Feeding habits : Delicate browsing and grazing, and scavenging round human habitations.

Breeding : Young lambs have been recorded during March, April and June but there is probably no definite breeding season.

Latest estimation of numbers : Several hundred. May even be a thousand and more.

Raphicerus campestris zuluensis Roberts.

Steenbuck.

A common species in the Kruger Park and widely distributed over most of the flat country. More abundant in the savanna woodlands and tree savannas but is frequently encountered even in the densely wooded Nyandu bush. (Fig. xix). Steenbuck were exceedingly numerous before 1914. After 1920, for a good many years they were hardly seen at all, and only increased again in numbers during the 1930's. (Stevenson-Hamilton, 1939).

Feeding habits : Delicate browsing and a little grazing. Independent of surface water.

Breeding : Young lambs have been recorded from April-June and also in October and January.

Latest estimation of numbers : Several thousand.

Raphicerus sharpei colonicus Thomas and Schwann.

Sharpe's or Tropical Grysbok.

Fairly common and widespread in the mopani and mixed mopani-*Combretum* veld. Also inhabits the whole of the Lebombo range between the Olifants and Sabi Rivers but has not yet been recorded south of the latter river. (Fig. xx).

Feeding habits : Delicate low browsing and some grazing.

Breeding : A lamb of some two months old was encountered during September. Lambing season probably extends from July to October (Ansell, 1960).

Latest estimation of numbers : Several hundred of which some 150 inhabit the selected habitats in the central district.

Nesotragus moschatus zuluensis Thomas.

Livingstone's Suni.

A typical inhabitant of the southern tropical littoral, the distributional range of which is strictly confined in the Park, to the thickly wooded Nyandu bush on the eastern boundary north of the Shingwidzi River. (Fig. xxi).

Feeding habits : Delicate browsing and some grazing.

Breeding : No local records. Lambing season from November-December in Central Africa (Asdell, 1946).

Latest estimation of numbers: Doubtful. Spoor, droppings and other signs indicating their presence are commonly found in the Nyandu bush but in view of their nocturnal grazing habits these tiny and secretive animals are rarely seen. An adult female was observed during the late afternoon in August, 1962.

Ourebia ourebi Zimmerman.

Oribi.

This species became extinct locally in 1943 when the last individual was seen near Ship Mountain, north east of Pretoriuskop. A few of these timid little buck survived in the Pretoriuskop area until the late 1930's. A single specimen was seen by the Warden on the Lebombo flats near Mlondozi in September, 1925. According to Stevenson-Hamilton (1929) they were never common in the Low country and appeared here by force of circumstances rather than as willing visitors. This may well be true as it was found to our dismay that a group of 29 which were captured in the Badplaas district during July and August, 1962, and released in a special enclosure near Pretoriuskop, adapted themselves very poorly to their new habitat, and within three months more than half their number had died — in most instances for no apparent reason. (Fig. xxii).

Feeding habits: Delicate grazing and browsing in open anthill country.
Breeding: Lambs are dropped from September-November.
Latest estimaiton of numbers: 10.

Oreotragus oreotragus transvaalensis Roberts.

Klipspringer.

Widespread and relatively abundant in their chosen rocky habitats throughout the Park. (Fig. xxiii).

Feeding habits: Browsing and a little grazing in their specialised habitats.
Breeding: Lambs have been recorded in November and December.
Latest estimation of numbers: Several hundred.

Redunca arundinum arundinum Boddaert.

Reedbuck.

A species with specialised habitat requirements but widely distributed throughout the Park where environmental conditions are favourable. They are particularly common in the long grass veld of Pretoriuskop section, the grassland plains and dambo-like depressions of the northern Lebombo flats and the Mlondozi headwaters of the central district. (Fig. xxiv). The growth curve of the Pretoriuskop population indicates considerable irregular fluctuations over the years, often associated with periods of prolonged drought and series of wet years, but has shown a progressive inclining trend during the past decade. (Stevenson-Hamilton, 1939).

Feeding habits: Grazing and a little browsing. Very partial to burnt veld.

Breeding: Lambs have been recorded during March, July, November and December and there is probably no definite breeding season.

Latest estimation of numbers: 850-900 of which 350-400 south of the Sabi River and some 200 in the central district.

Redunca fulvorufula fulvorufula Afzelius.

Mountain Reedbuck.

At one time a rare species in the Park, being limited by strict environmental selection, but has exhibited steady progress during recent times in their chosen habitats. At present fair numbers inhabit the mountainous area west of Malelane, Ship Mountain, Stungwane and Sithlabe hills in Pretoriuskop section, as well as the Lebombo ridge between the 24°30' and 25°15' latitudes. (Fig. xxv).

Feeding habits: Grazing on mountain slopes and valleys.

Breeding: The lambing season probably extends from September to February.

Latest estimation of numbers: 180-200 of which some 50 occur north of the Sabi River.

Kobus ellipsiprymnus Ogilby.

Waterbuck.

A gregarious species steadily increasing in numbers and widely distributed in woodlands near permanent water throughout the Park. Very partial to rupicolous surroundings. The population south of the Sabi River had been more or less stagnant for years, but satisfactory reports have been received of late of flourishing herds, particularly in the Crocodile Bridge section. Centres of heaviest population density are the lower reaches of the Orami Spruit, the Mlondozi area of Tshokwane section, Nwaswitsontso River, Nwanetzi catchment area, Timbavati river, the broken country along the Olifants River as well as the whole length of the Shisha-, Mphongolo-, Pukwane- and Shingwidzi Rivers in the northern district. (Fig. xxvi).

Feeding habits: Grazing and a little browsing. Certain species of coarse grasses are relished.

Breeding: With the exception of the winter months calves are born throughout the year, with peaks during October and from February to March.

Latest estimation of numbers: 3,000-3,500. Of these some 400 occur south of the Sabi River and 1,500-1,600 in the central district.

Aepyceros melampus melampus Lichtenstein.

Impala.

The most abundant ungulate species in the Park which may at present be encountered in herds of varying size anywhere in the southern and central districts during the summer months. It is however, only recently that

the Pretoriuskop long grass veld and the mixed mopani-*Combretum* veld north of the Timbavati River have been colonised by these antelope. During the dry season they do not venture far from permanent water and although they do not exhibit very specialised habitat preferences, they are very partial to riparian forests and thornbush thickets near water. In the northern district there are still large tracts of country where impala are never found, mainly because of a lack of permanent water or other deficiency of the habitat. They seem to avoid particularly the more open portions of the Tsende and Babalala flats. (Fig. xxvii).

Feeding habits : Browsing and grazing.

