the face of organized, commercial poachers with their superior fire power (Leader-Williams et al 1990; Milner-Gulland and Leader-Williams 1992).

Park Management policy on wild fires by 1964 was to burn in June (early burn) the perimeter of the Reserve and thereby to prevent the spread of fires later, started either accidentally by staff or deliberately by poachers. The Department constructed a network of tracks inside the Reserve which could be quickly made into a firebreak to localize any fire. In 1970 the network of tracks built by prospecting companies, section 7.2, was expanded by some 350km, map 18. These were either 8 m or 40 m wide. The average cost was K109 per kilometre (Allen-Williams 1971). Much of this road work was done by the 'Conservation and Works Unit' of the Ministry of Agriculture after the routes had been aligned by me or Guard Rabson Phiri. The Department had acquired two road-graders during the well funded period 1964-1970, and these enabled wild fires in the Reserve to be more or less successfully controlled, but in later years the fire breaks were not maintained and the burned area significantly increased (Yang 1994). Most of the tracks followed watersheds, although one followed the base of the Escarpment southwards from Kaumba to Namaluba Camp, one of 17 Wildlife Camps which were built or upgraded on the Park perimeter in this development phase. Graded tracks were also constructed on the watersheds of the Chifungwe Plain in 1966.

8.2 Research and survey

In 1948 the Department had been amongst the first in Africa to appoint professional biologists, but these officers usually held the largely administrative post of Provincial Game Officers (PGO) responsible for the Province in which they were stationed. The PGO stationed at Fort Jameson from 1950 to 1960 was R.I.G. Attwell. D.R.M. Stewart was stationed at Mpika from 1958-59 as a biologist under the Provincial PGO at Kasama after working for a few months with Attwell and at Head Quarters, Chilanga.

Most of the scientific work of the Department up to and during that time was in the fields of ornithological and mammalian systematics, and the Department gained an international reputation in these fields. From 1947 onwards there was a long period of co-operation with the Bulawayo Museum, in addition to links established earlier with the Kaffrarian Museum in King Williams Town, South Africa. In 1963 a Natural History Museum was established with the assistance of Departmental staff as a section of Livingstone Museum.

By 1971 over 100 scientific papers had been written in addition to outstanding works on mammals (Pitman 1934; Lancaster 1961; Ansell 1960), birds (Pitman 1934; Winterbottom 1939; White & Winterbottom 1949; Benson and White 1957; Benson *et al* 1971), fishes (Jackson 1961) and reptiles (Broadly 1971). Many of the officers of the Department were renowned collectors of natural history specimens; in the Valley those who made noteworthy collections of birds, mammals and reptiles were W.F.H. Ansell, R.I.G. Attwell, C.W. Benson and his assistant Jali Makawa, P.S.M. Berry, W.R. Bullock, R.J. Dowset, D.G. Lancaster, W.E. Poles, J.B. Shenton, and J.M.C. Uys. L.B.S. Estcourt, J.L. Birch, N.J. Carr were others who recorded notes on their observations.

B.L. Mitchell, S.D. Prince, and I, with my assistants Rabson Phiri and W.L. Mulenga, collected plants and established a field herbarium at Mfuwe. J.M.C. Uys, P.J. Nel, W.L. Mulenga and I discovered important fossil sites in both the South and North Reserves (Utting 1988). The Department's Journal 'Puku' was established in 1963 to publish observations of both general and scientific interest, the latter were predominantly zoological. Both collecting and publications by the Department's

staff virtually ended after 1974, 'The Puku' was not published after 1973, and only three scientific papers by Departmental staff were noted in Annual Reports 1975-1984, the field herbarium was neither extended nor maintained although, unlike earlier years, the Department was now staffed by professionally and technically qualified officers.

By the late 1950s there appeared to be an increasing awareness of the need for scientific work to be directed away from systematics and towards problems of wildlife utilization and habitat conservation, although this awareness did not result in any formal declaration of research programmes nor of how they should relate to management.

The Game Department had not been treated as a scientific department by the Colonial Administration. It had been placed within the Administration, later Ministry of Native Affairs when a ministerial system was introduced in 1959, reflecting the political sensitivity of wildlife affairs, although statements on wildlife policy in the Legislature were made by the Member for Agriculture and Natural Resources (AR1958). Problems involving wildlife and Park management were regarded by those who controlled the budget primarily as administrative in nature, to be solved by administrators without the help of scientists. In 1958 following the recommendation of a visiting consultant (Fraser Darling 1960) the post of Provincial Game Officer was abolished with the intention of permitting a Biologist to concentrate on research matters, section 11. The effect of this change was that the supervision of research by a Biologist in the game estate was placed in the hands of senior non-professional staff and the employment of scientific expertise in the day-to-day management of the Park was effectively removed. The Department became unique in the civil service in that the duties of professional staff were administered and supervised by unqualified officers of a lower grade (AR 1965). The problem was exacerbated with the drive for 'Zambianisation' of civil service posts which followed national Independence as the new administration initially followed the custom of the Colonial administration in appointing unqualified officers to senior positions.

The approach to Park management and the type of research conducted by biologists slowly started to change in 1960 when with the assistance of visiting scientists a research programme was established in the Kafue National Park (Dodds and Patton 1968). In 1962 Biologist W.F.H. Ansell, already an internationally recognized authority on the systematics of African mammals, was transferred to Fort Jameson and assumed responsibility for scientific work in the Reserve, but he did not have the resources to carry out all of the ambitious programme he proposed. His programme included proposals for vegetation mapping; the construction of animal enclosure plots in Mopane woodland and analysis of the vegetation within them; experiments on the effects on the vegetation of burning at different times; large mammal surveys; mapping of the incidence of bush fires; food studies of mammals (Department, Annual Reports of the Biologist, Fort Jameson). It is noteworthy that the emphasis was placed on Practical Management Problems. However, after initial enumerations the animal enclosures were not maintained, and Ansell did not have the resources to implement his proposals. The Forestry Department did assist Ansell for a briefly in the preparation of sketch maps and woodland enumerations (Grout 1963).

In 1964 W.R. Bainbridge was appointed Chief Game Officer on transfer from the Forestry Department. As a forester Bainbridge had experience in land-use survey, although he believed that this particular experience was not a factor which influenced his appointment as it was not discussed with him at any stage of his recruitment (W.R. Bainbridge personal communication). Concurrently more funds became available to the Department after National independence.

Bainbridge drew up a research plan for the Reserve under three main headings, 'habitat and vegetation studies', 'wildlife populations and dynamics', and 'culling programme' to reduce the numbers of hippo, buffalo and elephants (Bainbridge 1964).

Research started in 1965 with surveys of the habitats and large mammal populations of the Reserve using resources newly provided under a Transitional Development Plan prepared when Zambia gained independence. The research was to be conducted under the local control of the 'Warden Luangwa Command' and depended on amicable relationships among the Biologists, the

Warden, and the Chief Game Officer. Suffice it to say that the nature of these relations may be gauged by the fact that of the three Biologists appointed in the Reserve in 1965 only one remained there for more than a few months, one resigned and the other fled to Chilanga headquarters. More seriously, Bainbridge himself left the Department in 1970 after failing to persuade others of the value of his approach, consequent conflict with the Wardens and, it was rumoured within the Department, political interference from the very highest level. The Department was then reorganised as a Research and Management Division, under a Chief Wildlife Research Officer, and a Conservation and Development Division, under a Chief Wildlife Warden. The former Division prepared management plans, based on survey and research, the latter was supposed to implement the plans. The reality was that results from the research did not become incorporated into any 'management plan' for any Reserve except for some input into Tourist development schemes. Later, in 1972, as Chief Wildlife Research Officer, I prepared a uniform format for management plans for all National Parks. Resource surveys were made and management plans written for the South Luangwa, Kafue, Lukusuzi, and Nyika National Parks. The format was based on that then in use in the Scottish Nature Conservancy modified by experience gained in the South Luangwa (Eggeling 1964). As well as basic resource descriptions, the plans included those for developing tourism, road alignment and construction, fire control, prevention of poaching, and monitoring programmes for both habitat and mammal populations. The plan for the Park was finalised in 1974 (Kuper 1974). Management plans were supposed to be implemented by the Conservation and Development Division, that is the Warden and his staff, but I am unaware that any ever were.

8.2.1 *Vegetation and Habitat studies, 1965-1990*

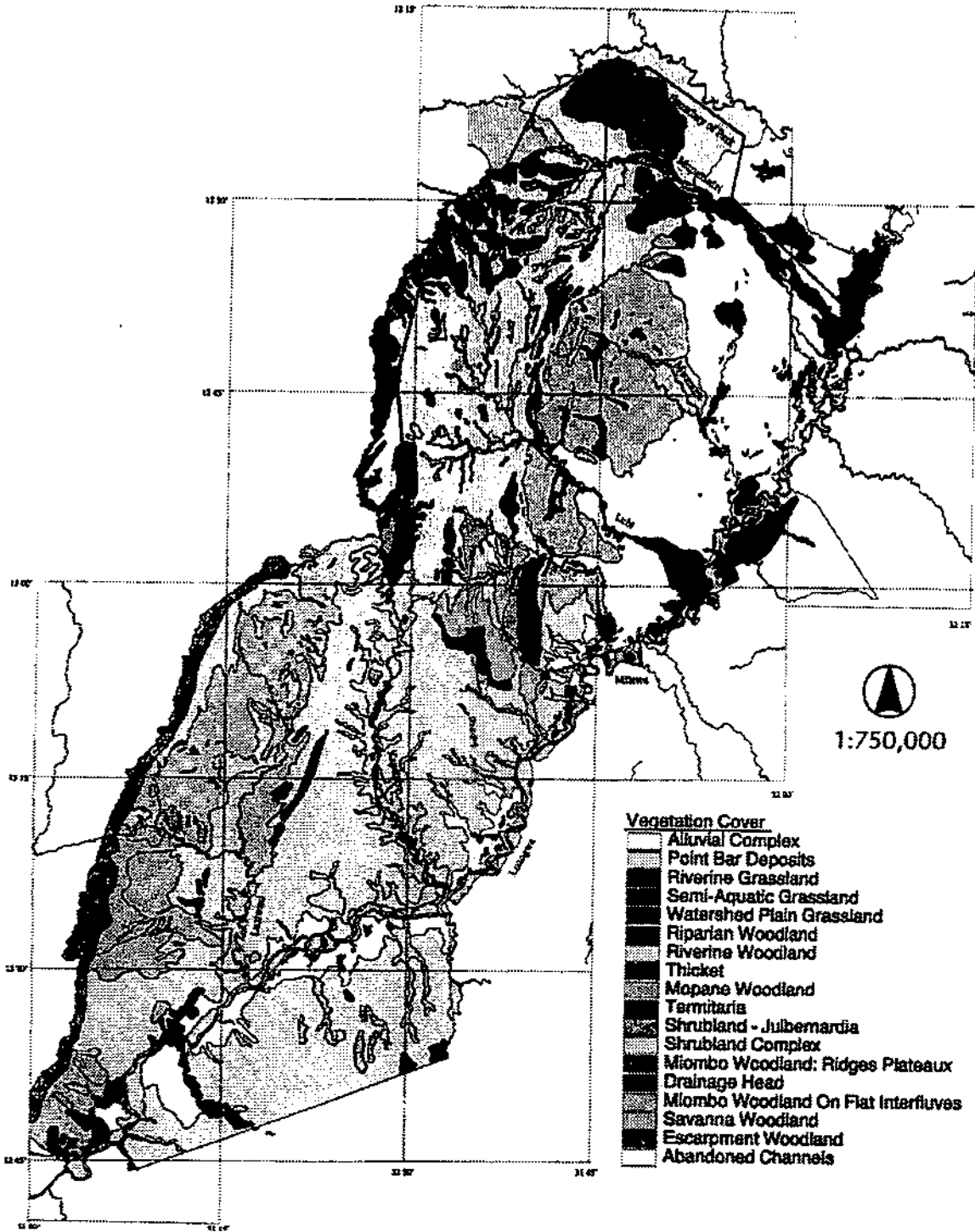
The Chief Game Officer, W.R. Bainbridge, required that the vegetation and habitats of the Reserve be surveyed, classified, described and mapped at a reasonable scale. His intention was to prepare management plans based on objective data on the habitats, their utilization and their reaction to fire. He recruited an ecologist with experience in the Ministry of Agriculture, me, for this programme. Bainbridge obtained the assistance of the Army to mark four lines radiating from the Reserve's airstrip on magnetic bearings of 005°, 040°, 240°, and 270°, tracks were then graded on two of these lines, viz. 005° line, 80 kilometres to the Mupamadzi river in 1965, and on the 040° line in 1966, 64 kilometres to the Chibembe distributary. The survey lines were intended to provide ground control for aerial photography which was flown in 1965 (black and white at scale 1:30 000) and which was essential for the habitat surveys then about to commence. The specific aims of the surveys were to describe and map the habitat types in qualitative terms in order to provide a framework for more quantitative studies and to establish a programme to monitor the vegetation changes over time. There were to be associated studies on the numbers and distributions of large mammals. The hope was that vegetation types essential for the well-being of large herbivores could be identified and their ability to support animal populations assessed. Neither time nor resources permitted a detailed study of the vegetation throughout the Reserve such as would be required for a classification of the vegetation based on floristic composition. The areas selected for detailed study were those identified from initial observations as most intensely used by animals. These were the alluvial areas of the Luangwa river, those dominated by mopane, and areas of shrubland. The Reserve was mapped using air photo interpretation coupled with quantitative field description of typical stands and field testing of the map.

The largest scale topographical maps then available for the area were the 1:250 000 series, those at scale 1:50 000 were not published until the mid 1970s but a reconnaissance geological map had recently been prepared at a scale of 1:90 000 (Drysdall & Weller 1962).

Soil surveys had not previously been conducted inside the Park although a small area outside had been surveyed for agricultural development (Webster 1957). Soil pits were now opened in representative vegetation, and the profiles described with the assistance of specialist soil scientists of the Ministry of Agriculture (Wilson and Lee 1966). The initial phase of the habitat survey was concluded with the assistance of a visiting consultant, R. Webster, when the results of the surveys were combined in an account of the geology, landscape, soils and vegetation in comprehensive landscape units (Astle *et al* 1969; Astle 1989).

Vegetation of the South Luangwa National Park
(W.L.Astle 1992)

South Luangwa National Park - Vegetation Map



Cartography by Dr Jingli Yang, University of Maryland.

During the initial phase of the habitat survey a collection of plants was named and a field herbarium established. These collections formed the basis of accounts of the flora of the Luangwa Valley (Phiri 1989), check list of plants in SLNP by W.L.Astle *et al.* (1997a), and a Vernacular-Botanical Dictionary of plant names (Astle *et al.* 1997b).

The second phase included the establishment in twelve areas of 'permanent plots' within which the vegetation was enumerated between 1966 and 1968 and 'fixed-point' ground photographs exposed of each of the 510 plots (Prince 1969). This phase was initiated by a Biologist, S.D.Prince, appointed under the Voluntary Service Overseas programme, and continued by me. The intention was to monitor the vegetation regularly with the hope that changes could be related to animal densities. However the biologists of the Department did not monitor the plots after 1975. The plots were re-recorded in 1988-1990 when I returned to the Park, with the support of a grant from the Leverhulme Foundation (Astle and Prince in preparation). At the same time the records from the enumerations in the 1960s and 1980s were used to evaluate the use of data acquired by satellite in vegetation survey and monitoring (Fuller 1994; Yang 1994).

Large scale aerial photography, (1:5000 and 1:10 000), of the Luangwa riverine strip between the Mushilashi and Chibembe rivers was flown in 1970 with the intention of monitoring vegetation change by repetitive flights in subsequent years. (Similar photography was flown for a different purpose over the Luangwa river south of the Lusangazi in 1929).

Daily rainfall figures had been collected at Mfuwe since 1960, and in May 1968 a meteorological station, number 143, was established at Mfuwe with Stevenson screen thermometers, cup anemometer, sunshine recorder, standard rain gauge, automatic rain gauge, evaporation pan, and ground minimum thermometer. The station was moved to the Chinzombo station in 1971 and eventually to Masumba airport.

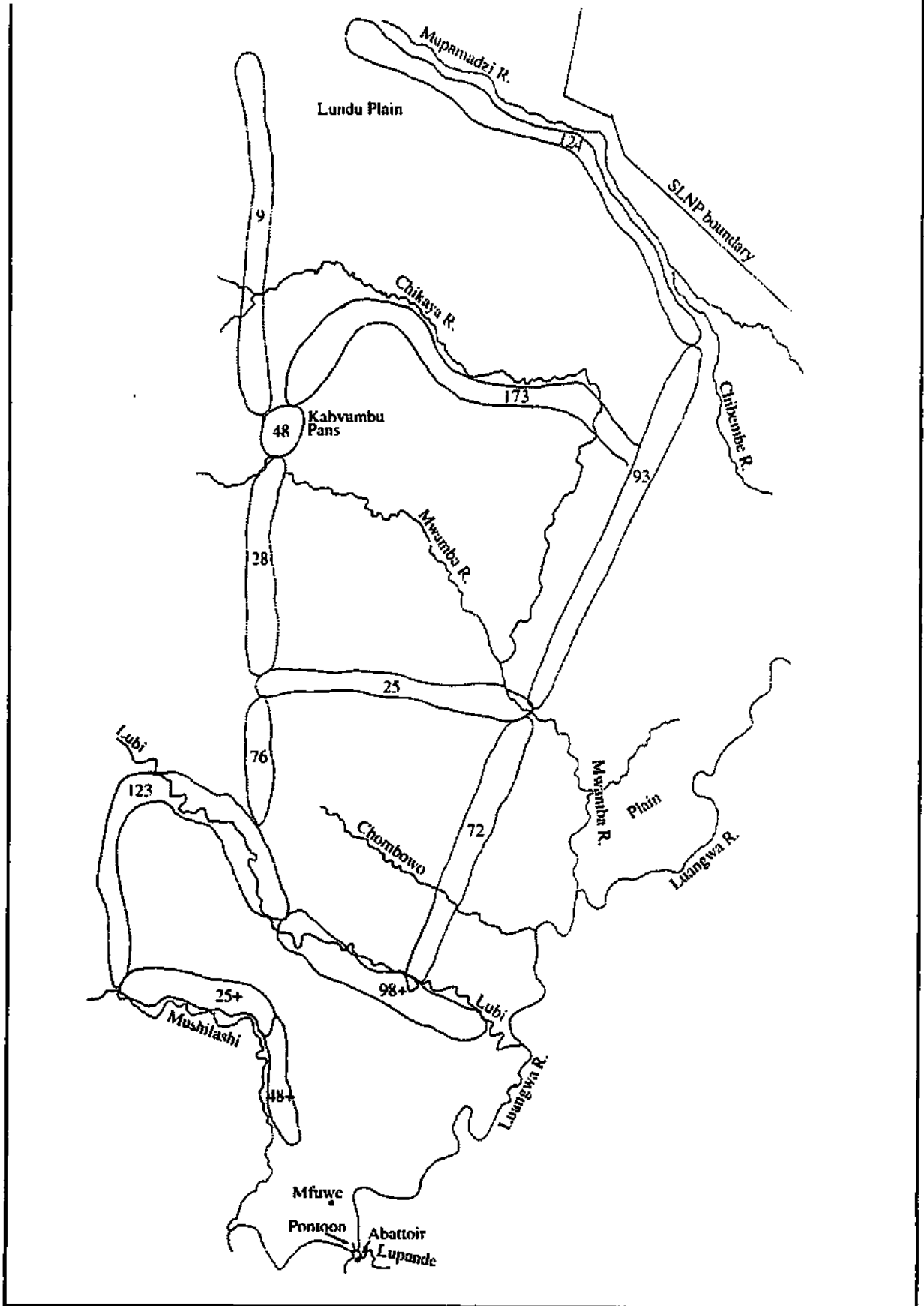
8.2.2 Large Mammal Surveys, 1952-1973

Estimates of animal numbers in the Valley had been made by early travellers and hunters, (sections above). The most accurate repetitive records for any animal are those for hippo which were commenced by Biologist R.I.G.Attwell in 1952 and continued by Biologist W.F.H.Ansell and others (Attwell 1963; Ansell 1965; Berry 1968; Dowsett 1966, Dowsett 1971; Norton 1988), note 9h. Ranger W.E.Poles estimated in 1951 the large mammals in the North Reserve, South Reserve, and the Munyamadzi Corridor based on his ground observations, note 9a. The first aerial census of the South Reserve was in October 1964 by Warden J.M.C.Uys, note 9b. A pilot Ranger was appointed in the Department in 1966, and in the following year the World Wildlife Fund and the Beit Trust donated a Cherokee 235 and Piper Super-Cub aircraft. A second pilot Ranger was appointed in 1968 to the Department's 'Flight Section', and the number of aircraft increased to five. This was augmented in 1971 by the addition of a Bell 206A Jet Ranger helicopter which was donated largely by the British wildlife artist, and frequent visitor to the Luangwa, David Shepherd; by this time there were three pilot rangers in the Section, which was based in Lusaka, but used throughout the country.