Breeding season : A sharply defined lambing season from the first week of November to the end of December. Early lambs are sometimes born in October and others arrive in January and February and even as late as April during particularly dry summer seasons.

Latest estimation of numbers : 180,000 (possibly more) with 60,000 in the southern district, 85,000 in the central and 35,000 in the northern district respectively.

Hippotragus equinus equinus Desmarest.

Roan Antelope.

The only large ungulate species of which the population growth curve has remained relatively stagnant through the years, and which has not yet reacted favourably to the stringent protection afforded them. The factors responsible for the present unsatisfactory status of these animals are complex, but largely centred in the fact that the habitat range which really suits their ecological requirements is strictly limited in the Park, and has deteriorated considerably through the years. The roan antelope is a plains-loving ungulate, frequenting also the woodland-fringes of such open grassland plains and dambos which they choose as their home ranges. They are highly selective feeders and can not compete in the same area with species with less fastidious or more adaptable grazing habits. It is also particularly susceptible to epizootic diseases such as anthrax. (Pienaar, 1960 and '61).

The survival of the species in the Kruger Park is at present a matter of some concern and pending the results of an intensive investigation of their bio-ecology, which is well under way, certain provisional measures have been applied in an attempt to annul some of the limiting factors stifling their progress.

The bulk of the roan population in the Kruger Park today inhabit the grassland plains and more open parts of the mopani and mixed mopani-*Combretum* woodland and tree savannas north of the Olifants River.

Three isolated herds have also survived in the Batavia and Munweni areas of the central district and around the headwaters of the Mbyamiti and Mtsawu Rivers in the southern district. (Vide Fig. xxviii).

Feeding habits : Selective grazing and some browsing.

Breeding : Reproduction data accumulated to date are inconclusive but seem to indicate that calving takes place during the dry season (May-October).

Most recent estimation of numbers : 200-220 in the northern district, 31 in the central district and 35 south of the Sabi River. Total 266-286.

Hippotragus niger niger Harris.

Sable Antelope.

The sable is one of the antelope species most susceptible to drought conditions and suffer severely during prolonged dry periods. Before the great drought of 1926-'35 sable antelope were of common occurrence in the area west of the Skukuza-Malelane main road and substantial herds frequented the Lwakahle and Randspruit sections. By the end of 1935 they had disappeared completely from this area which was so severely trampled out that there was hardly a blade of grass left (Stevenson-Hamilton, 1939). It is only very recently that there have been conclusive signs that these noble beasts are again attempting to recolonise this old favourite haunt of theirs. Elsewhere in the Park the sable antelope population also suffered heavy losses during the droughts of 1926-'35, 1944-'48 and 1950-'54, giving rise to a decidedly undulating population growth curve. Following a series of favourable years and sound conservation policies however, the sable population in sharp contrast to the roan antelope, is at present experiencing an unprecedented golden age — a state which is reflected by the large numbers of calves which reach maturity in all breeding herds.

The mixed *Combretum* veld and long grass veld of the western half of the Park carry the largest number of sable but the more open woodlands and tree savannas of the eastern zone are also inhabited by large growing herds. Even the relatively dense perimeter of the Nyandu bush has its own resident herds of sable. (Fig. xxix). The southern limit of their distributional range within the Lowveld during historical times was the Komati River. (Fernandes das Neves, 1879).

Feeding habits : Grazing and some browsing.

Breeding : A well-defined calving period extending from late January to the middle of March.

Most recent estimation of numbers : South of the Sabi River 180-200. Central district 340-360. North of the Olifants River 560-580. Total 1,080-1,140.

Damaliscus lunatus lunatus Burchell.

Tsessebe.

Tsessebe were still of common occurrence in the Pretoriuskop area and on the Lebombo flats south of Sabi River during the 'eighties' of the previous century. (Glynn, 1926; Vos, 1890). Their numbers were however so seriously decimated by hunters that the few small herds remaining in the area south

of the Sabi between Paben and Mtsawu and in the Randspruit zone, could not maintain themselves and the last survivors were seen during 1937.

In the central district the progressive infestation of a favourite habitat by the unpalatable grass, *Bothriochloa insculpta,* had a detrimental effect on the local tsessebe population, eventually causing their evacuation from this area and a south-easterly migration to the Mlondozi area where substantial herds are found today in a more favourable habitat. A few scattered herds also remain in the mixed *Combretum* savanna woodland which covers the western half of the central district.

The bulk of the tsessebe population of the Kruger Park is located north of the Letaba River however, and local herds are progressing favourably in both the eastern and western zones. (Fig. xxx).

Feeding habits : Selective grazing and very little browsing.

Breeding : The calving season starts during mid-September and extends to the first or second week in November.

Most recent estimation of numbers : Central district 100-120, north of the Letaba River 500-550. Total 600-670.

Connochaetes (Gorgon) taurinus taurinus Burchell.

Blue Wildebeest.

Apart from impala, blue wildebeest is at present the most common and prolific ungulate species in the Kruger National Park. Their rapid increase in numbers in certain parts of the central district has already caused considerable trampling out and overgrazing of the habitat, particularly in the area adjoining the western boundary after completion of the game fence, and various methods are being considered to effect a mass translocation of excessive animals to understocked areas north of the Olifants River.

The central district supports the vast bulk of the wildebeest population, which includes great migratory herds in the western as well as eastern zones, all of which exhibit well defined and rythmical seasonal movements, concentrations and dissemination.

The long grass veld of Pretoriuskop area was an important wildebeest habitat south of the Sabi River but the progressive encroachment of tall thatch grass, *Hyparrhenia dissoluta,* rendered the area unsuitable and large numbers were lost from this area. A policy of biennial rotational burning which had been implemented during recent years has improved conditions in this habitat and the local wildebeest population has reacted favourably. Considerable numbers inhabit the southern Lebombo flats and smaller herds are scattered through the remainder of the district.

The northern mopani veld never carried a large wildebeest population, but recent indications are that the resident herds here are also slowly increasing in numbers. (Fig. xxxi).

Feeding habits : Primarily grazing with very little browsing. Very partial to burnt veld.

Breeding: The calving season extends from the last week of November to the end of January. During drought periods particularly, young calves have been recorded also during the months February-May. Single young per birth, perhaps rarely twins.

Most recent estimation of numbers: 14,500-14,600 of which about 13,000 inhabit the central district, and some 600 are found north of the Olifants River.

Tragelaphus scriptus sylvaticus Sparrman.

Bushbuck.

An inhabitant of riparian and the light montane forests and overgrown valleys in the Kruger National Park. Usually solitary, but may be in two's and three's, or even small family groups. They are not particularly common anywhere and are not often seen, in view of their timid disposition and the overgrown nature of their chosen environments. Bushbuck are most often encountered along the Sabi and Levubu riverine forests, the mountainous area around Punda Milia and west of Malelane, and in the long grass veld around Pretoriuskop. (Fig. xxxii).

Feeding habits: Primarily browsing and some grazing.

Breeding: Young lambs have been recorded during July, October and November and Stevenson-Hamilton (1947) sets the breeding season as from October to February for this species.

Most recent estimation of numbers: 700-800. May be appreciably higher.

Tragelaphus (Nyala) angasi Gray.

Nyala.

Primarily an inhabitant of the southern tropical littoral and its presence within the boundaries of the Kruger National Park only became known in 1929, when a small troop was discovered in the gallery forest along the Levubu River at Pafuri. So well has the species adapted itself to local conditions however, that it has in the relatively short span of 30 years colonised the whole of the Levubu riparian forest, the montane forests and valleys around Punda Milia and on Dzundwene hill and the Nyandu bush. The riparian forests along the Shingwidzi-, Mphongolo- and Great Letaba Rivers have also been infiltrated and today boast with substantial populations. The *Androstachys* forests north and immediately south of the Olifants Gorge have also become a favourite habitat of these beautiful creatures and they are regularly encountered along the lower reaches of the Bangu spruit. (Fig. xxxiii).

Feeding habits: Delicate browsing in shaded environs and some grazing.

Breeding: The lambing season extends from July to November with a peak during August-October. Young lambs have been recorded at Pafuri during April and May.

Latest estimation of numbers: 600-650 (possibly more), of which some 50 occur south of the Olifants River in the Gorge area.

Tragelaphus strepsiceros strepsiceros Pallas.

Kudu.

A ubiquitous and adaptable ungulate species with no specialised habitat preferences, and widely distributed throughout the Park. (Fig. xxxiv). In certain areas it is exceedingly common — to a degree of becoming the dominant member of the local ungulate communities. Kudu are able to survive prolonged periods without water, and are often encountered considerable distances from permanent water during the dry season. They are however, very susceptible to epizootic diseases such as rinderpest and anthrax and the population north of the Olifants River suffered a severe setback during the serious anthrax outbreaks of 1959 and '60. (Pienaar, 1960, 1961).

Feeding habits: Non-selective browsing and a little grazing.

Breeding: The calving season commences early in January and extends to late February. Young calves have been recorded during November.

Latest estimation of numbers: 5,500-6,000 (probably more). More than 700 were lost during the anthrax epidemics of 1959-'60, north of the Olifants River.

Taurotragus oryx oryx Pallas.

Eland.

Eland were at one time widespread and abundant along the Drakensberg foothills and on the Pretoriuskop flats (Glynn, 1926), but unfortunately also a trophy of the chase much in demand by native and pioneer white hunters. Their numbers had therefore already been sadly reduced at the turn of the century when the great rinderpest epidemic of 1897-98 swept through the Lowveld and wiped out the remaining eland. The last survivor south of the Sabi was shot in the Barberton district in 1897 (Yates).

A few eland survived in the country south of the Olifants River to the west of the present western boundary of the Park, and to this day scattered small herds roam on the private farms Rietvlei, Nederland, Ceylon, Rotshay and Addger.

North of the Olifants River eland were accepted as extinct by the Warden in 1902. Fortunately, however, some eland escaped the depredation of the rinderpest epidemic and survived in the vast sandveld country in Portuguese East Africa along the eastern boundary of the old Shingwidzi Reserve, from where they re-entered the Park.

In 1905 rumours circulated that an eland cow had been seen running with a herd of impala near Shingwidzi, but it was not until 1920 that the first small eland herds were again encountered by European rangers in the northern districts. The first immigrants obviously found the country west of

the Lebombos to their liking, and have steadily increased in numbers through the years, contributing to the flourishing eland population of the northern district, which is at present still growing from strength to strength. Except for the mountainous area north and east of Punda Milia and the relatively waterless country between the Shipikane and Tsende Rivers, eland have colonised most of the remaining area north of the Letaba River. Mixed breeding herds numbering as many as 100 and more are today not infrequently encountered in both the western zone and on the Babalala- and Tsende flats. Their numbers fluctuate seasonally with migratory herds crossing to and fro from the adjoining Portuguese territory.

A lone eland cow crossed the border from Mocambique south of Nwanetzi River during June 1961 and has been seen on several occasions since in the Mbadze-Makonkolwine block. (Fig. xxxv).

An attempt will be made to re-introduce eland into both the central and southern districts from the north within the next few years.

Feeding habits: Browsing of coarser kind and some grazing. May go without water for long periods.

Breeding: Available records indicate a prolonged calving season which extends from May to November with a definite peak during August and September. Calves may however, be born throughout the year.

Latest estimation of numbers: 400-450 (sporadically more during the dry season).

Syncerus caffer caffer Sparrman.

Buffalo.

Stevenson-Hamilton (1925) relates that after the havoc created by the rinderpest epidemic of 1897-'98, there were probably not more than about a dozen buffalo left in the old Sabi Reserve in 1902. Although the buffalo population north of the Olifants River and also that of the central district was largely built up from Portuguese East African immigrants, the great herds which at present roam through most of the Kruger National Park attest well indeed for the inherent recuperative powers of this species after a natural catastrophy. The largest single herd, numbering well over 1,500 animals exist on the Lebombo flats between Lower Sabi and the Crocodile River — a magnificent sight anywhere in Africa today. Many other herds of several hundred individuals up to 800 and more inhabit diverse vegetational environments and practically all types of country throughout the Park, and the population curve is rising steadily. (Fig. xxxvi).

Feeding habits: Coarse grazing and some browsing. Young and old grass grazed equally well.

Breeding: Calving occurs throughout the year with a possible peak during early spring.

Latest estimation of numbers: South of the Sabi River 2,000-2,250; central district 3,600-3,800; northern district 4,000-4,500. Total 9,600-10,550.

RESUMÉ

The distribution of the large mammals of the Kruger National Park is considered. The most important features of the zoogeography of each species are discussed in the light of their specific ecological affinities. Distribution data and locality records compiled over a period of five years are presented in a series of distribution maps, and an indication of the present-day status of each species, based on population data accumulated over a long period, is provided.

ACKNOWLEDGEMENTS

The author wishes to thank all who contributed in compiling the distribution data presented in this paper, and here particularly the valuable aid and suggestions of the members of the biological and ranger staff of the Kruger National Park.