The large mammal surveys in the programme designed by Chief Game Officer Bainbridge were conducted by Biologist P.B.Dean and his assistant R.J.Dowsett. (Dowsett, a noted ornithologist, during this period also compiled the first check list birds of the Reserve [Dowsett 1969]). The first survey was in July 1965, notes 9c, 9d. These surveys were repeated by D.Patton in 1967, and the ecologists of the Luangwa Conservation and Development Project, section 9, on various dates until 1973. The results of these surveys are given in notes 9e, 9f, 9g and 10 and illustrated in maps 23, 24, 25, 26. The detailed ground census of large mammals in the areas to the west of the alluvial zone of the Luangwa, made by O.Lieberg, Associate Expert of the above Project, remains the only one ever conducted in that area, note 10.

The number of elephants in the Reserve was a particularly contentious subject, and there was constant criticism both within and outside the Department of the estimates made by aerial survey. The detailed work of the Luangwa Project, section 9, eventually showed that variation in estimates of numbers could be attributed to the variation in the census techniques used, especially to the altitude of

Elephant Culling SLNP 1965 - 72



the plane, the width of the sampled area, and the experience of the observer (Caughley et al 1973).

8.3 Animal culling within the Park, 1965-1972

Culling appears to have started in the Reserve as a feasibility study of meat production, with no attempt to justify it for management to maintain the habitat (Feely quoted in Stier 1973b). "*The time is now opportune to attempt to produce game meat as a commercial venture and on a sustained yield basis for consumption in urban areas.*" (AR 1964).

In 1965 following the small-scale experimental programme in the Reserve in the previous year, section 6.3, the Department expanded its culling programme with an additional purpose: "*Although this scheme was introduced primarily as a conservation measure to control the severe degradation caused by over-population of certain animals, it has also played a most important part in establishing the commercial value of animals such as elephant when exploited for meat and by-products.*" (AR1965).

The Department's concern over reports of local large concentrations of animals and consequent damage to vegetation in the Valley started to appear as early as 1947 although in 1932 Pitman had recorded: "*Near the Kapamba-Luangwa confluence there were a few herds of elephant, totalling several hundreds, which had been creating havoc in the mopane.*" (Pitman 1934). In 1960 Ranger W.R. Bullock published an account of destruction of baobab trees by elephant, a phenomenon that had also been noted in Ranger J.B. Shenton's tour reports in 1952 and in published accounts (Bullock 1960; Shenton 1954). When the British ecologist F. Fraser Darling, financed as a consultant by the Conservation Foundation of the United States, briefly visited the north east of the Reserve in the late dry season of 1957 he did not record any severe degradation of the vegetation. Rather the reverse: "*I could not say it bore signs of over-use...*" although he briefly presented a contrary opinion in another section of his report: "*Indeed there are already signs of overgrazing*". (Fraser Darling 1960). However he did firmly recommend that game stocks should be controlled if necessary to prevent destruction of the habitat. Other more locally experienced ecologists were soon describing heavy over utilization of valley vegetation (Verboom 1961; Uys 1964; Uys 1966).

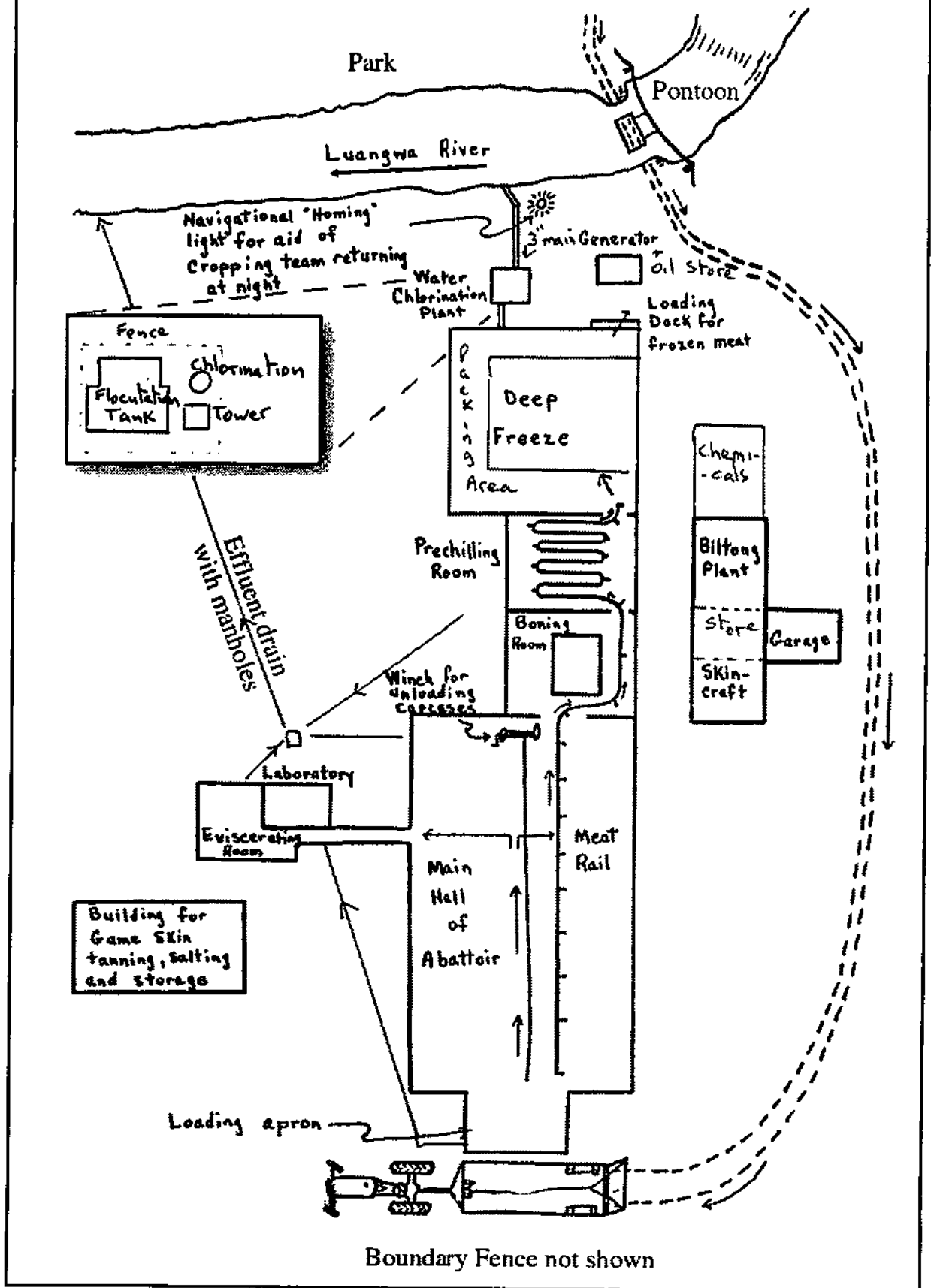
Aerial photographs of parts of the alluvial areas of the northern section of the South Reserve taken in 1957 and repeated in 1965 showed tremendous differences in the condition of the vegetation. The most dramatic of these changes had occurred on the brown clays in the alluvial area north of the Mwamba river. Here large areas of mopane woodland had been destroyed. In some areas such, as Lion Plain, this destruction of trees was almost certainly due to local flooding, but in other places the cause was not as clear. Some ecologists attributed the changes directly to browsing and destruction by elephant because of the widespread ring-barking of mature trees, others thought that the cause was fire acting alone (Bainbridge 1969; Lawton and Gough 1970; Astle 1971). As well as widespread destruction of mopane woodlands other genera were less common inside the Reserve than they were outside, especially species of *Commiphora*, *Dalbergia* and *Acacia*, all favoured by elephant. Baobab trees in the Reserve were also being heavily browsed and, in some cases, felled (Uys 1966).

Whether these changes in the vegetation were cause for alarm or were even desirable became the subject of much controversy, but no decision on the aims of management with respect to these changes was ever taken within the Department (Abel 1974; Astle 1971; Gough 1973a; Lawton and Gough 1970). At one extreme there was the view which held that the mopane woodland was a key habitat for the elephant and that its destruction would lead to a 'population crash'. At the other was the belief that the Park, as a natural system, would regulate itself in both elephant numbers and condition of mopane woodlands without interference. Some people wanted to stabilize populations at some arbitrary figure. In the event the Department commenced to cull elephant, hippopotamus and buffalo within the Reserve, initially, as was stated above, as a commercial venture (AR1964), but later justified as a means of habitat management (AR1965). The programme was said to be experimental and was eventually destroyed by the heat of the controversy it generated locally, nationally and internationally.

Culling of elephant, buffalo, hippo, and impala started in the Reserve in 1965. A sophisticat-

Diagram 1

Kakumbi Abattoir (From Bindernagel, 1968)



ed abattoir was built after consultations with the Departments of Health and of Veterinary Services and with the Cold Storage Board. It was sited on the left hand bank of the Luangwa at the Lupande confluence, the site was named Kakumbi, where the Luangwa was both the source of water supply and sink for offal. The crocodile population in the river at this point expanded rapidly. Frozen game meat was trucked to the urban markets of the Copperbelt, and game meat also started to appear on the menu at Mfuwe Lodge.

The original abattoir complex consisted of a large hall, 24.6m x 13.3m for skinning, gutting and meat inspection, a washing room, a boning and meat packing room, and a freezing section, this last consisted of two chambers, a 3-tonne capacity one for pre-chilling with a temperate of 0°C and a deep freeze with a temperature of minus 6°C and a capacity of 9.75 tonne (Botha 1970; Steele 1968; Bindernagel 1968). In the following year a second pre-chilling chamber and a laboratory were added. Electricity was generated on site, and there was a treatment plant for Luangwa river water, Diagram 1. The whole complex was surrounded by housing of several grades and topped by a powerful industrial hooter.

Various drugs and weapons were investigated in the field for their suitability for culling. In the first year elephant were killed by injecting a massive dose of sucanyl choline chloride using a dart gun. This gun could project a 20-ml dart over some 50 m with reasonable accuracy. The cropping team consisted of the leader armed with the dart gun, a colleague armed with a heavy rifle, a man carrying the bleeding knife, and a fourth carried spare equipment. Initially only single elephant were darted. In the second year the hunting technique was changed as the drug-dart method was considered to be inefficient, heavy calibre rifles to cull entire family groups were now used. Hippo were hunted at night, using the light of a powerful lamp, with either a dart or, if near to the river, a rifle (Manning 1995; Stier 1973b).

Once the animal was down and bled it was winched on to a low-loader which would transfer it to a 5-tonne truck for transport to the abattoir, screened from sight of the tourist by a tarpaulin. Access from the Park to the abattoir was via a special cropping pontoon near the abattoir so that culling proceeded concurrently with tourism but in separate areas. There were claims that the carcass could be used for meat for up to eight hours after slaughter which would result in a working radius of about 160 km from the abattoir given a reasonable road system, map 20. Shot hippo sometimes ran into the river. Recovery of the carcass from the river caused a delay and this reduced the working range.

At the abattoir, meat was wrapped in polythene sheeting and packed in metal containers each of which which could hold about 22 kg. After about 48 hours the frozen meat was removed from the containers and trucked to the urban markets along the line of rail where it was marketed by the Cold Storage Board at a heavily subsidized price.

In 1965 the actual number of animals culled was far below the targets set at the start, only 27 elephant instead of the 200 target; 9 of the target 250 hippo; and 33 instead of 1200 buffalo, note 7. Thus only 44 per cent of the abattoir's seasonal capacity of 227 tonnes was produced in 1965-66 (Stier 1973b). The shortfall was attributed to mechanical breakdowns and difficulty of bringing the carcasses to the abattoir. Despite this shortfall the abattoir's capacity was later increased by 50 tonnes, but throughout its eight year life production remained at half capacity.

Revenue from meat sales for the scheme started at K3000 in 1965, peaked at K73 000 in 1968 and declined to K44 000 in 1972, note 8. Records of by-products from the culled animals are sketchy, but in 1966, the only year for which accurate records are available, the mean weight of ivory from 204 animals was 6.9 kg (Stier 1973b).

The market in the Copperbelt for elephant and hippopotamus meat was limited, even at the low prices at which it was offered, and saturation was estimated to be about 100 tonnes, which included substantial amounts used for sausages and other processed meats as well as that bought for domestic pets. There was found to be a very limited market for 'biltong', which had been made on a trial basis in 1966. With hindsight it is clear that Government would have saved money by offering the carcasses free of charge at the Park entrance, as was done in Uganda with culled hippopotamus (Bindernagel 1968).

The total estimated capital cost was estimated to be K201 000. The recurrent cost for 1971 was K76 000. In 1971 54 permanent staff were employed. An economist who studied the scheme

for the Department concluded:

"...(the process)...necessitated a complex, interrelated system of supply, processing and distribution which was highly capital intensive...such a system is neither entirely practical nor desirable ...(for conditions in the Valley)." (Stier 1973b).

A problem which had bedevilled those responsible for the culling programme was the variation in the estimates of the number of elephant in the Park and elsewhere, note 9f.

The culling programme stopped at the end of the 1972 season by which time several research programmes had been concluded (Dillmann 1976; Dillmann and Townsend 1979; Hanks 1971; Marshall and Sayer 1976; Rogers and Elder 1972; Sayer and Rakha 1973; Caughley and Goddard 1975). Hanks' research on the reproduction of elephant led him to conclude that there was no evidence for the population 'crash' so widely predicted by visiting scientists and that there was no ecological justification for culling (Hanks 1971). Hanks' interpretation of his data was contested by experts of the Luangwa Valley Conservation Project who continued to advocate a large culling programme, section 9.

In the event uncontrolled poaching after 1974 reduced the elephant population to what the experts had thought to be the ideal, but this led to very marked changes in distribution and herd sizes with drastic effects on the vegetation in these areas. This has come about because the survivors were, by 1986, grouped in large herds along a short length of the Luangwa river where they remained throughout the year, usually but not invariably protected from poaching by the presence of tourists. Previously elephants would range the Park in the dry season in small family groups, returning to graze the alluvial grasslands in the rains, map 24. Consequently, their densities are now probably not much changed in the tourist area but much less elsewhere than they were in the 1960s. The Mopane woodlands north of the Mwamba river, the degradation of which was often cited as an indicator for the necessity of culling, had been mainly destroyed prior to 1965. The alluvial area north of the Mwamba river, which was once closed Mopane woodland is now short grassland, although changes in the flow of the Mupamadzi might have reduced tree regeneration. In other areas of Mopane woodland the number of canopy trees has declined by about 30 per cent from the mid-1960s.

9 Wildlife and Land Use Planning, 1946-1966 and the Luangwa Valley Conservation Project, 1966-1973

The Colonial administration had recognized from the time it established the Department the importance of wildlife in the rural economy (Vaughan-Jones 1948). The 'Game Estate' it had established was based on two perceived requirements, namely;

- (1) protection of domestic animals and crops from game in inhabited areas and
- (2) conservation of game stocks to permit future sustained utilization in those areas where there was little potential for agriculture or other forms of development.

Native Authorities were involved and benefited from revenue or by-products, sections above. With increasing human populations, movements of people to and from towns, better communications, and changes in farming practices the need for better land-use planning in wildlife areas outside Reserves became increasingly obvious as the Department gradually became operational after the Second World War. The Department since its inception was strongly of the view that wildlife was the main economic resource in the Luangwa Valley, although this opinion was not based on any assessment of other forms of existing or potential land use, and none of its officers appointed before W.R. Bainbridge, as Chief Game Officer, had any experience of land-use planning. (It must be said that the Department's opinion of the economic value of wildlife was not widely shared; the Northern Province Development Scheme followed a report in 1956 which makes no mention of the economic potential of wildlife although much of the Valley lies within that Province [Watmore 1956]. This well-funded development scheme operated from 1957-1963, development funds were confined to

forestry, fisheries and agriculture, road and bridge works, health schemes, and schools).

All Regional Wildlife Conferences since the first held in Kenya in 1946, including the sixth in the series which was held in the Luangwa Valley in 1959, had considered the role of wildlife in land use planning (East Africa 1947, East Africa 1950, East Africa 1952, East Africa 1956, East Africa 1959). When the first Warden, N.J.Carr, was appointed to the unified Luangwa Command in August 1960 he was given a specific brief to prepare a Land Use plan for the Luangwa Valley based on wildlife. This he completed some six months later and then left the Department.

The Carr Land-Use Plan was considered by the Provincial planning sub-committee, and a revised draft was prepared by Carr's replacement, Warden W.R.Bullock. The area under consideration lay in three Provinces, had five Districts, six major Chiefs; 60 per cent of the male population worked elsewhere. The proposals were that there would be a management area consisting of a 16 km-wide strip along the east bank of the Luangwa river from the Lusangazi northwards to the north of the North Reserve, but the existing Nsefu and Luambe Reserves would be retained. On the west bank there would be a shorter riverine strip of similar width connecting the North and South reserves. The total Management Area would cover about 2860 km². The plan would require the evacuation and resettlement of about 75 villages containing about 2000 people. This would facilitate the provision of health, education and other services. About half of the Lukusuzi Reserve and all of Lavushi Manda Game Reserve would be given up to permit resettlement. The plan also analysed the likely benefits that could be expected from wildlife utilization based on safari hunting, game viewing camps, sale of game licences, and the culling of large mammals for local consumption, proposing that the revenue from this would be paid to the Native Authority (Bullock and Carr 1961). It was estimated that these activities would yield £35 000 annually but as these were acknowledged to be vague estimates and in order to encourage the people it was proposed that each NA would be given an annual grant of £6000, an amount which would be reviewed after three years. The Plan was favourably received by the Development Team of the Eastern Province (ZNA 54). The Secretary for Native Affairs in Lusaka had reservations, however, mainly over the proposed relocation of population. No doubt the haste with which the plan had been prepared, which must have precluded any significant survey work, was the reason. Consequently the opinions of the Special Commissioner for Natural Resources, were sought. The Commissioner thought that the approved Eastern Province plan was based on 'special pleading' (for wildlife). He wrote: "*The policy needs to be decided whether*

(a) The Valley is to be used for the conservation of its fauna with the interests of the local people fitted in to the greatest possible extent or

(b) The Valley is to be used for preserving and perhaps developing the way of life of the people, that the fauna be conserved to the greatest extent consistent with that main purpose..

It is suggested that this decision be made first."

He pointed out that most outsiders would approve a general policy that the rich fauna of the Valley should be conserved, but: "*...that is not the view of the local people, (and of some outsiders) which is ...that the purpose of the Luangwa Valley is to provide the people there with their customary way of life"*. (Anon 1962b).

He called for a detailed Land-Use Survey and Plan for the Valley.

In 1961 the Department re-emphasised its belief in the validity of economic utilisation of wildlife (AR 1961) in the face of others who were more sceptical of the economic advantages of wildlife. Thus:

"In conjunction with agricultural development game is a liability...touring officers are never allowed to forget this by the villagers...a letter from the Provincial Agricultural Officer plainly states that agricultural expansion was not possible unless there was a stricter control of garden raiding animals. A total of 180 elephant were killed as compared with 232 in 1953." (Annual Report of the PC Eastern Province 1954).

Officers of the Department also noted that agricultural development resulted in a deterioration of game populations in Controlled Hunting areas (AR1963). Policy concerning Game preservation outside the Reserves and how this was affecting agricultural development was frequently discussed

at inter-Department meetings in Fort Jameson (ZNA 44). At one such meeting in 1959 the Provincial Agricultural Officer reported that 20 per cent of the area planted to cotton in the Valley had been damaged by game. He was supported by the District Commissioner: *"I quite agree with you that energetic game preservation is fundamentally incompatible in the inhabited areas of the Luangwa Valley with active agricultural development...the clash was first sounded when the question arose in 1951 of protecting the area between the river and the valley road for the sake of the Safari parties."* (ZNA 44, folio 9th September 1959).

After this meeting the Provincial Resources Sub-Committee agreed that because of its assumed subsistence value game should not be 'eliminated' from agricultural areas but that crop protection should be increased and villagers fully informed of their rights to protect crops (ZNA 44).

In the reports of the debates of the Legislative Council those members representing African interests were strongly of the opinion that game should be confined in the Reserves despite the claims of the 'Nominated Official' Vaughan-Jones of the cash and meat value to the villagers of game, section 5.1.

In an attempt to reconcile these conflicts of interest the Ministry of Native Affairs in 1960 appointed a Wildlife Committee to: *"Advise on matters relating to wildlife, particularly in respect of the need for rural development planning to provide for the institution of game management schemes to conserve and utilize wildlife resources; the need to educate all sections of the public in the value of wildlife and the urgency of conserving it; problems of game control; and means of meeting the need for adequate research in respect of both management and control"*.

Note that conservation of wildlife was assumed by the Wildlife Committee to be desirable not only in Reserves but also in inhabited areas, and the view held by many agriculturists and others that its destruction in these latter areas might better serve those who suffered directly from its depredations was ignored. Note also that the Wildlife Committee was formed immediately after swingeing cuts in the Department, it was apparently suggesting that the function of the Department would be advisory rather than executive.

The Administration issued a policy statement in 1961 that, rather than attempt to exercise control throughout the Territory, it would confine its activities to the one National Park (Kafue), the Game Reserves and the Controlled Hunting Areas. In other areas:

"Native Authorities...will be encouraged to assume responsibility for the protection and conservation of the game that exists in their areas".

This had little effect in the Luangwa Valley as the statement went on to record: *"...conservation staff will be maintained at full strength in the Luangwa. The basic principles of the policy are the recognition that wildlife is a valuable natural resource which should be utilized for the benefit of present and future inhabitants. While occupiers of land have a special interest in its wildlife its proper management is a responsibility of government. To implement the policy it is imperative to encourage the support of Native Authorities who have a vital role to play in wildlife management. It is recognized that the degree of participation and support from the local Native Authority largely determines the success of the controlled hunting areas system as a means of wildlife conservation. At the same time revenue accrues from the charging of fees for non-residents' permits."* (AR 1961).

Here it appears to be implied that Native Authorities would not be permitted to eliminate the game populations in their areas even though they might wish to do so.

In 1962 a joint Food and Agriculture Organization (FAO) and International Union for the Conservation of Nature (IUCN) survey team visited the Protectorate to assess and advise on its ecological needs. The Report stressed the need for co-ordinated rural planning and indicated the desirability of a comprehensive land use survey of the Luangwa Valley which the team thought: *"...would provide an excellent demonstration of how faunal resources can be utilised to the best advantage"*.

Once again the value of wildlife versus agriculture was not analysed, but rather wildlife conservation was seen as or assumed to be a necessity everywhere in the Valley. The Report went on to suggest that an international team be called in to carry out the basic surveys and to make recommen-

dations (Riney and Hill 1962). Government then requested international assistance for a Luangwa Valley Survey to:

"...complete an overall assessment of the present wildlife situation in the Luangwa Valley and of the adjacent forms of land use. On the findings of the initial survey, the expert will draw up a provisional management plan for the future development of wildlife utilization in one portion of the Luangwa Valley. The management plan should assess the value of wildlife utilization vis-a-vis other forms of land use and, if necessary, list suggestions for the integration of all forms of land usage throughout the Valley."

It also requested assistance to formulate proposals for more detailed surveys and management plans. The formulation survey was carried out by two wildlife ecologists, D.G.Dodds and D.R.Patton, of the FAO under the UN's Expanded Programme of Technical Assistance (EPTA) starting in October 1966. Dodds assisted the Department to prepare a request to the United Nations Development Programme (UNDP) for the second phase which was approved by Government and submitted in March 1967. The team then reviewed previous ecological work in the Luangwa catchment, drafted a detailed report on the Department's current programme and made recommendations for further research, management and training (Dodds and Patton 1968). The work of the Team was very thorough in so far as it summarised past and current work on habitats and wildlife, but of the 163 pages in the report only four are devoted to agriculture, including game domestication and agriculture on the plateaux, five to 'other resources' such as fishing, forestry, power, mining, and eleven to 'policy and planning'. (The valley habitats were described in 18 pages, water resources -6, game populations and their distributions -28, game research-3, game management-17, diseases of wildlife-2, tourism-18, the Nyika plateau-3, the Mnymadzi Corridor-11).

The '*Luangwa Valley Conservation and Development Project*' was the response by UNDP to Government's request. This Project became operational only when the designated Project manager arrived in 1968, and the agreed plan of operations was signed by Government and the executing agency, FAO, in July of the following year. Because of this slow start the Department's Biologists had been working in the South Reserve for three years before the FAO had recruited its personnel, and, inevitably, there were differences of opinion between Government and Project staff on the appropriate methods to be used and ultimately the conclusions drawn (AR1969).

Gradually the programmes of the Department and the Project became more interwoven as three more *Experts* - the FAO's term for its field staff - arrived in 1970 to join the three Biologists of the Department and the one of the National Council for Scientific Research already working in the Valley. Subsequently there were many changes in Project's international staff; the Project Manager was replaced in 1970, his temporary replacement left for medical reasons in 1971, and the permanent replacement was lucky to survive an air crash en route to from Lusaka to Chipata to take up his appointment. One Expert died in 1971, one was retired by FAO, and its administrative officer was transferred for disciplinary reasons. The Project did not become fully operational with a complete establishment of international staff and Government counterparts until mid-1971.

By 1971 there was little enthusiasm in the Department for culling in the Reserve although hippo culling continued for research purposes during 1971 and 1972. The international staff advocated continuation of elephant culling as well. It was thought by the Biologists of the Department that by 1971 the susceptible vegetation had already been destroyed by elephant; other areas were regenerating vigorously after browsing, but this regeneration was susceptible to destruction by uncontrolled fires at the end of the dry season. The report of the consultant engaged to advise on culling techniques was suppressed by the Project, but was summarised in its Final Report. The Expert responsible for tourism did not support Government's policy of excluding lodge and infra-structure development from the Park. The Department's plans for tourism in the South Reserve, for fire control measures there, for the preparation of a management plan for the Lukusuzi reserve, and for economic studies were largely implemented by its own efforts without any involvement of the FAO Project.

The Project reported on utilisation and 'trend' of plant communities: distribution and numbers

of animal populations throughout the Valley and speculated on the reasons for the historical fluctuations in elephant numbers; habitat preferences and forage utilization inside the South reserve; fire control; wildlife education and information; tourism; and aircraft requirements (FAO 1973).

One expert, R.W. Albrecht, studied agriculture and its development throughout the Luangwa catchment. His report remains the most detailed study of land use in the mid-and upper-Luangwa watershed (Albrecht 1973). Albrecht's solution to the conflicting requirements of man and beast on the valley floor was the recommendation that scattered farming areas should be amalgamated by voluntarily regrouping of farms in larger blocks within which wild animals would be eliminated and roads and other infra-structure developed. However he suggested that the Luangwa riverine area should be allocated for wildlife/tourism, he thought that people would voluntarily move from this zone if developments projects were sited in agricultural zones. I am not aware that Government took any action on Albrecht's recommendations.

The Project also provided finance for graduate study by three Zambian rangers and built a new Command Headquarters in Chipata (FAO 1973).

The Project tried to fulfil the original request from Government to recommend ways in which wildlife in the Luangwa catchment could be utilised. The limitations of the Project's effectiveness were in large measure due to the restrictive terms of reference. The EPTA team and the Department ignored the advice of the Special Commissioner for Natural Resources (see above) to broaden the perspective of land-use planning and avoid 'special pleading' for game conservation. Other than the reports of the Department's wildlife economist, (Stier 1973a; Stier 1973b; Stier 1973c), the Project contributed little work on the economics of different forms of land use. Furthermore the absence of sociologists from the Project was a serious omission which must have reduced the appreciation of the importance of local opinion within the Project. The FAO Project cannot be held responsible for the complete break with the historical tradition of involving the Native Authority, renamed Local Authority in any discussion of game laws and planning initiatives which took place after Independence. This tradition was replaced by one in which benefits from wildlife came to be the currency of political patronage (Gibson 1995).

10 Epilogue, 1974-1992

As an epilogue to this account of the history some of the more recent events are summarised.

The FAO Project ended in March 1973, and the pace at which expatriate staff were being replaced by National staff accelerated from that date. However National resources proved to be hopelessly inadequate to permit the Department to cope with the vastly increased poaching. The existing approach to wildlife conservation and its acceptance by local people began to be questioned (Abel and Blaike 1986). Three externally financed conservation or research orientated projects were active in the Valley at various periods over the next twenty years. These were 'Save the Rhino', SRT, 'Luangwa Integrated Rural Development Project', LIRDP, and 'Administrative Management Design for Game Management Areas', ADMADE. A brief summary of these projects follows

10.1 Save the Rhino Project, SRT

P.S.M. Berry had left the Department as Chief Ranger in February 1973 and became Safari Manager at Mfuwe Lodge until May 1976. (Incidentally it was Berry who started night viewing drives in 1975, the Department had not permitted them previously). In May 1976 he joined Norman Carr at Chibembe and built for him Chinzombo safari camp in 1977. Berry was thus well placed to observe the very great increase in poaching within the Park which had followed the almost total breakdown in the operations of the Department due to inadequate funding, surfeit of firearms in some sections of the populace, and general political turmoil in the surrounding countries (Leader-Williams et al. 1990). Most of the

Department's camps around the periphery of the Park were closed because they could no longer be serviced, and the fire power of the guards no longer matched that of the gangs of poachers. Norman Carr and Berry now proposed a scheme to assist the anti-poaching arm of the Department primarily to protect the major targets of the poachers, the rhino and elephant. The 'Save the Rhino' project was established with the assistance of the International Union for the Conservation of Nature, World Wildlife Fund, wildlife artist David Shepherd and the naturalist Peter Scott. With the funds provided by these organisations and individuals, together with those raised locally, Berry was appointed to raise an anti-poaching cadre to conduct mobile patrols of Wildlife Scouts, seconded from the Department, and to assist with research projects (Leader-Williams et al 1990; Rosser 1989). However, despite these anti-poaching activities by the early 1980s the rhino populations had been very greatly reduced (Leader-Williams *et al* 1990). In order to raise funds for this project Norman Carr donated Chinzombo Lodge, and Berry then managed this on behalf of 'Save the Rhino' Project under a local Board of Trustees.

Detailed reports and accounts of this project have not been analysed for this account as I could not obtain them. However, it is an inescapable conclusion that although the Project failed in its major objective of protecting the rhino it did help to focus the attention of the international community on this and other conservation problems. The Project had relied on traditional conservation techniques, that is on intensive anti-poaching patrols and other police methods. In this it differed from the two projects which now followed.

10.2 Luangwa Integrated Rural Development Project, LIRDP, and Administrative Management Design for Game Management Areas, ADMADE.

The establishment, programmes and effectiveness of these two internationally funded projects have been described by Gibson (Gibson 1995). Both owed their origin to a Lupande Development Workshop held at Nyamaluma Camp in September 1983. This workshop was organized by D.Lewis, an American investigating conservation problems in Lupande GMA, hosted by the Department and attended by a group of Eastern Province Land Use Planners. All participants agreed that a new approach to wildlife conservation was required, but two different factions emerged; one group proposed a large scale project that would include all natural resources, the other, which included the Department, proposed that wildlife conservation remain the responsibility of the Department but that local participation in the management of this resource should be greatly increased. The former approach led to the formation in 1986 of LIRDP, which enjoyed the patronage of President Kaunda, and was financed by the Norwegian Government, the latter to ADMADE financed by USA. President Kaunda, personally, and his Government generally had been criticised by the international conservation community for their perceived failure to control poaching. The ready acceptance by Government of these two projects might have been a response to this criticism.

ADMADE was seen by Gibson as an attempt by the Department to thwart the attempts of LIRDP, dominated by expatriates with the backing of President Kaunda, to establish control over wildlife management in the Valley. It was established after the apparent success of a pilot scheme, the Lupande Development Project which started in 1984, to try to solve problems of wildlife utilization in that area. The pilot project was granted a safari hunting concession, it charged \$ US 20,000 for each 14-day safari, and used these fees together with those generated from culling schemes and local hunting licences to establish a Revolving Fund to finance itself and for the benefit of the local community. (Some Departments and other public agencies had, since the early 1980s, been allowed to collect and disperse their own funds rather than pay them to Government general-revenue. Gibson wrote: "*Revolving Fund managers rarely submitted annual reports.*" and quotes a Ministry of Finance official: "*...due to a lack of oversight many of these revolving fund managers became wealthier.*"). Under the Lupande project local residents were engaged as 'village scouts', a 'cropping station' was built to provide local employment and meat, the local communities received a large percentage of the profits, an approximately equal amount was reserved for management and smaller amounts allocated to the Department. The Department declared the pilot project a success, claiming

that within three years poaching had declined by 90% and that the village scouts were well motivated. In 1987 the Department adopted the Lupande Project's design as its new policy and in the following year established a national programme, ADMADE, for selected Game Management Areas. Under this programme Wildlife Management Units and sub-authorities were established, each locally managed. ADMADE was financed by USAID. Gibson quoted highly critical comments of subsequent reviews of the project, these were that ADMADE's data on animal populations were unreliable, it produced no evidence for reported declines in poaching, had not established any self-sustaining wildlife management programmes, its Revolving Fund was in disarray, and there were large amounts of missing monies (Gibson 1995).

Subsequent to the Lupande Workshop in 1983 the National Commission for Development Planning invited NORAD, the Norwegian Development agency, to prepare a feasibility study for an integrated development project in the valley. This was carried out by T.Larsen, a Norwegian wildlife Biologist and F.B.Lungu, a Biologist in the Department. The consultants proposed a project, LIRDP, that would manage all natural resources in the Lupande GMA, as revenue from wildlife and tourism would be essential for the success of the project the South Luangwa National Park was included in its area. During its first phase, 1986-1987 R.H.V.Bell, a wildlife Biologist, recruited from Malawi, and F.B.Lungu were appointed co-directors, the management structure was defined and work programmes established. The management structure was complex, there was a Steering Committee the Chairman of which was President Kaunda, an Advisory Committee, and a series of Technical Committees; there were also Local Leadership sub-committees with ward and branch sections because local involvement was a key concept. A 'Revolving Fund' was established by the Ministry of Finance in March 1987, the two directors controlled the project's funds. NORAD agreed in October 1988 to fund the project in part. In Phase 2, July 1987-December 1992, the project attempted to implement development activities in the fields of land-use planning, road and bridge construction, co-operatives in various fields, wildlife conservation and tourism. The first independent Review Mission, September 1989, drew attention to the lack of inputs from experienced resource economists or rural development specialists and that the expected level of future revenue was unrealistic. This lack of economic analysis in the preparation report was also noted by Barbier (Barbier 1992). To an onlooker it appeared that there was considerable friction between ADMADE and LIRDP, and that the latter had a dictatorial approach to Government departments. A second review carried out in August 1990 was also highly critical of the project, but a third review, in August 1991, reached more positive conclusions. However attempts by LIRDP to establish profitable enterprises were short lived, these projects included a grain mill, a safari hunting operation, a tourist camp and a 'bus transport company. All failed. The 'bus service was suspended and, it was rumoured, then sold. In the event, LIRDP became a contentious subject in the 1991 multiparty election, and, following the defeat of President Kaunda, LIRDP was placed under the Ministry of Tourism. Bell and Lungu were replaced by a single director from the Department.

11 An historical perspective

There are suggestions in recent literature that Game Reserves and Controlled areas in Zambia were established by the Colonial administrations of Northern Rhodesia without consideration of the needs and requirements of local people and that people were forced to leave their villages when Reserves were established (Barbier 1992; Adams, McShane 1992). More seriously, because such suggestions are used to justify large amounts of development money, they are found as allegations in documents published to justify the presence and to explain the policy of Internationally funded projects. Thus an ADMADE document, stated: *"The game laws enacted by the Colonial government discriminated against Africans, many villages were forcibly removed from ancestral areas to make way for large Game Reserves established by Government decree. The system under which wildlife utilization was initiated in both Game Reserve and Controlled Hunting Area favoured white settlers. Because this system discriminated against them...some resorted to hunting in defiance of Colonial laws, herein are the origins of the much publicised poaching problem."* (Mwenya, Lewis, Kaweche 1990). The sections above have detailed that villages were not forcibly removed from the areas which became Game Reserves and that Controlled Hunting Areas were specifically established to permit utilization of wildlife for the direct benefit of the inhabitants.

Further it appears to be a common assumption that the people of the Valley had traditional and well established means of wildlife management, and that these traditions were ignored by Colonial administrators when Reserves and Controlled Areas were set up. This assumption, together with the administrators' supposed ignorance of the fact that local people derived benefit from wildlife, is said to be the reason why the people have ignored the Game Laws. The general thesis of these critics is that effective conservation is possible only if game populations are managed by local people. This was strongly expressed in the reports of consultancies and conferences which preceded the establishment of two projects, LIRD and ADMADE, in the valley

A comparison may be made, but rarely is by advocates of local management, between the development of wildlife conservation in North Western Rhodesia and in North Eastern Rhodesia. When the BSA Co administration was established in the former the control of wildlife was largely retained by the local people, and central Government did not obtain administrative control over wildlife in Barotseland, which represented most of North Western Rhodesia, until 1970, and the problems there were then found to be very similar to those elsewhere. Also, the traditional annual lechwe hunts, the 'chilas', which the Ila people conducted on the Kafue Flats were allowed to continue until 1957. The Department stopped them then because of mis-management problems. This also happened with the traditional Namwala buffalo hunt which was discontinued in 1955/56.

The mid-Luangwa Valley is an appropriate area in which to examine the thesis that the supposed failure of wildlife conservation is directly attributable to the Colonial policies of the past which supposedly denied people access to subsistence hunting. Also that by allegedly removing people by force from Game Reserves a climate of opposition was created which led to intensive poaching within the Reserves.

The South Luangwa National Park on the west of the Valley and the Game Management Areas adjacent to it provide examples of the range of legislative and administrative actions undertaken by various forms of Government in the past to conserve or utilise wildlife. As the history presented here shows, the thesis that Colonial administrators did not involve villagers in the development and management of natural resources in the mid-Luangwa is wrong.

Throughout the 19th century there could have been no significant control of hunting by the local residents of the Valley since Portuguese and Chikunda hunters from the Zambezi Valley dominated the area, see sections above. In the second half of the century the Valley was also subject to raids from the Ngoni who settled on the eastern plateau following their invasion from the south. Arab slave traders and their African allies were also active in the Valley until the 1880s.

Valley people lived in large stockaded villages. Following the Anglo-Portuguese treaty of 1891

Following Independence in 1964 the new Government generally continued to implement the wildlife conservation policies it had inherited (Kaunda 1964). (Although previous wildlife conservation policies, and virtually all conservation laws of other Departments—indeed all laws—were strongly opposed during the pre-independence political struggles). The National Parks and Wildlife Act of 1967 expanded and did not differ greatly from Colonial legislation and continued the existing policy of central Executive control. More resources were now allocated to the Department in the First National Development Plan in accordance with the general policy of Rural Development adapted by the new Government.

Why was the Colonial conservation policy continued? Marks wrote that President Kaunda by late 1966 was convinced that all wildlife should be protected and conserved whereas prior to 1964: "*Kaunda enthusiastically encouraged his constituents, largely rural in settlement and orientation, to kill any wild animal they wished.... (and said that) attempts by Europeans to restrict the taking of any wild animals was culturally and legally absurd.*" (Marks 1984).

Marks implied that President Kaunda's conservation policy was very strongly influenced by 'expatriates' of the Department working in the valley, particularly by Warden J.M.C.Uys in 1965-66 (Marks 1984). (Uys was actually a Zambian whose grandparents had settled in the country at the turn of the century, President Kaunda's father was born in Malawi). I was working at Mfuwe at that time and Uys was a great friend of mine, he and the President certainly spent many hours alone with each other in the Reserve whenever the latter visited, but Uys had the highest regard for the President, especially for his deep knowledge of and approach to wildlife conservation. I consider it most unlikely that Marks's interpretation is correct and believe that the President's views on wildlife conservation were sincere and long held. Gibson stated that President Kaunda reciprocated Uys' respect (Gibson 1995).

There were of course great changes throughout Government after Independence but, because I was personally involved, I cannot make a detached analysis of events at that time, some were frustrating but more were stimulating. The political implications of wildlife conservation following national Independence have been analysed by Gibson (1995). The latter appears to be based on the assumption that wildlife affected most Zambians and that wildlife policy was vital in Government strategies. However, Gibson appears not to have understood the wildlife policies of the Colonial administration. Thus, commenting on the 1968 National Parks and Wildlife Act of 1968 and the subsidiary legislation, Gibson wrote: "*Like their colonial predecessors, the new governments's administrators shunted aside calls for granting locals access to wildlife*".

My own impression is that the urban population, which constitutes the majority, is totally uninterested in wildlife conservation, and a similar attitude is widespread in those rural areas that do not have significant populations of large mammals. I also found when I was working in the Department of African Agriculture, 1959-1965, that most farmers favoured complete destruction of any animals likely to damage crops or livestock. A survey carried out by the Provincial Planning Unit in the Mambwe area of the Valley in 1990 found that almost half the people identified lack of food as their most serious problem, nearly a quarter said lack of good water, the same fraction identified lack of transport, and the remainder wanted more implements and other inputs for farming (personal communications LIRD staff). The absence of both health clinics and schools from this list is surprising. However these six problems—food, water-supply, transport, farming support, health, education—are what anyone would assume after the most cursory of visits to the Valley. And yet the stimulus for the last development project was stated to be: "*when concern about the loss of Luangwa's famous elephants and rhinos was growing (officials) started to discuss ideas for a project to combine wildlife protection, resource conservation, effective land use planning and development to meet the needs of local people.*" (Unreference LIRD project document). The primary concern of the proponents of LIRD was for wildlife even in the inhabited areas where the other immediate requirements of the people were glaringly obvious.