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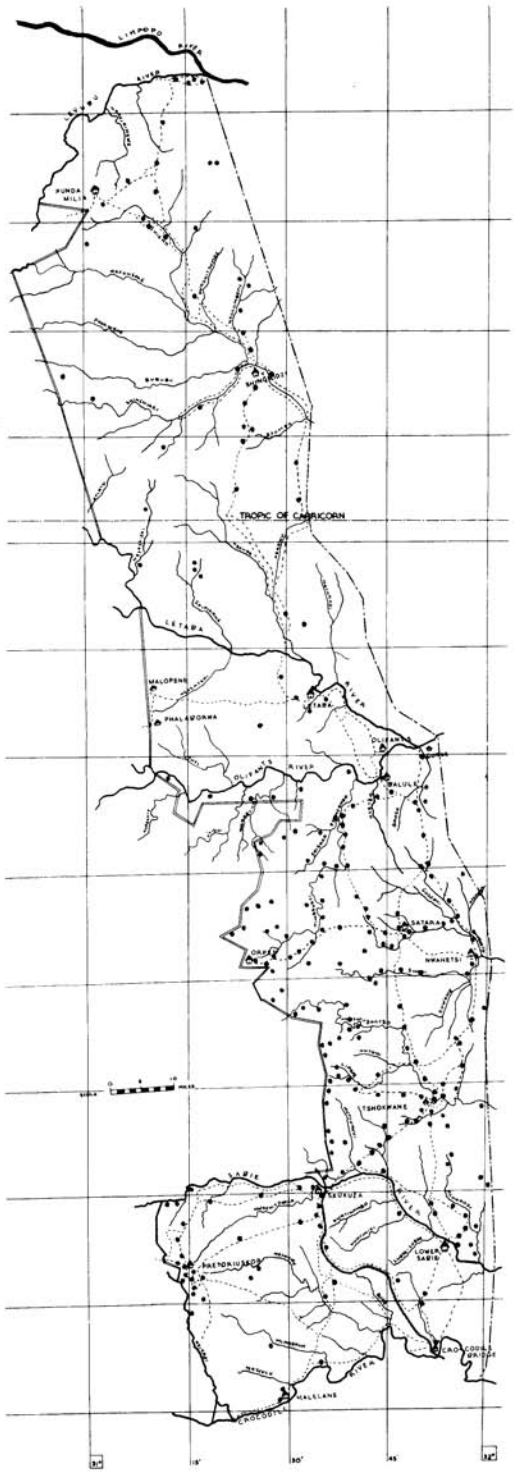

FIG. 2. *Canis mesomelas mesomelas* Schreber.

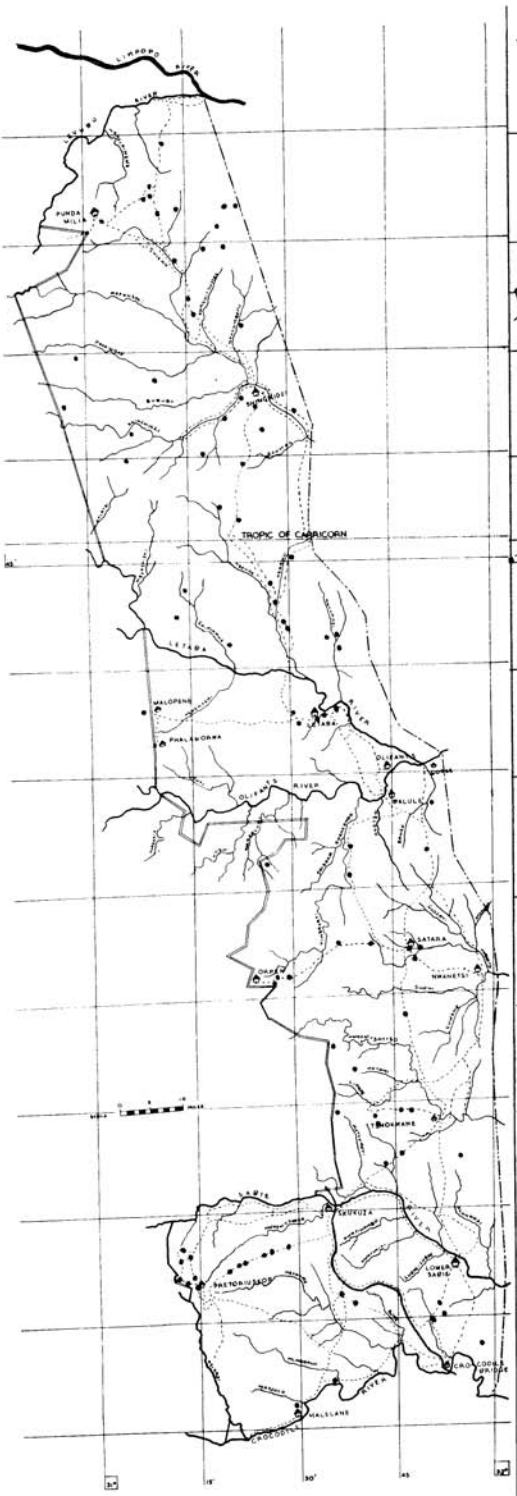

FIG. 3. *Canis adustus adustus* Sundevall.