Gibson wrote that political patronage was exercised over the appointment of junior staff such as

Game Guards (Gibson 1995). This has been confirmed by P.S.M. Berry, who was at Departmental H.Q. in Chilanga and responsible for recruitment (personal communication), but determined and violent attempts, as I witnessed, by local UNIP officials at Mfuwe to dismiss existing staff who were neither Civil Servants nor Party members were firmly rebuffed by regional Party officials. (In localised areas of the mid-valley there was considerable opposition to Government from the Watch Tower Sect and others. In the February elections of 1969 there was much hooliganism in and around Chipata, and the result for that constituency was declared null and void, entailing a second election).

After Independence there were changes in work practices and local examples of lax discipline leading to accidents to vehicles and unexplained absences from the work place. There was also an influx of expatriates with a different, and frequently improved, approach from that previously practised.

Generally, the first few years of Independence were very positive and encouraging ones for officers working in the field 1964-1971; new funds were available, and great emphasis was placed on the technical and professional training of staff. There was, though, increasing political rather than technical interest in the day to day working of the Department at its Headquarters; three personal examples may be given to illustrate the flavour of the period: the decision to cull Kafue lechwe was made in the Ministry without any reference to the Department; Government broke the employment contracts of long serving officers while admitting their exemplary service, and filled the resulting vacancies with other expatriates thus ensuring that experienced staff were not available to guide the newly qualified Zambian staff; the Minister of State called a public meeting of junior staff at which he invited people to denounce any 'racist' senior staff (The Permanent Secretary later apologised to the Director). Later and wider implications are discussed in the very thorough analysis of Gibson (Gibson 1995).

11.1 Game Management Areas

The main concern of the Colonial administration from 1924 was the welfare of the people, see sections above. If wildlife became a nuisance it was shot out in inhabited areas, the policy was to separate people from protected wildlife in Reserves. Following the designation of Controlled Areas, the original name for Game Management Areas, in 1938, special regulations were applied which permitted local people to hunt or otherwise utilize game animals, but this did not preclude agricultural or other development. To the Provincial Administration game was a bonus for the people not a necessity or a source of funds to finance other developments, people came first, game second. This attitude often led to controversy between the Provincial Administration and the Department.

In the Controlled Areas on the east bank and in the Munyamadzi Corridor the Colonial Administration had ruled through the Native Authority. However the Department had no influence or control over methods of land use. Conversely the Controlled Areas it established were generally not favourable for agricultural development, hence the Department of Agriculture had little interest in them. The situation was that there were large areas of land which the Department declared to be Controlled Areas but in fact the Department was so small, under-financed, and generally ignorant of land-use practices it could not 'manage' them. This did not prevent the Department, and Government, from claiming that the Controlled Areas existed to conserve wildlife for the benefit of the inhabitants. In reality Controlled Areas were merely areas which the Department considered had significant numbers of game animals. It did not have the resources to do other than operate crop protection measures and largely relied on Tribal authorities to police Game regulations.

Under the Game Ordinance of 1941 the issue of hunting licences was a responsibility of the NA, and it received a large proportion of the revenue from their sale. On the east bank the NA also received revenue from an accompanied hunting scheme for visiting hunters, and a tourism promotion scheme. Nevertheless, by 1954 control of hunting by all NAs had become so lax that a new Ordinance was passed under which central Government was given more control, sections above. This alteration was opposed by many officials in the Provincial administration. It did not lead to more active management of wildlife by the Department which, in 1958, suffered greatly from financial cuts.

When I was in the Department as a Biologist and subsequently as Chief Wildlife Research Officer, from 1965-1973, most of the Department's activities were in the Reserves, relatively little work was done in the GMAs other than anti-poaching patrols, which were chiefly aimed at controlling export of meat from the area by mounting road blocks, and a limited amount of education work. Hunting quotas were set on previous years' results and the most cursory of aerial surveys. With limited staff, priority was given to the Reserves.

From the mid 1970s there were severe economic problems in the country and political turmoil in some of its neighbours. Government funds were very restricted. International prices for rhino horn and elephant ivory rose dramatically. Consequently there was a vast increase in poaching from about 1974 which completely overwhelmed the Department. Rhinoceros populations were virtually exterminated and elephant populations greatly reduced. Effective government control of poaching was not re-established until 1987. At the time there was an increase in foreign aid both directly and in the control of international trade of wildlife products. Foreign financed development programmes continued to advise and implement wildlife utilization schemes but these were now based on management by the local community (Kiss 1990; Barbier 1992). These programmes were not only funded from abroad but also came with an inflexible premise that wildlife utilization was requisite for successful and sustainable development in the Valley. Unfortunately the discussions of conservation mainly ignore or misrepresent the history of the Valley. With the concurrence of government, and without consideration of the past experiences, it seems that present policy is to recreate a form of management of wildlife in the GMAs through the local administration which is very similar to that practiced following the establishment of Native Authority control and which continued until its failure in 1957 led to more central Government involvement. It may be that the organization, honesty and efficiency of Local Government has improved in later years, but this needs to be established without reference to Community-run schemes in other countries because of differences in local Community structure and organization. Wildlife may be a publicly owned good, but it is coveted by individuals, and few have scruples about stealing from the public!

The economic value of wildlife populations in inhabited areas outside Reserves and whether people are better off with or without them will not be resolved without a thorough and unbiased socio-economic analysis of the history of the valley together with a survey of methods of land use. The basic question that needs to be answered is whether the current privileged position given to wildlife conservation is justified over other aspects of development? It is unfortunate that sociologists and economists were not directly employed in the planning of development schemes based on wildlife from an early stage. Further, academics and others from outside the Department were not encouraged or offered facilities to investigate economic aspects of wildlife management at the village level, and this is even more surprising in view of the very strong Zambian tradition of applied sociological research. Marks did study the hunting culture of the Valley Bisa but he confined his research to a very small area around Nabwalya and was not privy to development plans for the Valley (Marks 1976). (Although he acknowledges the interest and assistance of the Department in his work he believed that it was not advisable to be seen to be too closely associated with us as he wished to retain the confidence of the villagers [Personal communication at Nabwalya 1966]).

The Colonial Government did engage F. Fraser Darling as a consultant in the 1950s to advise on wildlife policy. His report to Government was later published as a book (Fraser Darling 1960). Fraser Darling's African diaries have also been published (Boyd 1992). Boyd gives one interpretation of the value of Fraser Darling's consultancy. I do not agree with Boyd and now present an alternative view.

The Englishman F. F. Darling, or F. Fraser Darling as he preferred to be called, was a prominent conservationist and publicist in Britain and America in the 1930s and in the next decade he became well known as a writer of books on Natural History. In 1969 Fraser Darling was appointed to the Council of the British Nature Conservancy and then to the Royal Commission on Environmental Pollution. He delivered the 1969 Reith Lectures and was knighted in 1970 (Darling 1969). His approach

to 'human ecology' had aroused interest and great enthusiasm in the USA, and according to the editor of his African journals he saw himself as: "*—working in the middle ground between ecology and animal behavior, political actions were as potent ecological factors as climate.*" (Boyd 1992). Boyd also wrote: "[Fraser Darling's] *Journal is full of intuitive responses to the human situations in which he finds himself, revealing his preoccupation with the dignity of life, the gifts of personality, the quality of craftsmanship, the absolute beauty of nature*". Later Boyd quotes Simon's (Simon-*Between the Sunlight and the Thunder*) opinion that: "*In the late 1950s and early 60s Fraser Darling dominated the field of African ecology*". Darling made only brief trips to the continent—to be exact between 1956 and 1961 he spent approximately 5 months in Northern Rhodesia during 3 visits, 3 months in Kenya on 3 visits, and made a 3 month long tour in Sudan. And yet it is claimed: "*Sir Frank Fraser Darling spent many years surveying the wildlife resources of Africa*" (Publisher's book cover, Boyd 1992).

R.G. Attwell, the Provincial Game Officer Eastern Province, whilst on sabbatical study leave in the U.K. met Fraser Darling and instigated a consultancy for him to Northern Rhodesia and East Africa funded by the USA Conservation Foundation. The terms of reference were wide but, in general, Fraser Darling was asked to report on the status of the larger animals, the condition of their habitats, conservation policy, land use policy in relation to wildlife conservation and African nutrition in Northern Rhodesia. In the rainy season of 1956 Fraser Darling went to the Mnyamadzi Corridor from Mpika accompanied by W.E. Poles and I.R. Grimwood, Senior Ranger and Deputy Director of the Department respectively. From Fraser Darling's and Poles' diaries it appears that Fraser Darling either arrived in the Territory with pre-formed and strongly held views on Africa and Africans, views remarkably similar to those of Poles—authoritarian and dogmatic— or rapidly acquired them from Poles and Grimwood or other Departmental staff soon after his arrival. Thus shortly after his arrival in Africa and on the first day of his field trip out of Mpika towards the Muchinga escarpment he wrote: "*The game has been hunted out by Africans with muzzle-loading guns. Northern Rhodesia allows Africans to have these and the effect on game over large areas has been disastrous. The African is incapable of conservation sense and the Administration here is exceptionally soft towards the African people, whose population is increasing rapidly and the habitat will not withstand the hunting pressure. European hunting is no serious factor now.*" (Boyd 1992). When he wrote this he could have had no personal knowledge of African customs, techniques of hunting, habitats, agricultural systems, or the work of the Provincial Administration. Nor would he or any of his party have had any accurate information on the recent changes in the numbers status of game animals in that area. Fraser Darling is here merely repeating the opinions of Poles. The journals continue in this vein, they detail the journeys he made but there are no reference to any enquires he made about the 'human ecology' of the villagers. (He did attend one meeting which Poles held with Chief Nabwalya at which the Chief was firmly warned that the meat and tusks of any elephant shot in defence of crops must be sent to Poles at Mpika as they were Government property. During this lecture the people at the meeting could actually see the dead elephant shot by Poles on licence as a Ranger's 'perk'. Fraser Darling made no comment!).

Fraser Darling's book '*Wildlife in an African Territory*', is virtually identical to his consultancy report to the Government of Northern Rhodesia (Fraser Darling 1960). Almost half the book is made up of factual accounts of his journeys and an abstract of Trapnell's classic descriptions of the habitats (Trapnell 1953). Although Darling was acclaimed as an authority on 'human ecology' this subject is presented in only 5 pages of the book—and these mainly concern the Copperbelt—they contain such comments as: "*The conditions of life in the villages are primitive subsistence conditions.....but quite definitely degraded by the effect of money, which allows the discipline of a subsistence stage of culture to be shed.*". (Darling apparently believed that people should not be paid for work until they had been taught how to spend their wages, until then they should be content to follow their traditional village life). His comments on land-use policy, a subject on which he was considered an authority, were presented on only one page and in my opinion are trite.

He concluded that Government's interest in wildlife conservation had waned in the past twelve

years-giving no justification for this statement. The 6 recommendations he made are contained in 3 pages. They were that a high-level land-use commission be appointed; that the Provincial Administration and the Police be given a formal directive on game policy and conservation; that the administrative and scientific departments should confer to arrive at a much firmer policy on control of fire and that this policy should be implemented with firmness; Kafue National Park should be given proper status, certain other reserves should be given the status of wilderness areas; immediate steps should be taken to conserve both the red and black lechwe, a research project for the black lechwe should be carried out by the Northern Province Development Commission in co-operation with the Department; the Department should aim at recruiting men of high qualifications and impeccable character, present administrative duties are too heavy for biologists, some biologists should be employed as specialists-one is already an authority on small mammals, another on birds, eventually research on invertebrate ecology and conversion cycles will be necessary; budgetary provision should be made "*for a vigorous African educational policy in conservation for the desired end of conservation-mindedness will not be achieved merely by the repressive measures which are unfortunately necessary meantime.*" (Fraser Darling 1960).

Fraser Darling's recommendations were very general, contained nothing original, and made no suggestions on how they could be implemented. This is surprising from one with a reputation for *intuitive responses to the human situations*. However he had no prior experience in any African Territory, appeared to have believed anything told to him, to have questioned little and understood less. His journals are little more than accounts of what he saw and of social outings; he did not meet African villagers as part of his consultancy nor did he query their wants and requirements. Neither had he obtained the views of experienced ecologists in the Forestry or Agriculture Departments. (C.G.Trapnell, who had pioneered the scientific study of the relationship of African farming systems and ecology in Northern Rhodesia when he started his land use surveys in 1933, was by then in Kenya). He appeared not to appreciate the political sensitivities of the time nor the fact that the Administration could not rule by diktat but only with the co-operation of tribal authority. His recommendations were not new to Government, and were little more than idle platitudes. There is no mention in any detail of the agricultural systems and very little on the way of life of the rural African or on how Trapnell's work on the ecology of African farming systems (Trapnell 1953) could be carried forward with greater involvement of social anthropologists. Rather than attempting to bring to the attention of the Department the needs and requirements of the local people, Fraser Darling appears to have uncritically accepted the opinions of some of those officers he met in the Department. For example he appeared to advocate compulsory destocking of domestic animals and control of fire in tribal lands. He seemed to have missed entirely the great importance of wildlife to the people in the Munyamadzi Corridor, and he did not urge W.E.Poles to adopt the approach of Departmental staff in the Eastern Province—that is to try to gain the confidence and trust of the people rather than to impose restrictive laws, although he did propose that an education unit be formed.

Superficially the proposal that the Departmental Biologists should be relieved of administrative work looked sound and was in fact what happened. The effect of this change, however, was that the Biologists, officers on the Professional establishment, were placed under the control of an officer on the Technical establishment. In practice this meant that the Biologists were isolated and could have little influence on the Department's actions should their proposals differ from those of the administrators and (unqualified) Wardens. In no other Department would this arrangement have been operated. (In the Department in which I originally worked most Rangers and Wardens of the Department were regarded as eccentrics, a view most of them seemed to delight in).

Boyd, the editor of Fraser Darling's diaries (Boyd 1992), does not appear to have appreciated any of these points and when I put some of them forward to him suggested that I am a *narrow specialist* whose views cannot be equated with such a *renowned generalist* as Fraser Darling (Boyd 1992). (Boyd in this instance appears to be unaware of the methods of selection, training and duties of officers in the Colonial Agricultural Service. The range and type of work which officials in all 'natural resource' departments in Northern Rhodesia undertook was wide, to describe any of them as

narrow specialists is absurd). Boyd believes that Darling's Report had a great influence on Government policy. I do not believe this. It cannot be true because in 1958 the Department suffered drastic cuts in finance and many staff declared redundant. This was not a direct result of Darling's consultancy but the fact that the cuts were so severe indicates that Government ignored him. It is true that his unusual and ultimately disastrous suggestion that professional Biologists be relieved of day-to-day management of the Reserves and his support for culling were adopted, although his support for the latter was never quoted at any of the numerous and contentious meetings I attended on the subject. I have been unable to find any evidence in the archives, recall from personal experience or obtain from talks with others who were working in Zambia at that time, that his views had any other influence whatsoever (Director J.E. Clarke, Deputy Director W.F.H. Ansell, Chief Ranger P.S.M. Berry, Chief Game Officer W.R. Bainbridge, Development Officer L.D.C. Allen, Ecologist W.C. Verboom, personal communications). In my opinion this was simply because Fraser Darling said or wrote little that was not already known, his comments were naive and shallow and he failed to make recommendations which could be implemented with the resources available. Moreover, of those officers closely associated with Fraser Darling who, had they stayed, might have been expected to try to implement any unpublished suggestions he had proposed, W.E. Poles was retrenched in 1958, C.A.R. Savory left in 1958, I.R. Grimwood left in 1960 and R.I.G. Attwell left the country on Independence in 1964. He did spend some time in the field with the late J.M.C. Uys, who latter became Warden, Luangwa Command, but Uys had nothing positive to say about Fraser Darling or the consultancy when I discussed it with him in the Valley, quite the reverse.

It must have been obvious to Fraser Darling that the Department was staffed by two types of field staff—the 'authoritarian', representing the majority, and the 'scientific'. The former were at loggerheads with the Provincial Administration over wildlife in Controlled Areas as all too often these types of Ranger completely ignored the legitimate requirements of the villager. One wonders why Fraser Darling did not react as a modern consultant would have done and recommend that detailed studies were required on tribal hunting and methods of wildlife utilization. Government did not have the capacity to undertake these studies so one would have expected Fraser Darling to assist through his academic contacts.

The Northern Province Development Scheme (Watmore 1956) was under active consideration by Government, and was implemented from 1958, when Fraser Darling was in Northern Rhodesia but this large development scheme completely ignored wildlife although Mpika District is rich in this resource. I believe, indeed I was told by the Director of that project, that the reason for this was because the areas of education, agriculture with forestry and fishing, and communications were regarded as priorities.

'*Wildlife in an African Territory*' (Fraser Darling 1960) is a useful summary for the amateur naturalist, although it is opinionated and lacks factual data, of the status of animal populations but it fell woefully short of being professionally useful to the Northern Rhodesia Government, and Fraser Darling's consultancy was largely ignored by those working in the field, exactly as were his earlier West Highland Survey in the 1940s and his later report to the Kenya Government on the Mara Plains. The consultancy was a valuable opportunity generously financed by American conservationists but tragically wasted in that it did not bring to the attention of the Department the sociological aspects of wildlife conservation, in which Fraser Darling was supposed to be an authority, and to present it in any other light, as Boyd does, is highly misleading. The immediate period before National Independence was a crucial one for the Department. Had Fraser Darling been more open minded then the history of the next decade might have been quite different.

(P.S.M. Berry has drawn my attention to a comment by one of the Biologists of the Department C.A.R. Savory, who accompanied Fraser Darling during part of his survey, which refers to a discussion they had on the '*understanding and application of our ideas by politicians*' [Savory 1988]. This gives the impression that Fraser Darling was more aware of political realities than he expressed in his Report but does not explain the absence of them in this document). I believe that

senior officers of the Department did not expect Fraser Darling to recommend anything other than what they themselves suggested, and that they hoped Government would listen to an 'international authority'; if this ploy failed they could still look forward to an entertaining book with some publicity value.

Darling's consultancy was the first and typical of a few others which followed in the next decade, in which very eminent people and 'experts' in various fields would appear and pronounce instant solutions to local problems about which it was only too obvious they had little understanding. They were a particular nuisance to those working in the Valley during the controversies over elephant culling. One of the more bizarre was that of the visit of the eminent British naturalist, author and artist Sir Peter Scott who visited the Reserve in 1969, apparently to advise Government on elephant culling and, it was rumoured, the organization of the Department. (It was widely believed within the Department that the visit of Scott had been promoted by one or more officers who had personal contacts with Ministers, rather than by the Department, in order to investigate the working relationships of senior staff in the Department, certainly Scott was very interested in these but Biologists in the Reserve refused to discuss them with him. The Chief Game Officer was replaced in 1970).

Current policy regarding Game Management Areas appears to be strongly influenced by the ready availability of expatriate funding for wildlife projects compared with that on offer for other aspects of rural life. In spite of the many past efforts to find ways to engage local residents in wildlife conservation what has bedeviled land use planning in the Valley is the lack of recognition, in so far as the allocation of development funds is concerned, that the majority of the local people are subsistence farmers. Why should these have to rely on wildlife for development funds?

The issue needs to be decided whether the Valley is to be used for the conservation of its fauna with the interests of the people fitted in, or is to be used for developing the way of life of the local people, conserving the fauna consistent with that main purpose if the local people so desire. This is the basic question first posed in 1960, but it is one that has never properly been addressed. Virtually all the outside consultants who have been involved have been guilty of that 'special pleading', for wildlife at the expense of the people, of which Bullock and Carr were accused in 1962 (Anon 1962).

Thus, because an area is a declared Game Management Area, proposals are made, for example, that involve the recruitment and training of 'Village Game Guards'. Conservation and utilization of wildlife has real costs as well as benefits. The economic benefits of these 'guards' are never compared with the recruitment of for example, 'Village Health Workers', 'Village Cotton Advisors', 'Village Teachers'. Safari hunting is probably the 'easiest' way to make money out of wildlife, (Steir 1973c), but is it an industry that can be organised and run by a Local Authority? It is a sophisticated industry which depends on skilled and experienced professional hunters as well as access to high quality hunting grounds. In the 1960s the safari hunting market collapsed when there was hint of political trouble. The thesis that safari hunting could be a lucrative and sustainable source of income for the rural dweller may be true but needs to be proved, as does the ability of the community to develop and manage it. There is now competition from different countries for hunting clients, and hunters may be fickle and desert Zambia just as they did in the fifties. If the monies generated are to be spread throughout the community then a proper accounting system is required. These factors must be considered and the costs of implementing them compared with those required in other forms of land use. For example some of the the Valley soils are ideal for growing cotton, and the promotion of this crop is now having some success, but relatively little attention is paid in recent development planning to this crop, nor the requirements of local people whose only source of livelihood is from their land in the Valley. Enormous sums have been and are being spent on 'wildlife' schemes with little to show other than what are really no more than pious hopes, very suspect claims, and assumptions of future success.