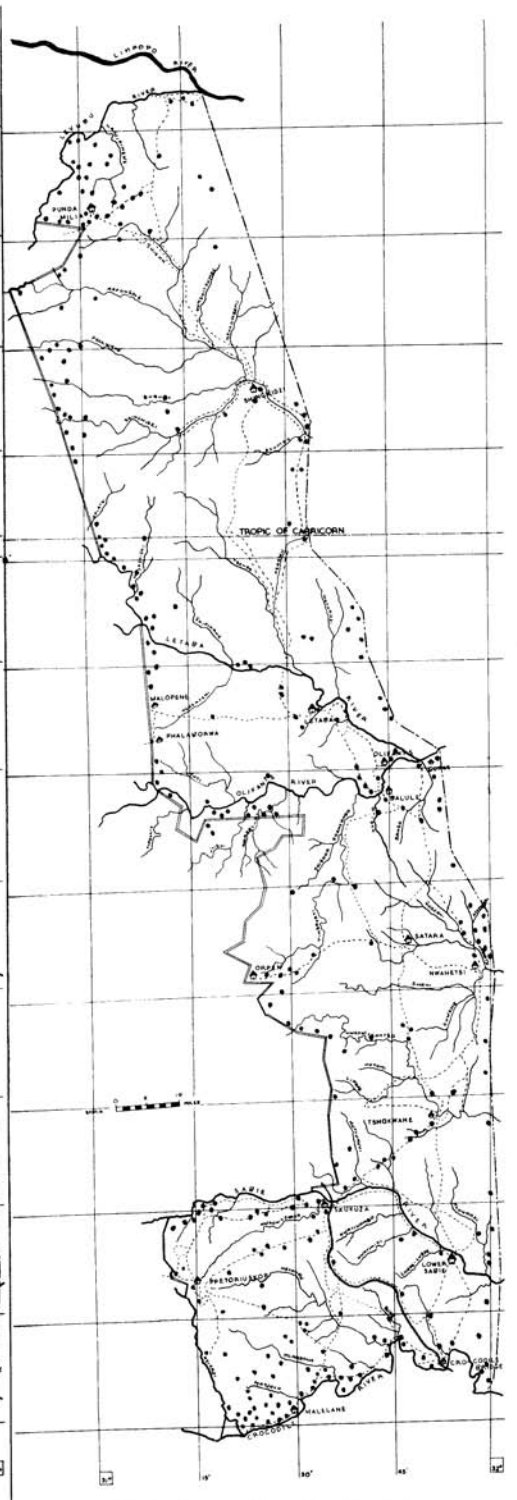

FIG. 4. *Lycaon pictus pictus* Temminck.

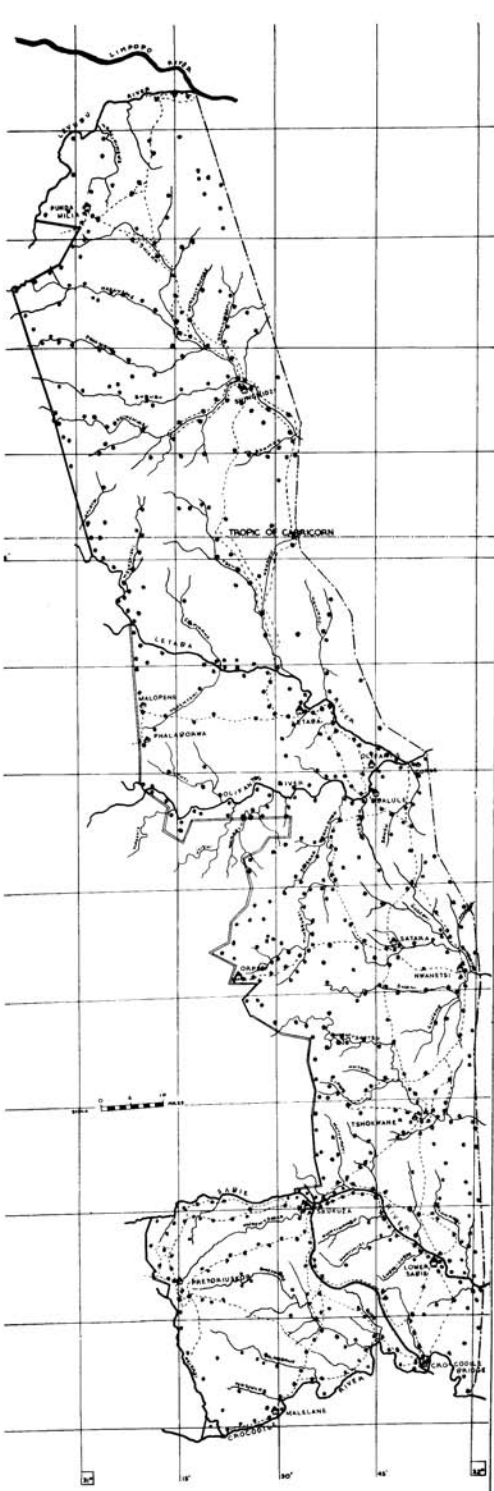

FIG. 5. *Crocuta crocuta* Erxleben.

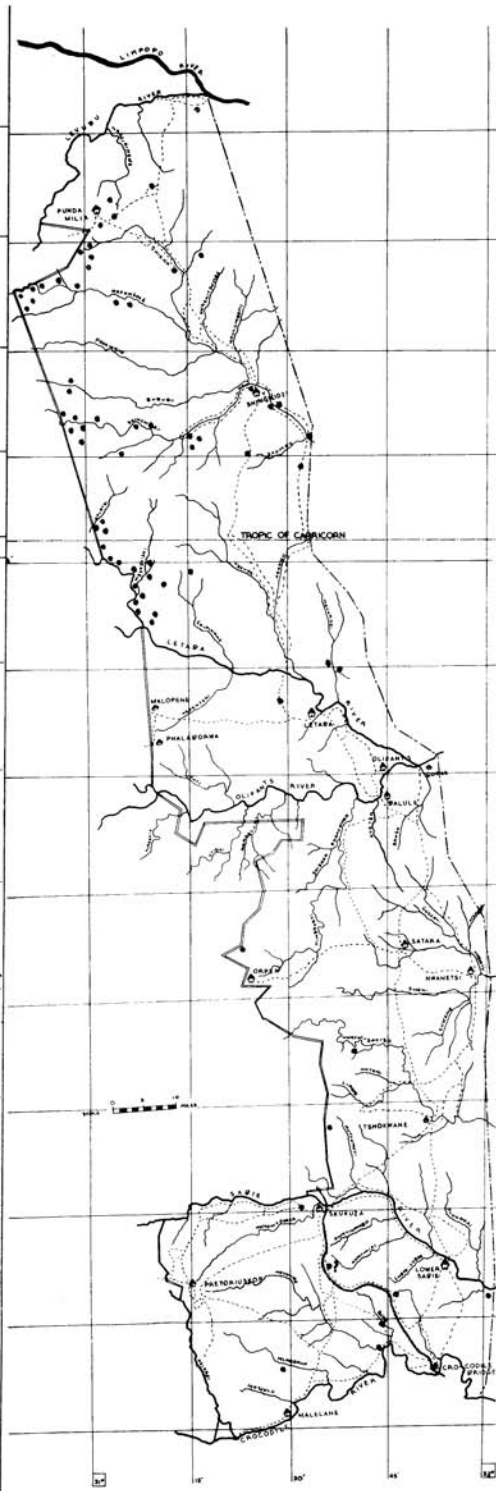

FIG. 6. *Hyaena brunnea* Thunberg.