I suggest that in future development funds should be directed at the immediate and pressing concerns of the rural dweller-agriculture, health services, educational facilities, transport and communications.

One method of integrating hunting on the east bank would be for the Local Authority to allocate blocks of non-agricultural land to Safari Companies. Operations of such companies in the field could be controlled by whatever system is locally suitable and agreeable to central Government. The industry would finance its own projects and pay tax directly to the local community. If in fact there is a growing International demand for this type of tourism, there should be no need for Government, or any International Organization, to invest in its promotion. Should conditions be acceptable, the activity would flourish without promotion.

11.2 The National Park

The South Luangwa National Park was originally established as a 'Sanctuary' or 'Reserve' for elephants, its management and utilization thereafter conducted on the premise that it was a Game Reserve. It was noted in section 7.3 that this policy changed after National Independence. In a speech in the National assembly the Minister, S. Kalulu, said "...a National Park is not primarily a commercial enterprise but a public service similar to the services provided by National Museums and National Art Galleries." (AR1971). However the 1971 policy that the Park should not be regarded exclusively as a means of earning revenue by tourism development based on wildlife appears to have changed. The parent Ministry of the Department is now the Ministry of Tourism, and the needs and requirements of the tour operators now predominate. In other words, the present mode of 'utilisation' appears to agree more with the original objective of its establishment, namely that the Park was simply a sanctuary for large mammals, than was the policy advocated in 1971 which equated the Park with a 'museum' in which habitats together with flora and fauna were all of interest. If Government policy has changed, and the Park is being valued solely for its economic worth, it might be advisable to state it and direct investigations into market survey and investigations into a wider range of 'non-game' assets which could be utilised-hill walking, canoe trips, etc. At the same time policy on scientific research within the Park should be clarified and Government's attitude towards the international scientific community clearly stated.

The result of Park development since its establishment, especially the development of the road net-works from the eastern plateau, has been to increase the influence of the Kunda people over the Park at the expense of the historical occupiers, that is the Bisa people now living west of the Park. This came about because of the establishment of the Nsefu Reserve on the east bank. Had this not occurred and had Pitman's proposal, section 3.3, of completely separating 'people' from 'game' been followed, then the vast sums of development money wasted on trying to integrate 'game' with 'people' on the east bank might well have been devoted solely to the latter through concentration on other natural resources with which the valley abounds, notably cotton, tree-fruit production, forestry, and semi-precious minerals. It is not possible to assess the effectiveness of current projects aimed at putting control in the hands of the local population because any current success may simply result from external funding and external supervision. Only when these have been withdrawn shall we be able to judge.

The management of the Park from its establishment as a Reserve in 1938 until National Independence in 1964 was outstandingly successful, if judged on animal numbers, in that there was, in the latter years, a superabundance of large mammals. Critics maintain that this success was at the expense of the alienation of local people who re-entered the Park as soon as they could. These critics ignore the fact that successful poaching in the area to the west of the Luangwa river during the poaching *blitz* 1975-1987 was the work of well organised and well armed gangs invading from the western plateau (Leader-Williams *et al.* 1990). This poaching virtually wiped out the rhinoceros and reduced elephants in the Park from about 35 000 to about 5000. Economic decline in the country, lack of funds for poaching control, and a general breakdown of law and order meant that any system of wildlife administration would have been powerless in the face of this onslaught. In other words the people of the east, alienated from the Park or not, had no influence or control of the poachers

from the western plateau. Local poaching on the right bank of the Luangwa and the right bank of the Mupamadzi had been known and acknowledged by the Department for many years, but it was generally confined to the snaring of the smaller mammals and had little effect on the populations of large mammals in the Park. (In fact the densities of most riverine animals are greatest in these two areas). The east bank poachers, however, were mainly responsible for the elimination of the rhinoceros populations and reduction of elephant numbers in both Nsefu and Chilongozi sectors.

Recent policy seems to be to direct the proceeds of tourism from the Park to a single Local Authority (formerly Native Authority) in the GMA outside the Park in the belief that this will induce a sense of ownership and value and lead to a local conservation ethic. The historical perspective presented here does not encourage any confidence that this policy will work. There is no strong local or traditional administration in the area, groups will disagree among and between themselves. The area of the Park is large, the population administered by the Local Authority is small and scattered and communications poor, therefore it will be difficult to police any protection measures. Further, such an approach - local control - seems to deny the concept of a National asset. The success or otherwise of the policy of placing the management of a major National Park in the hands of a small Local Authority to the east of the Park which has no historical claim to the majority of the area covered by the Park remains to be seen. Meanwhile the same policy has alienated those villagers on the Valley floor to the west of the Park, the former occupiers of the Park. This may be a significant pointer as it appears to me that enthusiasm for local control could destabilise management of the Park if this alienation leads to rivalry among Local Authorities in the same or different Provinces, Local Authorities that have different tribal affiliations. Proper management of the Park, for whatever purpose, requires vastly more funds than are available at present. I have not seen details of recent expenditure and income but cannot believe that the present number of tourists can ever provide sufficient funds to maintain the airport, network of roads and bridges, and recurrent revenue for management of the Park. National or International funds will be required for the foreseeable future.

Should the safari hunting industry become established and successful on the east bank then similar hunting within the Park will sooner or later inevitably be advocated by the Local Authority. This is because safari hunting is the easiest and most efficient way to exploit wildlife. History shows that some people will favour this multi-purpose utilisation of the Park but many more will oppose it.

One possibility, to give the Kunda Local Authority access to a Park, would be to excise the Nsefu sector from the Park in the form of a 'Nsefu Wildlife Park' which could be operated entirely by the Local Authority. This was once proposed by Chief Nsefu, section 6.3. The Local Authority would have its Park on the east bank, the Nation a larger one on the west bank. The Authority would be able to manage it in accordance with whatever criteria it thought appropriate. The same approach could be applied in the Chilongozi and Chifungwe sectors, these to be managed by other appropriate Local Authorities, each Authority to be responsible for physical and financial management of its own Park.

Notwithstanding these accessions, history also supports the need to unambiguously recognize the national aesthetic significance of the remaining area of the Park so that its international value can be acknowledged. This acknowledgement demands international resources to maintain the Park as a World Heritage Site. The Department could find ways to positively encourage the international scientific community and its research staff would readily become members of it.

This principle of providing international assistance for management has been adopted by the International Climate Convention on the burning of fossil fuels, such that defined countries receive payments from the international community to maintain their forests even though the local communities support clearing. Nationalizing and internationalizing the Park would not exclude the involvement of Local Authorities, Zambian Universities and other national institutions from full participation in and leadership of Park Management.

NOTES

1 C.R.Pitman's Report

This Report is difficult to obtain, and so I present some of its more important recommendations which were followed and observations on the Valley. Pitman did not make clear his definition of a National Park and how he considered it to differ from a Game Reserve. He wrote:

"'National Park', in so far as Africa is concerned, is a catch phrase intended to arrest the eye and stimulate public interest in the fauna, though unfortunately, in its real sense owing to prevailing conditions, is inapplicable.

...Most African sanctuaries, either established or proposed, can never function as the above depicted people's playground owing to a combination of adverse factors such as climate, limitations on communications, the prevalence of malarial carrying mosquitoes and other like pleasantries.

...The underlying idea of a 'national park' as opposed to the 'game reserve' which already exists is that the former is intended to be established in perpetuity, while the latter though seemingly secure enough can scarcely be regarded as a permanent proposition.

...The park must endeavour to afford refuge to as representative a selection as possible of the local fauna, and scenic beauty is of course an added attraction. The public, as is only natural, should in the first instance not only acquiesce in their creation, but also have a very definite interest in their selection, for if the public is to find the requisite sums for their maintenance, it will desire that they are not inimical to the interests of the country, that they are readily accessible and as far as possible, self-supporting.

...In consequence a national park must not be created in any piece of waste country which happens to be not required for anything else. Parks can be successfully established only in regions where normally wild life, in variety, is reasonably abundant, and the extent of the area should cover the seasonal wanderings of its four-footed inhabitants in search of food, water and salt, as well as abnormal movements likely to result from the annual grass burning. I have been so often confronted with the idea that only land required for nothing else, both now and in the future, should be considered for conversion into sanctuaries. But, if game is worth preserving at all, it is worth preserving well.

Referring to the Hingston Report (Hingston 1930) he wrote:

"...there is for consideration the suggestion emanating from an eminent Society that: "The best solution would appear to be the creation of a South-Central African National Park at the junction of Nyasaland and Northern Rhodesia. The Nyasaland contribution to it would come from what is now the Kasunga Game Reserve. The Northern Rhodesia contribution would come from the creation of a sanctuary in the Luangwa valley which would be continuous across the frontier with the Kasungu Game Reserve of Nyasaland...the Northern Rhodesia contribution will be many times the larger of the two." This proposal I have never seriously contemplated as –

a) In East Luangwa Province it would entail the removal of nearly 70 000 of the population; and

b) The Luangwa Valley from its situation and unfavourable conditions is generally unattractive to visit, even were sleeping-sickness absent.

As it is not a feasible proposition there is no necessity to enlarge, though I agree with the Provincial Commissioner who dryly remarked that "Northern Rhodesia would provide the cage for the animals for Nyasaland to exhibit!"

...An examination of the claims of the several localities [for Parks] reveals –

a) The Luangwa Valley, in whole or part is unsuitable on account of its iniquitous climate and the prevalence of the tsetse fly –Glossina morsitans–harbouring the trypanosome of a virulent form of sleeping-sickness (or human trypanosomiasis), coupled with its general inaccessible –now and in the future– to the public, for in another section proposals are made in regard to the alienation of an area of considerable extent as a sanctuary in perpetuity, for game".

With respect to the establishment of Game Reserves he concentrated on uninhabited areas; in the Valley this meant mainly the right bank of the Luangwa river, he wrote: *"Personally I am of the*

opinion that there is everything in favour of the creation of a game sanctuary—and preferably in perpetuity—on the right bank of the Luangwa River which would embrace the greater part of the Mpika and Chinsali portions of the Luangwa Valley, as protection would thereby be afforded a wonderful quantity and variety of game including multitudes of elephants and buffaloes, and a fair number of rhinoceros, while interference with established native settlements will be reduced to a minimum if the area between the Rivers Mupamadzi and Munyamadzi, and certain populous localities at the foot of the escarpment are excluded from the reserve.

Broadly, I would suggest as game reserves, with necessary exemptions as above indicated:

That portion of the Mpika District lying between the escarpment and Luangwa River, and bounded by the Mupamadzi and Kapamba rivers approximately 1830 square miles (4739 km²) in extent. Actually this reserve should also include as much as possible of the region—mainly uninhabited—between the Kapamba River and the Serenje and Fort Jameson track (across the “valley”) as it is the haunt of a relatively large number of rhinoceros.

Part of the Luangwa boundary of this reserve is contiguous with a section of the limits of the proposed giraffe reserve on the left bank which would enable a joint reserve to be created so as to include both banks of the River Luangwa for several miles—an essential if some of the hippopotamus schools are to receive completed protection.”

Thus it appears as though he considered a Park to be a place for human relaxation and enjoyment and a Reserve a sanctuary for wildlife

Pitman toured in the Park area in July and August of 1932 in two separate journeys. The first was from Serenje along the Msoro track to Kachulu at the foot of the Escarpment, then north to Chilavi and Masyumba and Injalalli on the Kapamba river; he followed the Kapamba down to the Luangwa, crossed to the East bank, recrossed the Luangwa, above the Kapamba, and followed it downstream to Chibanda. Then he followed the track back to Serenje. The tour lasted for 16 days.

The next tour included travelling down the Munyamadzi to the Luangwa, down the Luangwa and up the Mupamadzi. His Report on these tours is the only one I know of which goes into any detail on game in the Valley at that time and is worth recounting. His general impression was that game was fairly plentiful in the neighbourhood of water, but was not very conspicuous. He was disappointed by the small quantity he actually saw—those that he did see were very shy. The greatest concentrations were along the Luangwa, Kapamba and Mupamadzi where elephant and buffalo were plentiful.

<i>Elephant</i>	<i>Often seen and heard, causing extensive damage to Mopane</i>
<i>Rhinoceros</i>	<i>Plentiful but a great deal of poaching occurring</i>
<i>Hippopotamus</i>	<i>Only 2 schools of about 8 hippos were seen in the Luangwa There were also a few schools in the Munyamadzi</i>
<i>Giraffe</i>	<i>Only saw recent spoor</i>
<i>Buffalo</i>	<i>Many seen including six herds, each over 120 strong, in one day along the Luangwa</i>
<i>Eland</i>	<i>Fairly plentiful, the largest herd was 60 strong</i>
<i>Wildebeest</i>	<i>Not seen</i>
<i>Kudu</i>	<i>Abundant</i>
<i>Roan</i>	<i>Many seen along the Luangwa, one of the most common antelope</i>
<i>Waterbuck, Zebra,</i>	<i>All common</i>
<i>Puku, Impala</i>	
<i>Lion</i>	<i>Exceptionally common</i>
<i>Leopard</i>	<i>Not seen but thought to be common</i>
<i>Hyena</i>	<i>Conspicuous by its scarcity</i>
<i>Crocodiles</i>	<i>Not often seen</i>

The Report also contains comments on other mammals, reptiles and birds, and the lists presented were used as the basis for subsequent checklists. Tsetse fly was widely distributed but sparse. He thought that the heat and the prevalence of tsetse fly made it most unlikely that a National park: *"could become an attractive place to visit. The climate is notorious –the dry season heat is terrific and in the rains for several months the low lying portion of the Valley, constituting the greater part, is water logged."* What I find interesting about this inaccurate statement is that officials did not advise him to delete it as they must have known it to be untrue.

Pitman's map indicates three centres of concentration for wildebeeste; one on the West bank, in what is now the North Park, and two on the East bank. In the event only two areas of Game Reserve were gazetted in the Eastern Province; the Lukusuze Reserve and the Chilongozi Sector (the 'Giraffe Reserve') of the South Reserve. I have found no evidence in the records that Pitman's 'Wildebeest Reserve' was ever considered, but have the impression that the North Reserve was thought to offer this species adequate protection.

2 Comments on safari hunting

There were comments in the Tour Reports of District Officials on the resentment of villagers towards the presence of expatriate hunters and the distribution of meat. Thus H.T. Bayldon, a District Officer after observing the camp of an expatriate hunter and its enormous quantity of drying meat covering an area 60 m x 60 m wrote in his Tour Report: *"It is noticeable that the villagers only receive the offal of anything else but elephant for all other meat is converted into biltong."* (ZNA Tour Report, Fort Jameson TR11/1948).

Some of the DCs were favourably disposed towards safari hunting, but the PC of the Eastern Province had reservations

The Provincial Commissioner, Fox-Pitt, minuted on proposals to ban village hunters from some areas: *"I shall see with regret the passing of the African hunter who takes great risks to make his living. His place will be taken by a different type who lives on tips from wealthy 'sportsmen'. Perhaps these tribes will be selling a valuable birthright, a school for manhood, when they hand over the Controlled Area to men who can pay big fees. One can console oneself that the legitimate hunter of today will become the poacher of tomorrow and the ancestral values of courage and forest lore will remain unchanged."* (Comments by Fox-Pitt on Fort Jameson Tour Report 6/1949).

3 Proposals for a Game Reserve

District Commissioner E. Button of Lundazi commented on the decline of game in the valley, especially of eland which the local Senga do not eat, and so its decline can be put down to poaching which increases after drought and poor crops.

On Safari hunting he wrote: *"To my mind this exposes one of the greatest weaknesses of the approach to game preservation in this Province It is a negative one of hunting parties and game allowed per person with the object of revenue from destruction. I think the approach should be one of increase and improvement and revenue not only from hunters, but from sight-seeing parties in game reserves, as it is in the Kruger National Park and the many National Parks in the United States. The revenue from these, I venture, and the trade that they produce, far exceed game licences. The reserves should be systematically improved and developed and not remain as they are at present, devoid of all improvement, a poor refuge from destruction, and a dwindling reservoir of fauna. Water conservation and control is as important in game reserves as outside, and so is improved grazing and fire control. I am confident that if extensive watering places were erected and early burning enforced in reserves, and that they were developed for the tourists traffic, there would be a rapid improvement in the game population and increase in revenue. Personally, I do not consider it of prime importance to worry unduly about attracting the 'right type of sportsmen', if there be degrees in sportsmanship or the 'better type of visitor', they will come. In this connection I would suggest that instead of proposing to build permanent hunting camps, it would be better to invest the money in developing*

reserves. Surely such hunting camps would not be a sound economical investment? They must become 'white-elephants' when the game in the neighbourhood has been shot out. They could only be used for six months a year at the most, and I think most hunters come to live in a tent and 'rough it' as a pleasant change from the normal routine of their lives." (ZNA, Lundazi Tour Report 3/1949 annexure 4 GAME).

The DC was incorrect in thinking that the Department wanted to establish permanent hunting camps, its idea was to have temporary camps moving around fixed areas.

4 Elephant Control in the Eastern Province 1943-1963

Year	Killed	Ivory/kg
1943	303	-
1944	425	7264
1945	263	3550
1946	170	1930
1947	131	2360
1948	159	2992
1949	278	6872
1950	208	5362
1951	165	4737
1952	114	2780
1953	232	6279
1954	180	3859
1955	235	5871
1956	177	4029
1957	259	5391
1958	254	12 132
1959	174	-
1960	225	-
1961	265	-
1962	298	-
1963	186	9811

(Dodds and Patton 1968)

5 Tourist Numbers 1949-1971 by camp

Year	Big Lagoon	Chilongozi	Lion	Lusangazi	Mfuwe	Nsefu	Luamfwa
1949						NA	
1950						c 100	
1951						153	
1952						154	
1953						226*	
1954		NA				NA	
1955		36				393	
1956		117				602	
1957	240	NA				531	
1958	343	168				483	
1959	398	236				492	
1960	344	257	41	22	107	326	
1961	484	317	46	21	419	369	
1962	446	392	182	175	129	410	
1963	599	347	263	218	132	548	
1964	495	301	204	173	157	428	
1965	425	282	27	320	325	516	
1966	453	213	134		616**	375	
1967	357	101	161		962	312	434
1968	505	57	239		1161	499	531
1969	379		149		933	397	431
1970	448		193		1180	485	485
1971	406		242		965	503	167
Beds	12	10	6			32	

*A new 12 bed camp was built at Nsefu on another site

Lusangazi and Lion were originally built as Departmental camps

** Mfuwe Camp with 12 beds was closed after 1965 and replaced by the 32 bedded Mfuwe Lodge from 1966

In 1971 Luamfwa was only open for 3 months due to renovations

Luambe was opened in 1953 as a Native Authority controlled camp

6 Publicity Booklets

A publicity Booklet *Game Viewing Camps of the Luangwa Valley and Eastern Province, Northern Rhodesia* was produced in 1957. The present-day visitor may be envious to note that the Black Rhinoceros: "...are widely distributed and not uncommon. Though they retire far from water by day, they may often be seen near the river in the evening and early morning". As for elephant "... it is impossible to take a mornings walk without meeting several herds".

The visitor to Chilongozi, for example, would book his room, load up with supplies in Lusaka and head for the Valley. If he was wise, he would have taken note of the leaflets warnings to: "make an early start at Kachalola" (where he would have spent the night) and: "not to leave Petauke Boma later than 12 noon on the day on which you intend to reach Chilongozi"; of course, he would have: "exercised care to get into low gear at the various drifts over the last thirty miles [48km] of road" and even more care: "in respect of elephants on the last seventeen miles [27km] of road". If staying at Nsefu, he would: "not be permitted to carry fire arms but need have no fear, the game guards may be relied upon implicitly ... as they are completely trustworthy in their solicitude for their European charges". Later, game viewing on foot was permitted at all camps for visitors over 12 years old.

7 Animals processed at Kakumbi abattoir 1965-1972 and saleable meat in kg.

Year	elephant	hippo	buffalo	impala	saleable meat
1965	27	9	33	9	12 706
1966	199	205	91	0	185 455
1967	355	213	54	0	221 982
1968	385	56	7	3	160 091
1969	442	87	27	111	166 935
1970	0	377	0	0	117 614
1971	0	366	0	0	122 750
1972	0	330	0	0	120 643

Excludes animals condemned for meat
From Steir (1972b)

8 Revenue from Kakumbi abattoir in Zambian Kwacha

Year	meat	hides	ivory	other*	total Z Kwacha
1965	3370	NA	NA		3370
1966	51 038	5316	5656		62 010
1967	72 000	40 200	6300		119 370
1968	73 511	45 000	37300	870	159 811
1969	69 000	48 000	NA	4000	119 400
1970	48 000	16 000	2000	2400	66 000
1971	48 000	22 000	NA		70 000
1972	44 071	26 000	NA	NA	70 071

* other source represents tanned products and animal fat. Bone meal and animal charcoal were not recovered

The average wholesale price of meat in Ngwee per kilo was as follows

1965-26.5, 1966-27.5, 1967-32.5, 1968-43.5, 1969-41.3, 1970-40.8, 1971-39.5, 1972-36.5.

One Ngwee is 0.01 Kwacha, in 1965 K1=0.5 pound sterling

From Steir (1972b)

9 Animal Census data

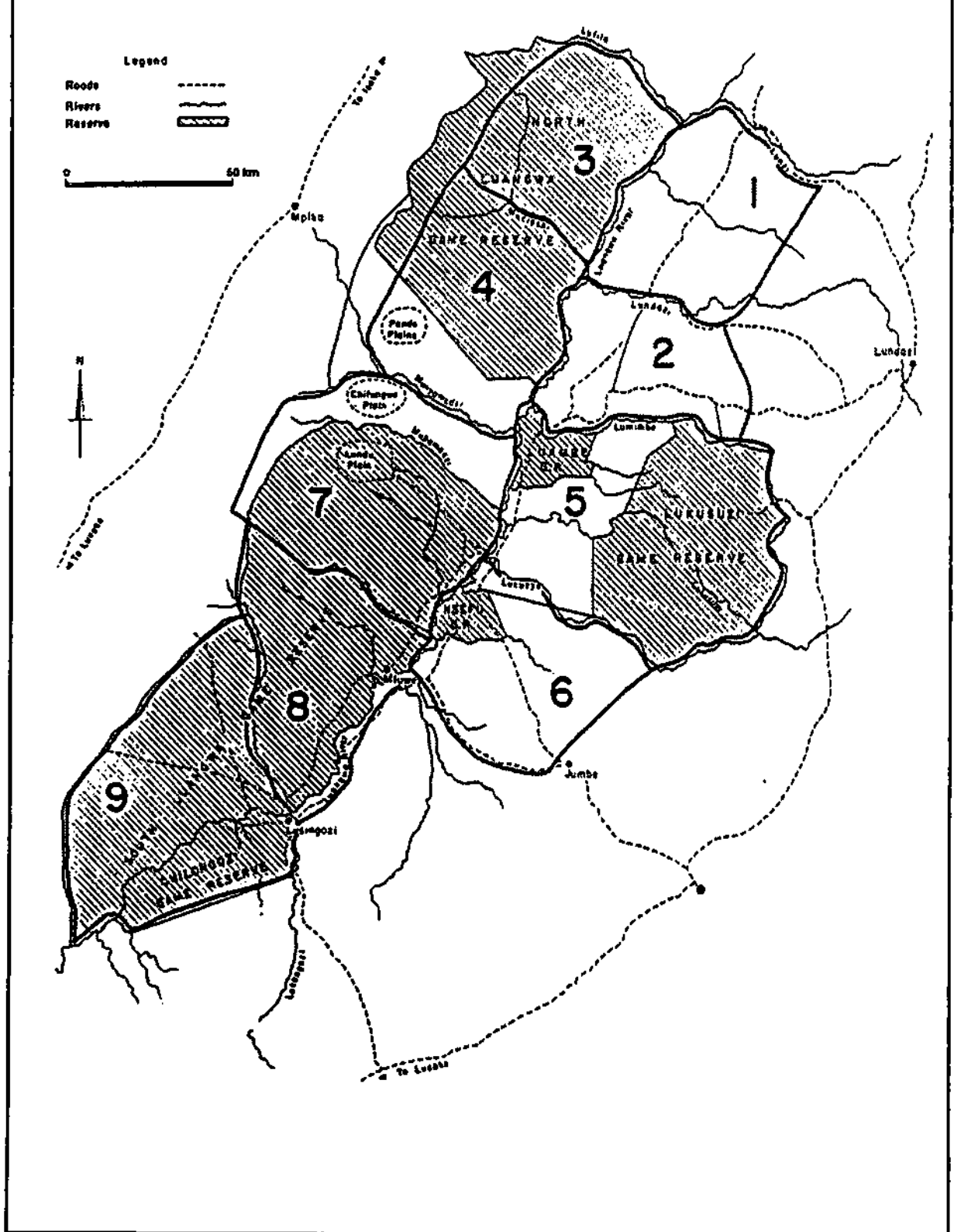
9a

Ranger W.E.Poles Counts and estimates 1951, based on ground counts in sample areas (Poles 1951)

Figures in brackets are the actual counts.

	Elephant	Buffalo	Hippo
South Reserve	929 (271)	6240 (2080)	549 (366)
North Reserve	689 (171)	6393 (2131)	394 (266)
Munyamadzi corridor	1812 (453)	2211 (286)	429 (286)

Aerial Census of November 1966
(From Dodds & Patton, 1967) (Note 9d)



9b

Warden J.M.C.Uys made the first aerial census of the Reserves in October 1964, he counted a 1.2km wide, 1897 km long transect along the Luangwa river and the major tributaries

	Elephant counted	Elephant estimated	Buffalo counted	Buffalo estimated
South Reserve	4247	15 000	9062	13 000
North Reserve	200	2000	620	2500
Munyamadzi	613	1500	1754	3500

Corridor

(Uys 1964)

(Later studies showed that the elephant populations are distributed away from the rivers at this time of the year).

9c.

Biologist P.B.Dean and Technical Assistant R.J.Dowsett made two aerial censuses of the South Reserve in 1965; in July they flew from the Luangwa river to the Muchingas along parallel flight lines at intervals of 5km. The total transects recorded were 1222 km with a width of 1.2km representing 17.2% of the area of the Reserve (Dean 1965)

	Elephant counted	Elephant estimated	Buffalo counted	Buffalo estimated
South Reserve	1594	9280	3412	19 840

In September the above transects were re flown but the sampled area was increased by flying 1010 km of transects at right angles to those flown in July The sample area was now 29.3% of the Reserve (Dean 1965)

	Elephant counted	Elephant estimated	Buffalo counted	Buffalo estimated
South Reserve	4614	15 740	8175	27 400

9d

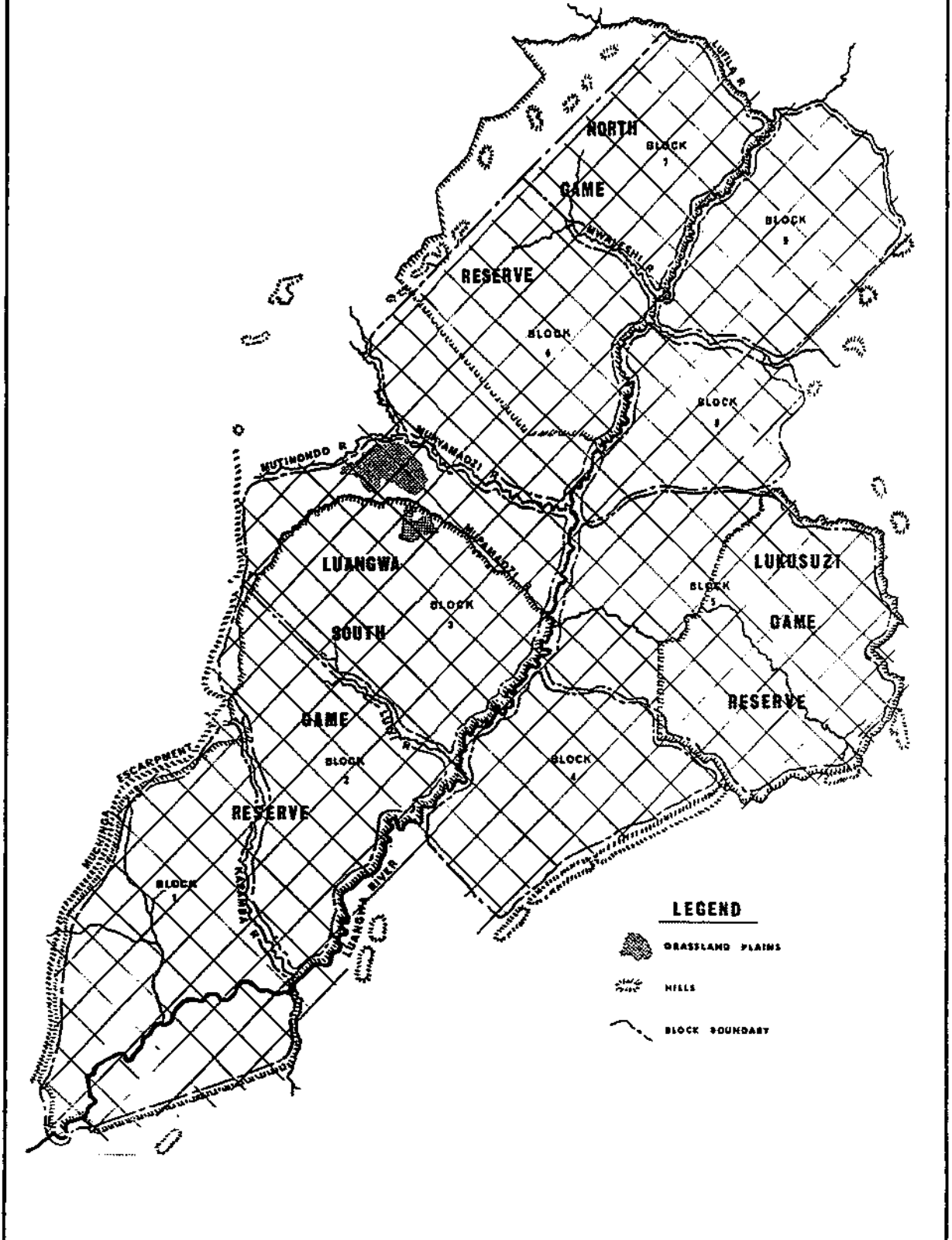
Biologist P.B.Dean and Technical Assistant R.J.Dowsett extended their survey of the valley in November 1966, over the area shown in map 21. Nineteen transects were flown parallel to the Luangwa and thirty eight at right angles to it, map 22. Estimates were not made of the buffalo population because of large variation in numbers counted along the transects.

Area on Map 21	Square kilometres	Elephant estimated	Buffalo counted on transects	Buffalo density per km ²
1	2522	1300	615	0.23
2	2149	1200	667	0.30
3	1875	1800	1792	0.96
4	3102	2500	1447	0.46
5	3035	4700	723	0.19
6	1973	1100	342	0.19
7	3418	4800	3296	0.96
8	2665	2800	5215	2.2
9	3423	3400	1099	0.30

(Dean 1968)

This census was repeated by D.R.Patton of the EPTA team (Patton 1967).

Aerial Census of November 1966
(Flight Transects) (Note 9d)



9e.

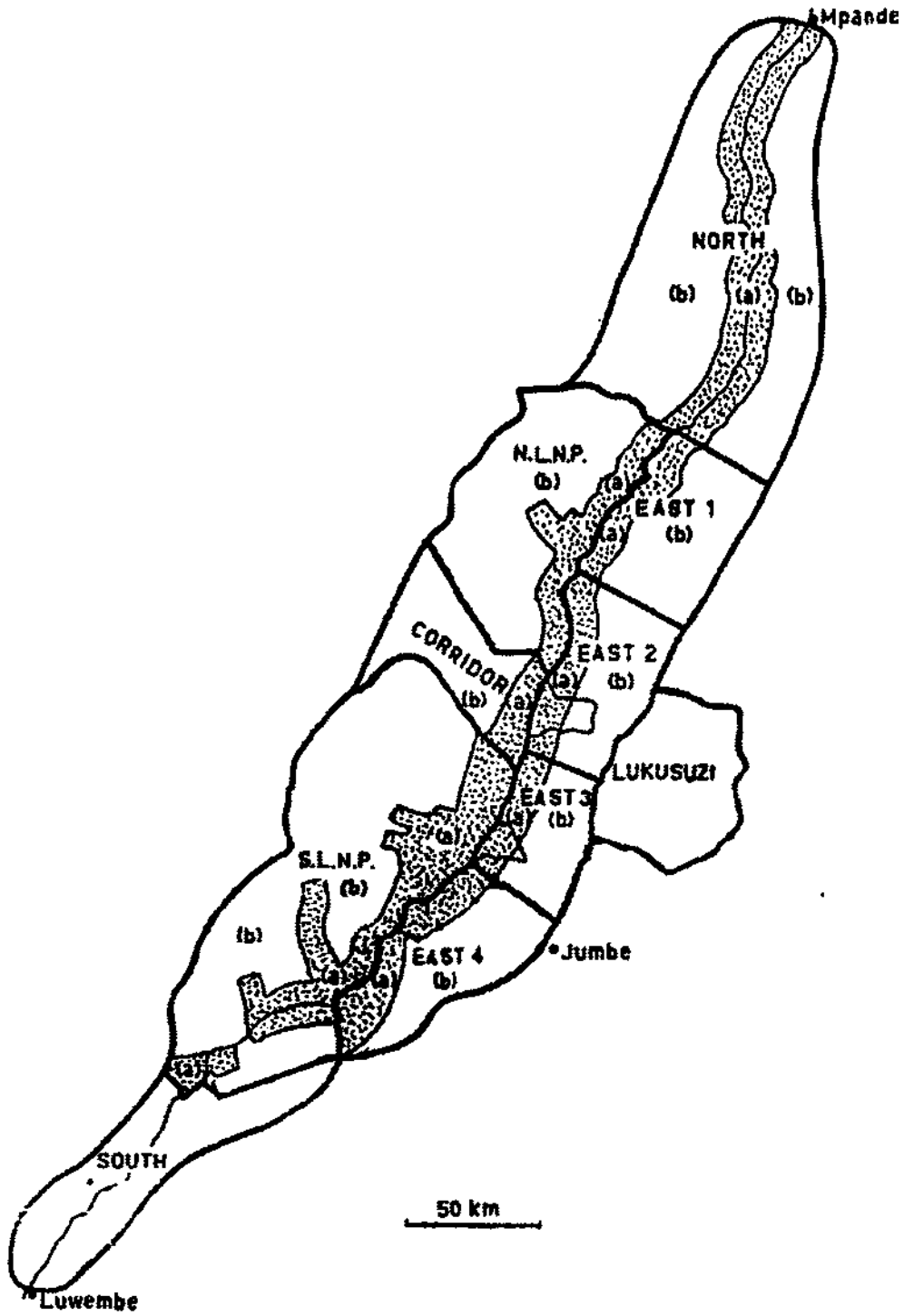
Aerial surveys designed to show the distribution of elephant were made in October 1970, January March and May 1971 and in August 1971 by staff of the Luangwa Conservation and Development Project. The results for the Reserve are shown in map 24.

9f

Staff of the Luangwa Conservation and Development Project surveyed the Valley in January 1973 during which the observers counted within a narrow strip width. Adjusting the original data of previous surveys the Research Biologist, J.G. Caughley concluded that the differences in elephant numbers in SLNP recorded from 1965 to 1973 were due to variations in strip width because the reported rate of increase of the populations was impossible.

Date	No. of elephant in SLNP	Transect width of observation	Reference
September 1965	14 000	600	Dean (1968)
June 1966	12 000	600	Dean (1968)
November 1966	10 000	600	Dean (1968)
June 1967	11 000	400	Patton (1967)
November 1969	18 000	400	Martin (1969)
August 1971	28 000	250	Van Lavieren (1971)
January 1973	31 600	100	Caughley (1973)

Blocks and strata established for the January 1973 Survey
High density strata stippled (Note 9g)
(From Caughley, 1971)



9g
The January 1973 Elephant Survey, map 23

Map location	Area/km ²	% of area sampled	Elephant numbers	Standard error of numbers
North/a	2560	2	4000	1210
North/b	7110	1	7100	2510
NLNP/a	1120	6	8800	1170
NLNP/b	3340	2	8900	3310
Corridor/a	480	8	1900	480
Corridor/b	1920	2	4800	1350
SLNP/a	2560	10	18 100	1350
SLNP/b	6860	3	13 500	2290
Lukusuzi	2630	2	4100	1390
East1/a	450	5	1000	470
East1/b	1550	1	800	490
East2/a	600	8	700	190
East2/b	1650	2	1200	650
East3/a	490	8	3800	110
East3/b	1660	1	4600	1660
east4/a	700	5	600	380
East4/b	1470	2	100	90
South of Reserve	2500	1	2200	1780

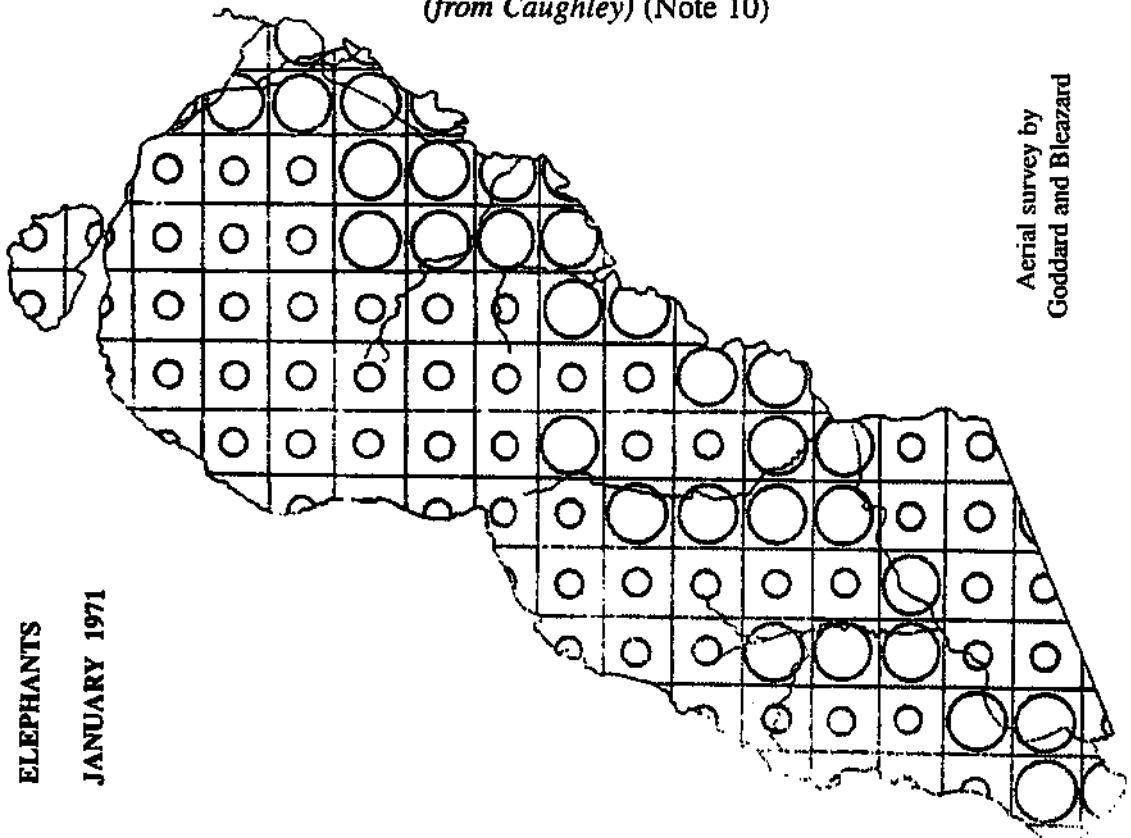
Summarising the above for the SLNP gives an elephant population estimate of 31600 with a standard error of 2650.

9h

Hippo counts in stretches of the Luangwa river were started in 1952 by Attwell and continued by W.F.H Ansell 1963-1964. Both observers counted from a boat.