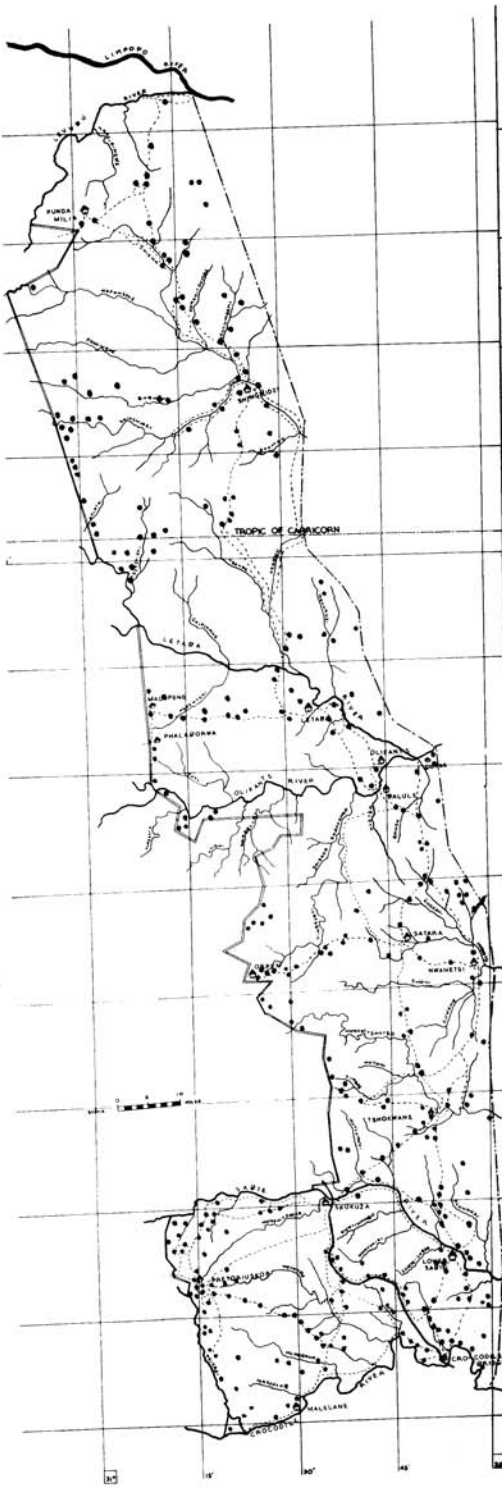

FIG. 7. *Acinonyx jubatus jubatus* Schreber.

FIG. 8. *Panthera pardus* Linnaeus.

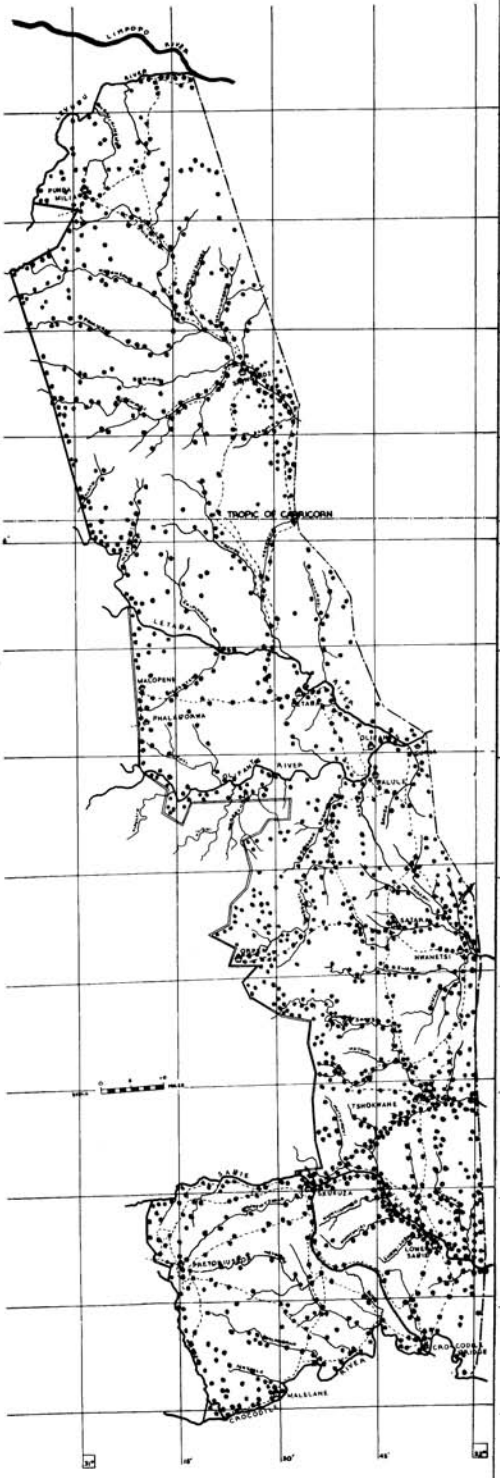

FIG. 9. *Panthera (Leo) leo krugeri* Roberts.

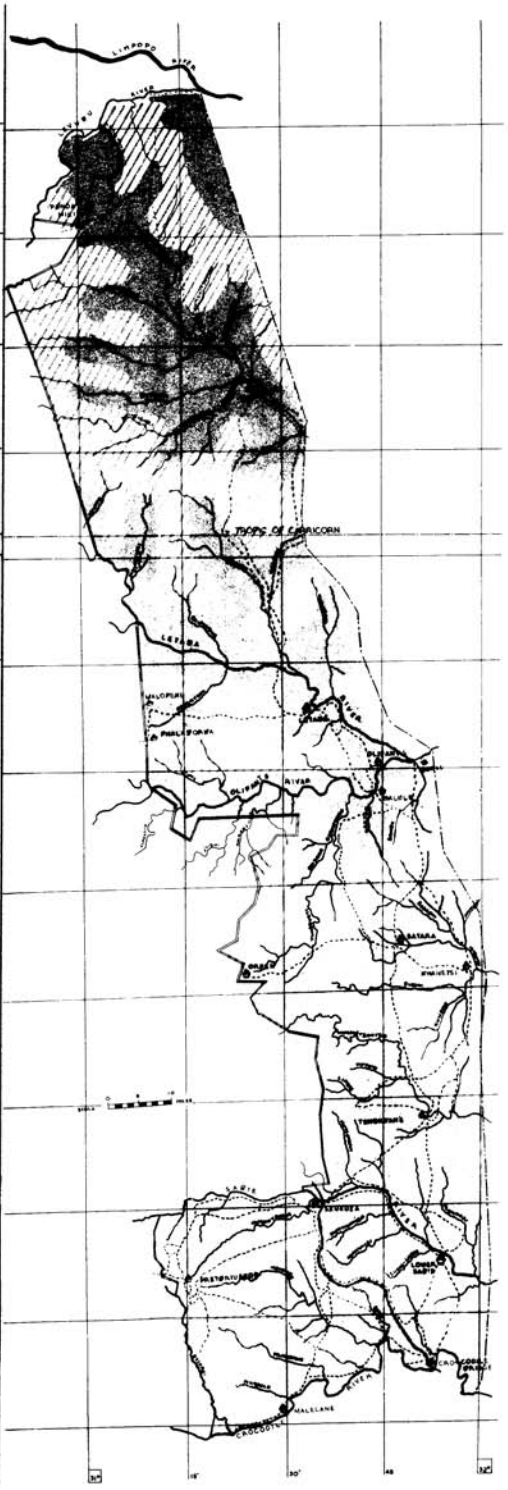

FIG. 10. *Loxodonta africana africana* Blumenbach.