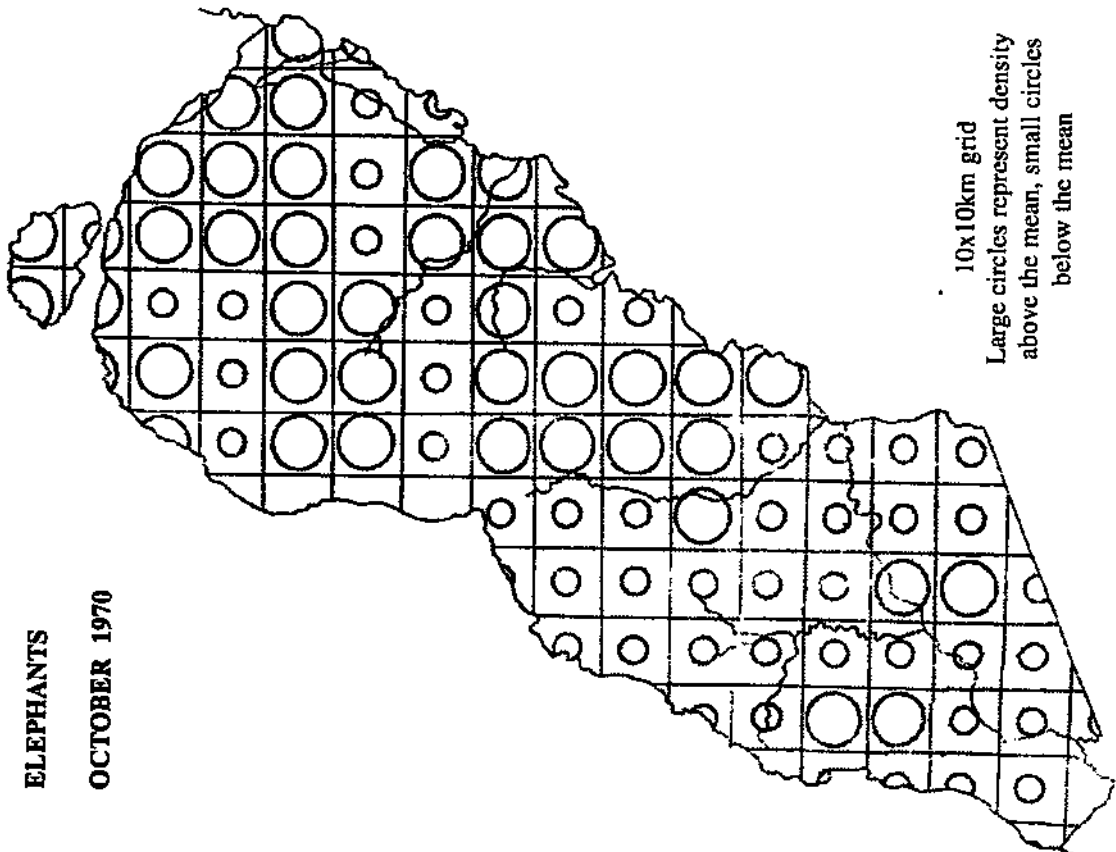
	Nsefu number	Nsefu number /km of river	Chilongozi number	Chilongozi number /km of river
1952	-		337	7
1953	312			
1954	289	8.1		
1955	358	10.0	440	5.6
1956	380	10.6	415	5.6
1957	490	11.2		
1958	438	11.8		
1959	461	12.5		
1960			821	10.6
1961				
1962				
1963			893	11.8
1964	600	16.8	933	12.5
1965				
1966	653	20.6		

Elephant Distribution
(from Caughley) (Note 10)



ELEPHANTS
JANUARY 1971

Aerial survey by
Goddard and Bleazard



ELEPHANTS
OCTOBER 1970

10x10km grid
Large circles represent density
above the mean, small circles
below the mean

Counts were made from Mfuwe pontoon downstream to the Mtipwazi confluence in 1963, 1964, 1966.

Year	Number	Number/km of river
1963	2082	14.3
1964	2317	16.2
1966	2421	8.77

R.J.Dowsett counted hippo from the north of the North Reserve to the south of the South Reserve in 1966 (Dowsett 1966). P.S.M.Berry conducted a census, from the ground, in August 1968 from Nsefu to Luangazi (Berry personal communication). During the F.A.O. Project hippo were counted both from the ground and from the air. The following estimates were made in June 1972, figures are the mean of two counts made on the same day.

Luangwa river stretch	Mean of two counts	Mean number/km river
Luafila-Mwaleshi	1151	15.1
Mwaleshi-Munyamadzi	2131	26.3
Munyamadzi-Chibembe	2149	41.6
Chibembe-Nsefu Camp	1449	31.25
Nsefu Camp-Mfuwe pontoon	1099	23.3
Mfuwe pontoon-Panse	792	27.5
Panse-Kapamba	415	13.1
Kapamba-Lusiwasi	887	21.7
Mutinsase-Msanzara	794	14.1
TRIBUTARIES		
Munyamadzi	1052	
Mupamadzi	331	
Kapamba	1	
Mutinsase	41	

Hippo in the ox-bow lakes were not counted. The total counted in the Luangwa was 10 867, this compares with a total of 7554 made by R.J.Dowsett in 1966.

10 Large Mammals and crocodiles: in the Park distribution and density as recorded by the Luangwa Conservation and Development Project 1973 (Caughley 1973.)

The abundance and distributions of large mammals were recorded in 1971-72. The results in summary were:

Elephant There were about 30 000 elephants; in January the population(s) concentrated along the Luangwa and its major tributaries. The concentration averaged about 7km² in the alluvial areas and 2km² elsewhere. By May the elephants were evenly distributed throughout the Park. There were two main concentrations, one in the north east and one on the east bank south of the Kapamba. Maps 24a, 24b, 24c.

Hippopotamus In June 1972 the estimates for hippo were about 6000 in the main river and a further 400 in the tributaries, the grazing distance from the river was thought to be about 1.5km and the gazing density about 8km². There is an exodus from the river when it is in full flood and an amalgamation of groups in the Dry Season.

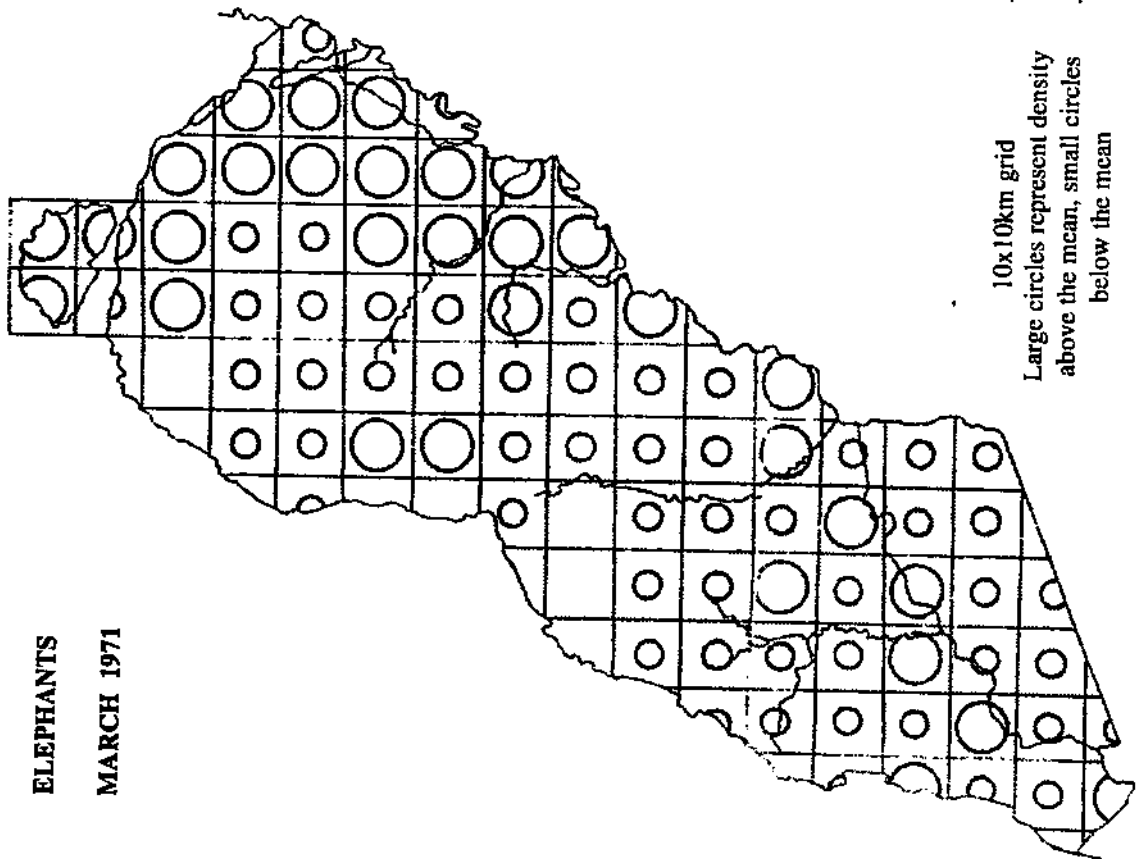
Buffalo Buffalo were found in large herds and so the overall density was more difficult to estimate. The estimate was between 1 and 3km² giving a total for the south Reserve of 7000-21 000, there were above average densities along the Luangwa and the Mupamadzi. Map 26

MAP 24b

Elephant Distribution
(from Caughley) (Note 10)

Aerial survey by
Goddard and Bleazard

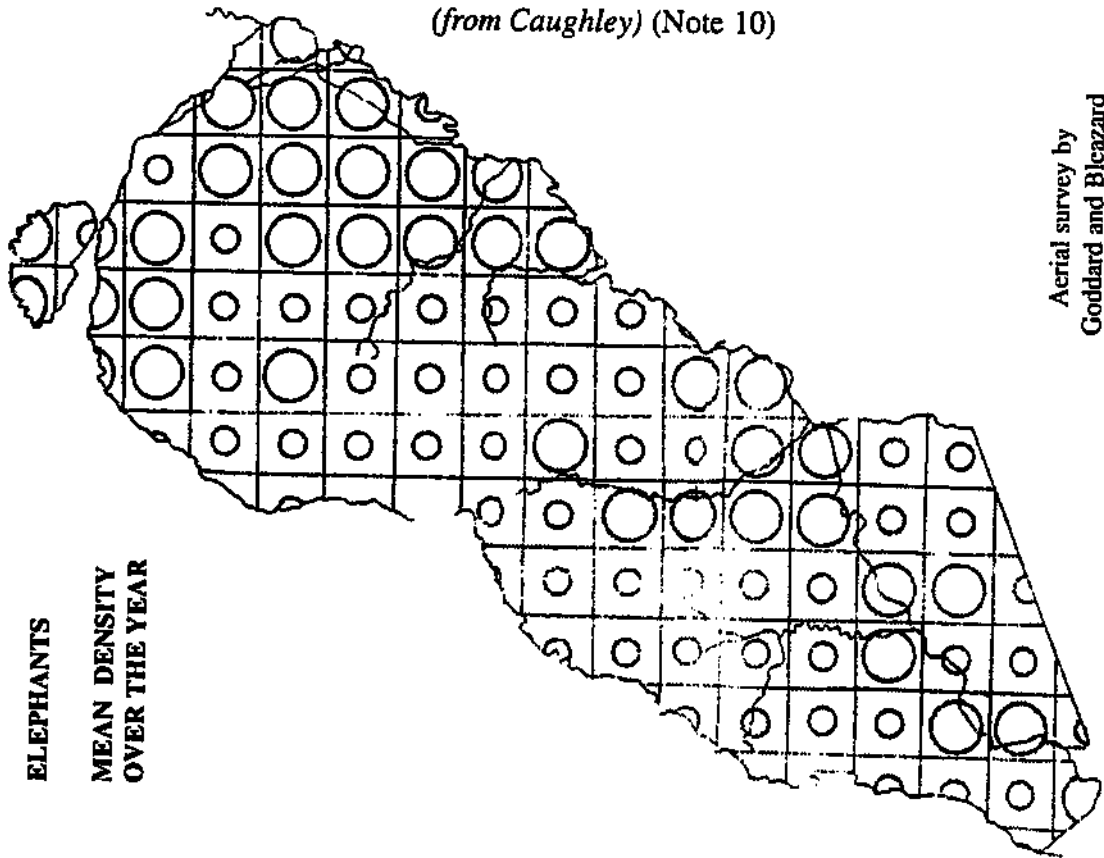
ELEPHANTS
MAY 1971



ELEPHANTS
MARCH 1971

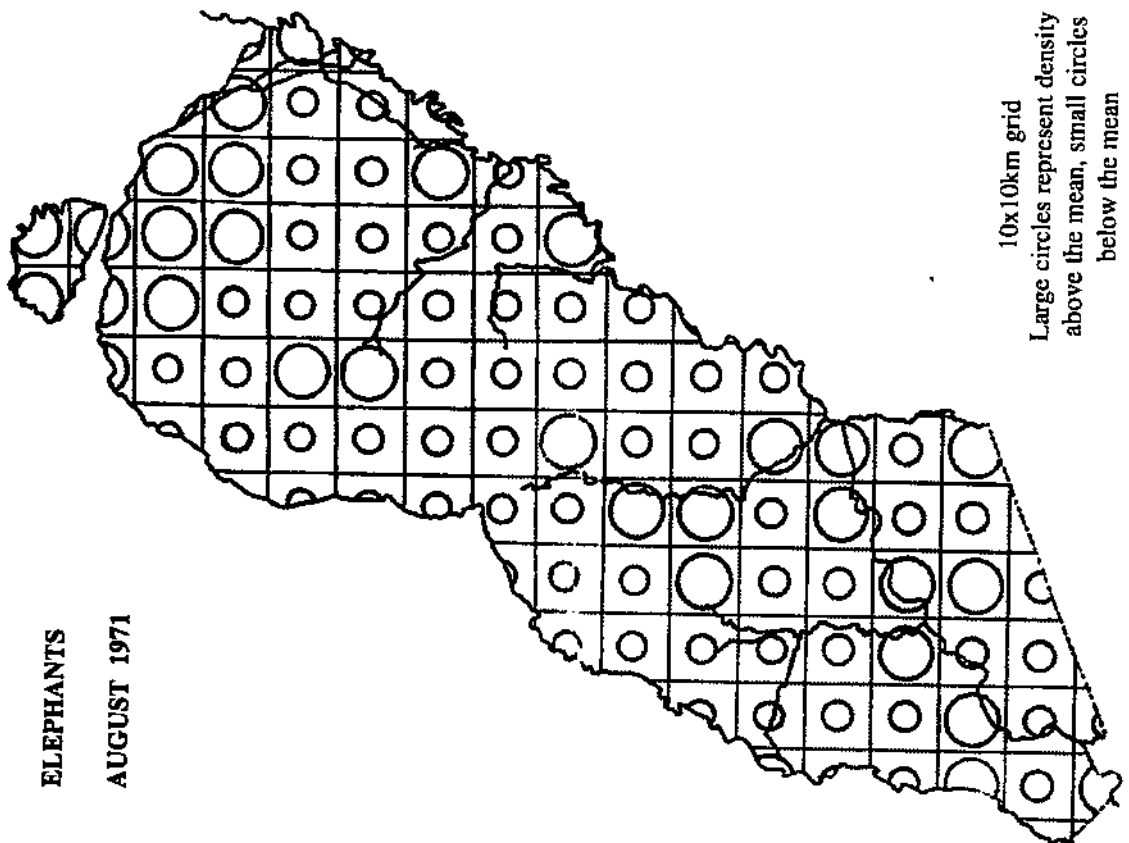
MAP 24c

Elephant Distribution
(from Caughley) (Note 10)



Aerial survey by
Goddard and Bleazard

ELEPHANTS
MEAN DENSITY
OVER THE YEAR

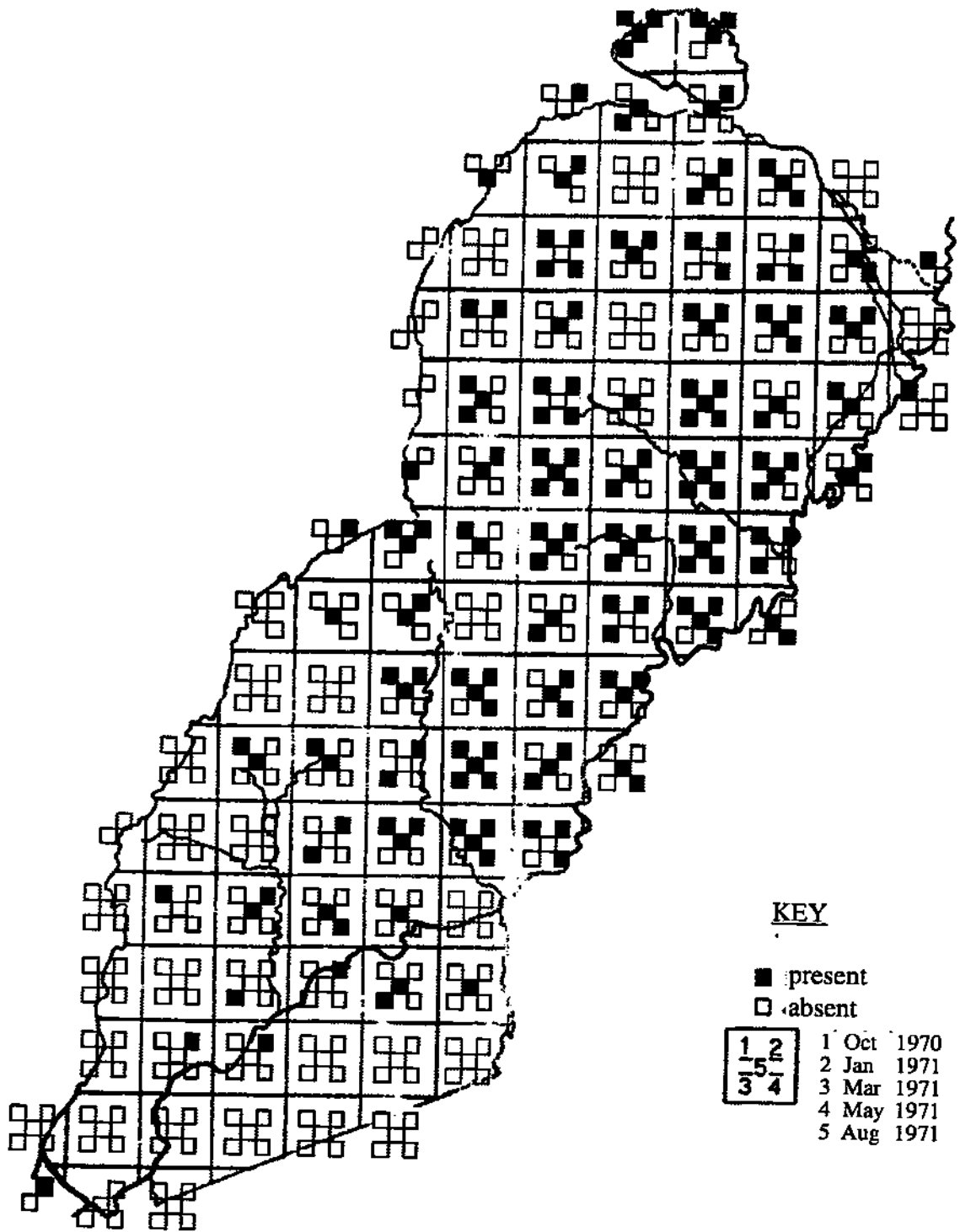


10x10km grid
Large circles represent density
above the mean, small circles
below the mean

ELEPHANTS
AUGUST 1971

RHINO DISTRIBUTION 1970 - 1971

(from Caughley 1973) (Note 10)



10x10km grid
 Presence or absence of rhino recording during elephant distribution aerial surveys.
 Goddard, van Lavieren, Bleazard

Rhinoceros The density of rhinoceros was thought to be about 0.4/km², giving a Park population of 2800. They were found in all vegetation types. Map 25

Zebra Zebra were found throughout the Park concentrated in open areas along the Luangwa, with densities up to 8/km².

Impala Impala occurred mostly in the alluvial areas where their density was estimated to be 35/km².

Puku Puku were also restricted to the riverine areas with density of about 25/km² and with no seasonal movement.

Eland Eland were locally common and confined to the alluvial zone of the Luangwa.

Roan Roan were occasional in Miombo woodland but sometimes seen in the alluvial areas.

Sable Sable were rarely seen and then only at the foot of the Escarpment.

Greater Kudu Kudu were common and moved seasonally to the Miombo area returning to the Luangwa at the beginning of the Rains.

Bushbuck Bushbuck were common in alluvial thicket areas, no seasonal movement

Water Buck Waterbuck were abundant but restricted to the alluvial area.

Giraffe Giraffe occurred mainly outside the Park along the Luangwa on the east bank from Luambe to south of the South Reserve but were concentrated near to Chilongozi.

Wildebeest Wildebeest were recorded in the park in numbers only in the Nsefu sector. They did occur to the north of the North Reserver and occasionally elsewhere in the South Reserve

Lichtensteins Hartebeest Hartebeest were fairly common in Miombo woodlands but were rare in alluvial areas.

Oribi Oribi occurred very locally. They were often seen on Chifungwe Plain and possibly, although this is doubtful, on the north bank of the mid-Lubi river.

Reedbuck Reedbuck were uncommon but were sometimes seen in grassy areas in Miombo woodland.

Sharpes Grysbok, Common Duiker Both these species were widespread in Miombo woodland.

Lion Lion occurred throughout the Park. There were more in the alluvial area of the Luangwa where their densities were estimated to be 0.2/km²

Leopard Leopard were very common but no estimate was made of their number.

Wild Dog Wild Dog occurred throughout but were nowhere common

Spotted Hyaena This species was very common throughout

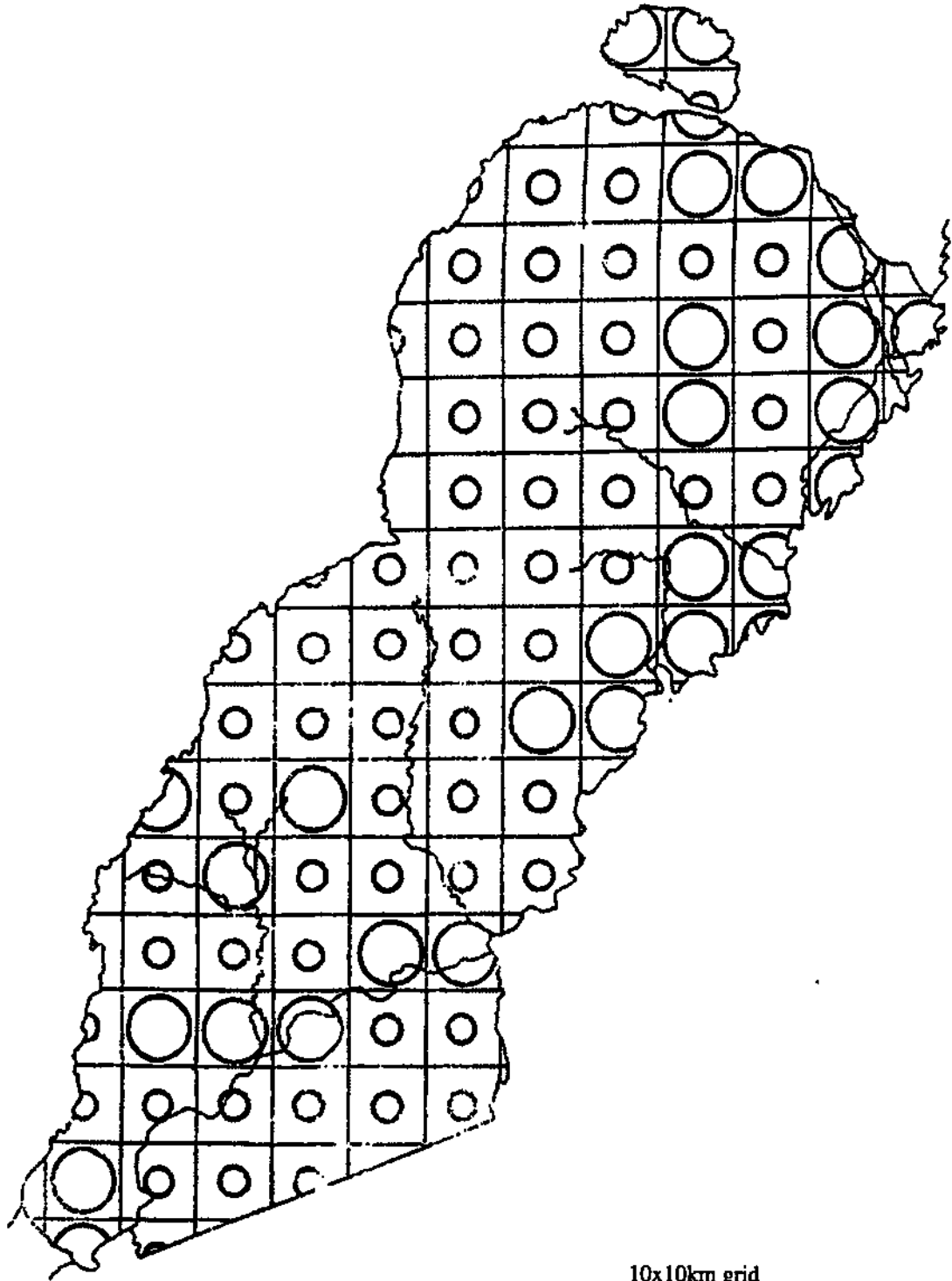
Crocodile. The density of crocodiles was found to be 13/km of river between Mfuwe lagoon and Lusangazi. The estimated number in the Luangwa from the north of the North reserve to the south of the South reserve was 6300.

11 The boundaries of the South Reserve were described as follows:

GN 51 of 1938 The Luangwa Valley Reserve Southern Section 27th. May 1938

Starting from the junction of the Mpupushi river with the Luangwa river the boundary follows the Mpupushi river to its junction with the Mfushi stream, thence up the Mfushi stream to its source in the Muchinga Escarpment thence along the ridge of the Escarpment in a generally north by north east direction to the point where where the Provincial boundary between the Central and Northern Provinces intersects the Escarpment thence along this boundary in a south easterly direction to the source of the Lubanda stream thence down the Lubanda to its junction with the Kapamba river thence down the Kapamba river to its junction with the Lokwa stream thence up the Lokwa to the point where it enters the Muchinga Escarpment thence along the ridge of this escarpment in a northerly direction to the point where it is intersected by the Mupamadzi river thence down the Mupamadzi to its junction with the Luangwa thence down the Luangwa to its junction with the Lusangazi thence up the Lusangazi to the point where it intersects the North Charterland Concession

BUFFALO MEAN DENSITY 1970 - 1971
(from Caughley 1973) (Note 10)



10x10km grid
Mean buffalo distribution over the year.
Large circles represent above average density,
small circles below average density

boundary thence along this boundary in south westerly direction to the point where it intersects the Mtiwazi river thence down thw Mtiwazi river to its junction with the Luangwa river thence down the Luangwa to its point of starting 3450sq mile (8935km²)

GN 335 of 1942 under the Game Ordinance of 1941 17th December 1942 The Luangwa Valley Game Reserve Southern Section comes into effect on 1st Jan 1943.

The 1938 description was modified as follows:

–along the edge of the Escarpment in a generally north by north East direction to the source of the Nyanga thence down the Nyanga river to its junction with the Kapamba thence up the Kapamba to its junction with the Kangala stream thence up the Kangala stream to its source thence in a northerly direction to Kapiri Kasweta hill thence in a similar direction to the junction of the Finkono stream with the Mupamadzi thence down the course followed by the Mupamadzi to its junction with the Luangwa thence down the Luangwa–Area 3200sq.miles. (8288km²)

GN 256 of 1952 substituted 'down the course followed by the Mupamadzi in 1942' for 'down the Mupamadzi'

GN 175 Of 1957 16th July 1957 and GN 224 of 1957 24th August 1957 Game Reserve No.1 Luangwa Valley:Southern section. the boundaries are the same as those in 1942

SI No.44 of 1972 National Park Number 1, South Luangwa National Park

Starting at the confluence of the Luangwa and Mpupushi rivers the boundary follows the right bank of the latter river upstream to its confluence with the Mfuke (Mfushi) stream, thence up the right bank of this stream to its source in the Muchinga escarpment, thence along the brink of the said escarpment in a general north by north easterly direction to the source of the Luanda river; thence down the left bank of this river to its confluence with the Kapamba river, thence up the right bank of the Kapamba river to its confluence with the Kangala, thence up the right bank of the Kangala river to its source, thence in a northerly direction to Kapili Kasweta, thence northwards to the confluence of the Finkono stream with the Mupamadzi river, thence down the left bank of the Mupamadzi river to a beacon erected there on, thence in a northerly, easterly, and southerly direction following a line of beacons erected around the margins of the Chifungwe Plain to a beacon erected on the left bank of the Mupamadzi thence along a line of beacons to the Luangwa river thence following the thalweg of the Luangwa river downstream to its confluence with the Mwasauke stream thence up this stream for a distance of approximately 4.8km thence following in a straight line in a generally south easterly direction on a bearing of 146° to a beacon on the Kauluzi stream thence down the left bank of this stream to its confluence with the Luangwa river thence following the thalweg of the Luangwa river to its confluence with the Lusangazi river thence up the right bank of this river for a distance of approximately 30.6km, thence in a straight line on a bearing of 251° to a beacon on the Mtipwazi stream thence down the left bank of this stream to its confluence with the Luangwa river thence following the thalweg of the Luangwa river downstream to its confluence with the Mpupushi river.

The above area of 9050km² is situated in the Central, Eastern and Northern Provinces and is shown bordered in red on Plan No NP 1 deposited in the office of the Surveyor General and dated 1st Feb. 1971

This definition differs from the 1938 description as modified in 1943 and subsequently as follows: the **right bank of the Mpupushi** is substituted for **the river**, the **right bank of the Mfuke (Mfushi) stream** is substituted for **Mfushi stream**, the **brink of the Escarpment** is substituted for **the ridge of the Escarpment**, the **source of the Luanda stream** for the **source of the Nyanga stream**, includes the Chifungwe Plain and a line of beacons for the course of the Mupamadzi river, includes the Nsefu sector

a. The line of beacons which define the boundary around the Chifungwe Plain and eastwards to the Luangwa river had not been constructed by 1995.

b. The defined area of 9050km² is approximately 300km² more than the area I measured by inspection of the 1:50 000 maps.

12 Valley Game Management Areas (GMAs)

The GMAs established under the National Parks and Wildlife Act (1968) and declared under SI No.174 of 1971

West Petauke, Sandwe, Lupande, Lumimba and Musalangu, frontspiece map

Game Management Areas and equivalents under previous legislation

Game Management Area	Controlled Hunting Area	Controlled Area	Population in 1969 (density/km ²)
No.18 Chisomo 3390km ²	No.2 Chisomo First Class 390km ²	Part of Petauke 10 531km ²	2268 (67)
No.19.Sandwe 1530km ²	No.15.Sandwe First Class 1427km ²	Part of Petauke	2429 (1.6)
No.20 Lupande 4840km ²	No.20 Kunda Second Class 4480km ²	Kunda Tribal Area 4480km ²	16 796 (3.3)
No.21 Lumimba 4500km ²	No.16 Lundazi-Chewa First Class 4210km ²	Lundazi-Chewa Tribal Area 4210km ²	11 802 (2.6)
No.22 Musalangu 17 350km ²	No.22 Senga Second Class 16 214km ²	Senga Tribal Area 16 214km ²	30 887 (1.8)
No.24 Munyamadzi 3300km ²	No.12 Munyamadzi First Class-3363km ²	Munyamadzi 3363km ²	7616 (2.3)

(a) GMAs were established under the National Parks and Wildlife (Act 1968) Statutory Instrument 174 of 1971

CHAs were established under the Fauna Conservation Ordinance GN 176 of 1957

CAs were established in 1945 under the Game Ordinance of 1942

(b) Part of Petauke CA was decontrolled in 1957

13 Game Animals allowed on a District Game Licence, 1972

Species	Eastern Province (West Petauke, Lupande Lumimba, Sandwe GMAs)	Chisomo GMA	Munyamadzi GMA
Buffalo	1	1	1
Bush-pig	3	3	3
Bushbuck	1	1	1
Duiker	1	1	1
Hartebeest	-	1	1
Impala	2	1	1
Oribi		-	1
Puku	1	-	-
Warthog	1	1	1
Waterbuck	-	1	1

(a) The District game licence cost K0.75, animals other than those legally defined as either game animals or protected animals could also be hunted. A bird licence cost K2-00, which permitted all species of game birds. Both licences were valid only in the District of issue.

(b) Applicants for either licence first had to obtain a firearm licence of the correct calibre-which was designated by law.

(c) An applicant also required a, free, GMA residents permit, these were issued by the Local Council on a quota annually determined by the Department.

14 Registered firearms within the Valley GMA's in 1971

GMA	Muzzle loader	Shotgun	Rifle	Total	Permits issued 1971 /allocated	Permits allocated 1972
Chisomo	26	6	4	36	18/60	90
West Petauke	15	-	-	15	6/40	100
Sandwe	26	-	4	27	22/40	100
Lupande	291	69	22	382	77/100	150
Lumimba	71	29	4	104	?/150	150
Munyamadzi	149	8	3	160	50/200	100
Musulangu	245	71	17	333	97/150	200
Total	823	183	51	1057	270+/740	890

(Stier 1973a quoting rural council records).

(a) Permits were allocated by the Department for a designated GMA but issued by the rural council on the basis of a Chief's area. The effect of this was that a chief could be allocated more than the requested numbers of permits or other chiefs allocated less.

(b) Applicants for a bird licence also required a GMA permit, this type of hunter was therefore in direct competition for a GMA permit with an applicant for a game licence, the total game meat harvest would therefore be reduced..

(c) It is believed that not all firearms were registered, in 1967 there were 356 registered firearms in Munyamadzi GMA whereas in 1971 there were only 160.

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This was published locally, it contained descriptive articles and notices of the Administration.

The following issues contain relevant notices-some references are duplicated under the authors name

September 15 1895 - about E.J.Glave (one of Stanley's assistants who died on the Congo river 15/9/1895).

June 1st 1896 - records Wiese and de Salla living at M'peseni's kraal.

July 1st 1896 - has a description of the lower Loangwa river.

August 15th 1896 - about local currency.

September 15th 1896 - publishes regulations for the preservation of Game.

January 1st 1897-description of the country between Lakes Nyasa and Banguelu by E.J.Glave.

February 1st 1897 - quotes from Mouvement géographique for November 1896 which lists the number of trans-Africa journeys as 19, the quickest of 355 days, the article attempts to show how to cross in 120 days.

April 1st 1897 - says the proper term for 'safari' or 'trek' is 'ulendo' also describes cricket at Mweru.

May 1st 1897 - Amended Regulations for Game preservation (-in what is now Malawi).

May 15th 1897 - a description of hunting fields near Luangwa.

August 1st.1897 - Hugo Genth's visit to M'peseni.

January 5th 1898 - account of Mpeseni.

November 8th1897-hunting in the Luangwa valley.

February 5th 1898 - Hugo Genthe describes the Luangwa Valley.

February 26th - staff list.

March 19th 1898-death of Hugo Genthe.

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There are many reports, 1984-1994, including those on the following subjects.

1. Administrative Documents.
2. Community education documents.
3. Unit Data Review Documents.
4. Staff Training Documents
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6. Safari Hunting Documents.
7. Other Documents.

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Albl P submitted four reports to FAO in 1968 which are summarised in the Department's Annual report for 1968, it is probable these reports were published in the scientific press

(1) Determination of the condition of the African elephant of the Luangwa Valley with a supplement Judgement of the condition of the elephant alive in the field.

(2) A study of the significance of a liver-hookworm (*Grammocephalus clathratus*) in the African elephant.

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SECTION FOUR Maps

Maps published in books or journals included in this bibliography are not included here neither are current maps. Early general maps are listed and annotated in *Maps of Africa*, by O.I. Norwich, published Donker, Johannesburg 1983. District maps were made and kept by the District Commissioners of each District during the Colonial period but only the one for Lundazi has been located. The present whereabouts of others is unknown; fragments of Serenje District map of 1944, Fort Jameson 1913, and Mpika 1938, have been seen and are listed below.

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FO 881/7322.

Copy of Concessions granted to Mr Carl Wiese

FO.83/1240

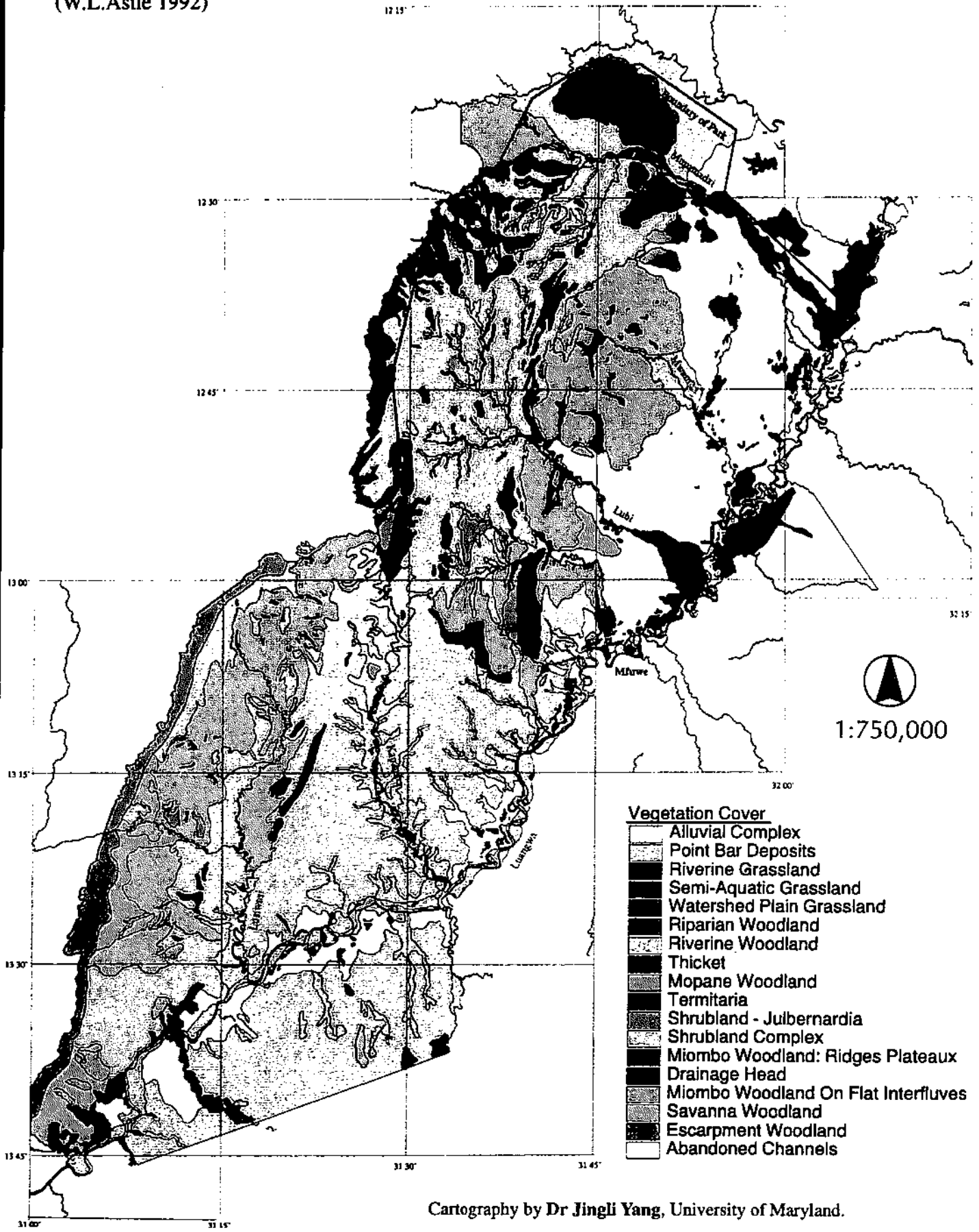
Precis of information concerning B.C.A., compiled by Major C.B. Vijvyan

Cheshire, June 1999.

South Luangwa National Park - Vegetation Map

(W.L.Astle 1992)

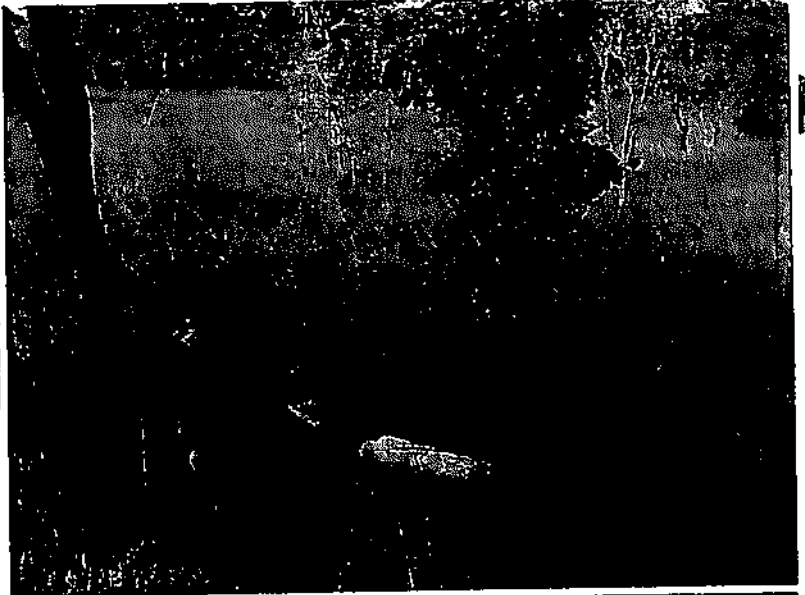
12 15'



Vegetation Cover

- Alluvial Complex
- Point Bar Deposits
- Riverine Grassland
- Semi-Aquatic Grassland
- Watershed Plain Grassland
- Riparian Woodland
- Riverine Woodland
- Thicket
- Mopane Woodland
- Termitaria
- Shrubland - Julbernardia
- Shrubland Complex
- Miombo Woodland: Ridges Plateaux
- Drainage Head
- Miombo Woodland On Flat Interflaves
- Savanna Woodland
- Escarpment Woodland
- Abandoned Channels

Cartography by Dr Jingli Yang, University of Maryland.



any ill-treatment of the King's native subjects
 (Signed) Joseph Thompson
 for the
 British South Africa Company
 Kimberley signed X his mark

(Signed) *[Handwritten signature]*
 5-11-1905
 (William [unclear])
 (Signed) Charles Wilson
 (Signed) [unclear]

Signed E. W. White
 through official
 interpreter



This new book provides a vivid but scholarly account of historical events in the mid-Luangwa valley of Zambia. The text is based on over 700 references derived from a wide range of sources including government, local and private archives and active field experience from 1959-1990. The book charts the political developments in the country, the establishment and policies in the British South Africa Company (1889), the Protectorate (1924), National Independence in 1964 and the influence of British conservation societies.

It is a valuable resource document for undergraduate or postgraduate courses in the UK and should form a sound base for further detailed study of the points raised. This book would also make an excellent companion for any visitor to the valley.