FIG. 15. *Hippopotamus amphibius* Linnaeus.

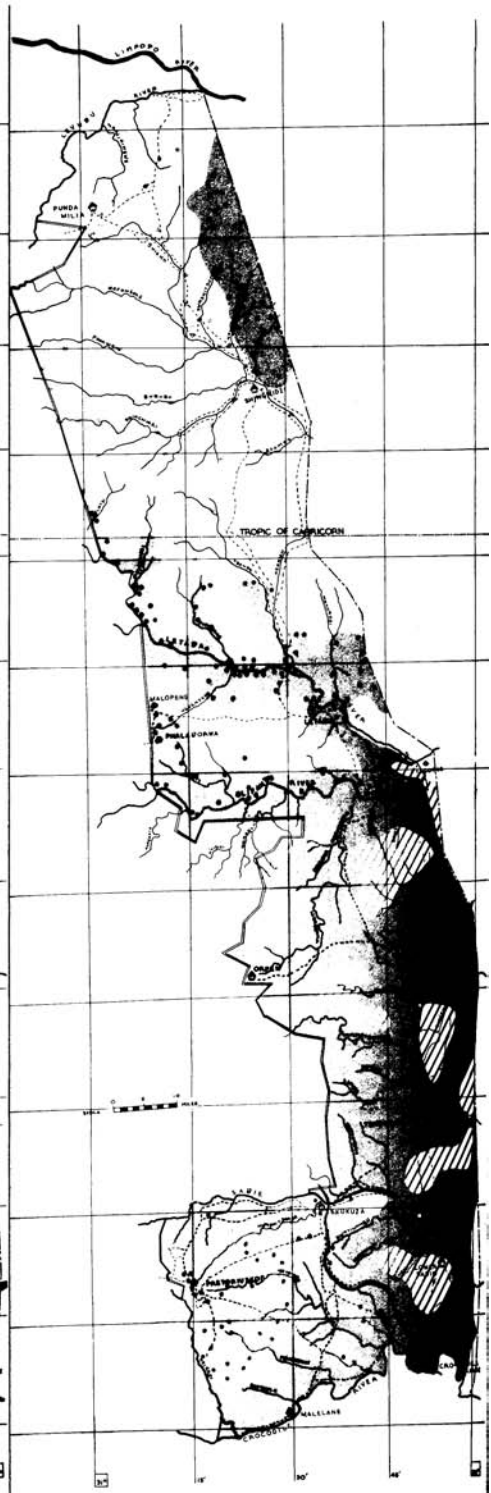

FIG. 16. *Giraffa camelopardalis wardi* Lydekker.

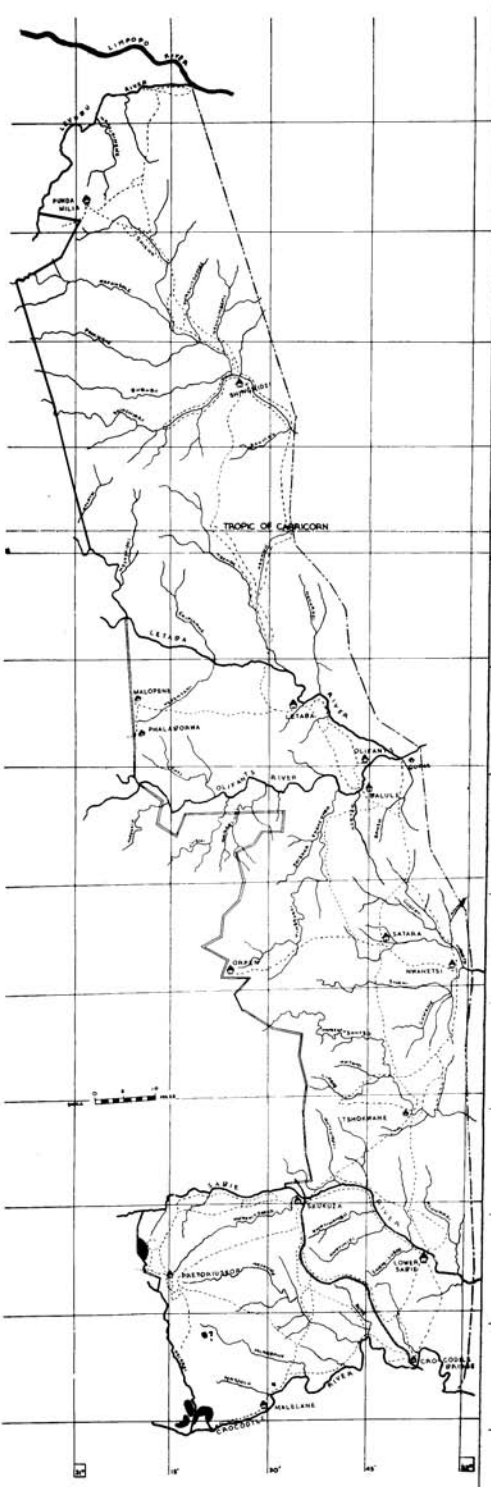

FIG. 17. *Cephalophus natalensis amoenus* Wroughton.

FIG. 18. *Sylvicapra grimmea caffra* Fitzinger.

FIG. 19. *Raphicerus campestris zuluensis* Roberts.

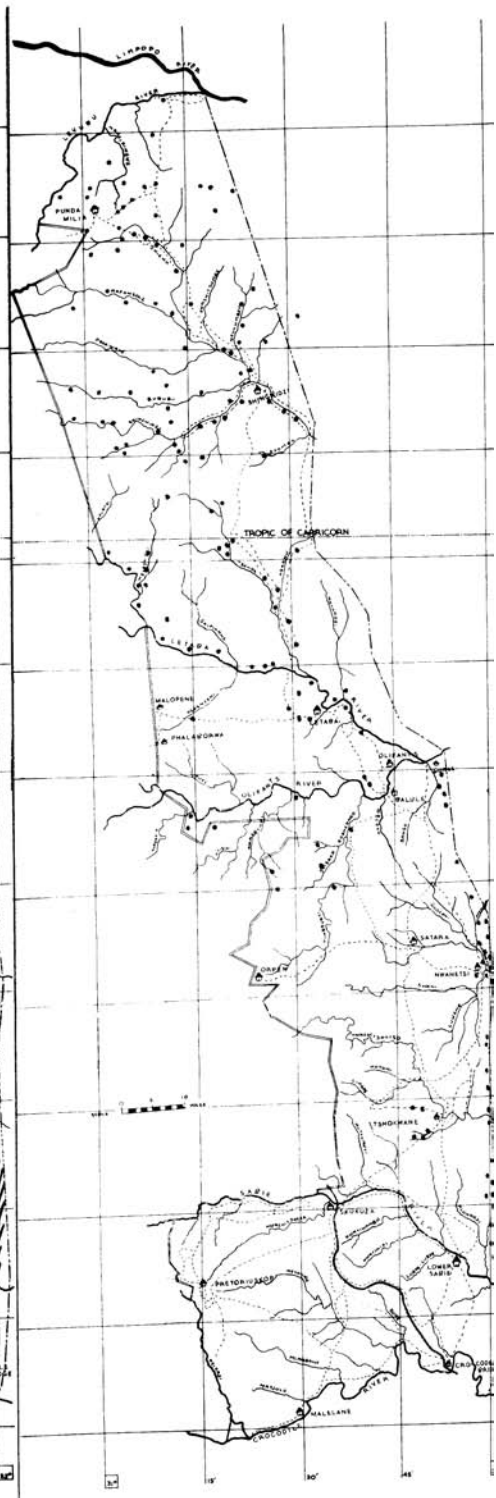

FIG. 20. *Raphicerus sharpei colonicus* Thomas & Schwann.

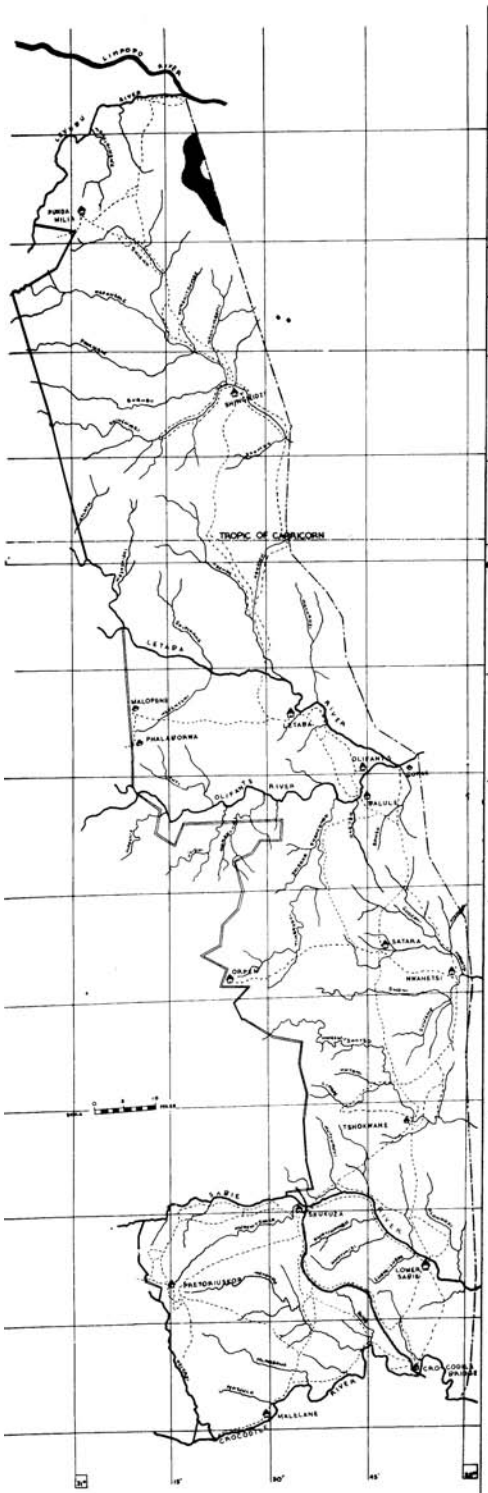

FIG. 21. *Nesotragus moschatus zuluensis* Thomas.

FIG. 22. *Ourebia ourebi* Zimmerman.

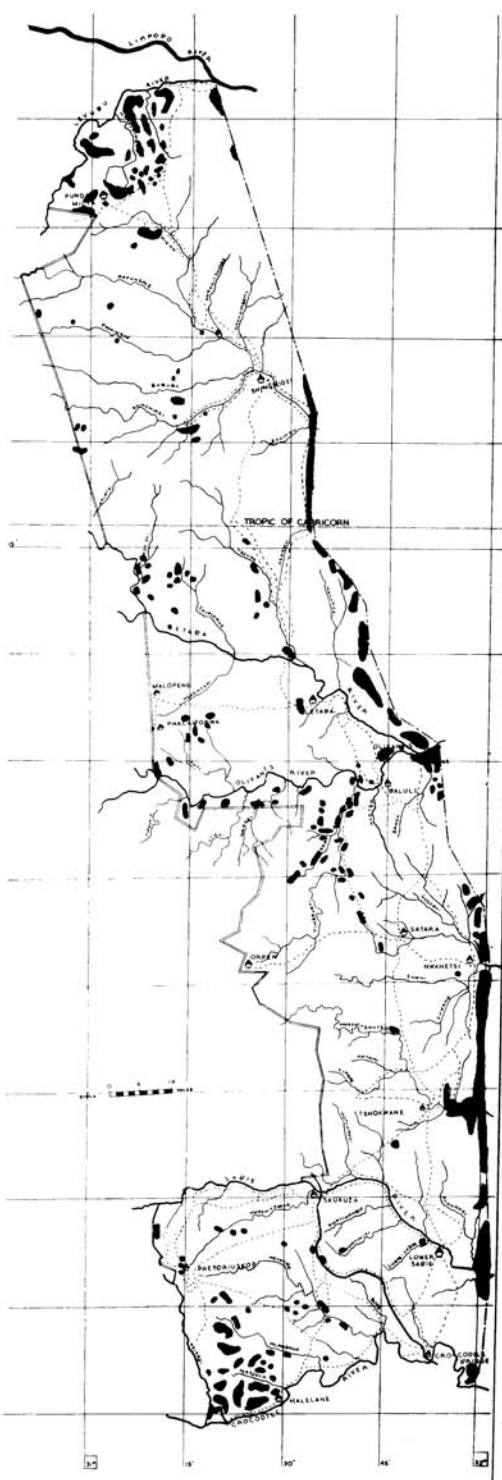

FIG. 23. *Oreotragus oreotragus transvaalensis* Roberts.

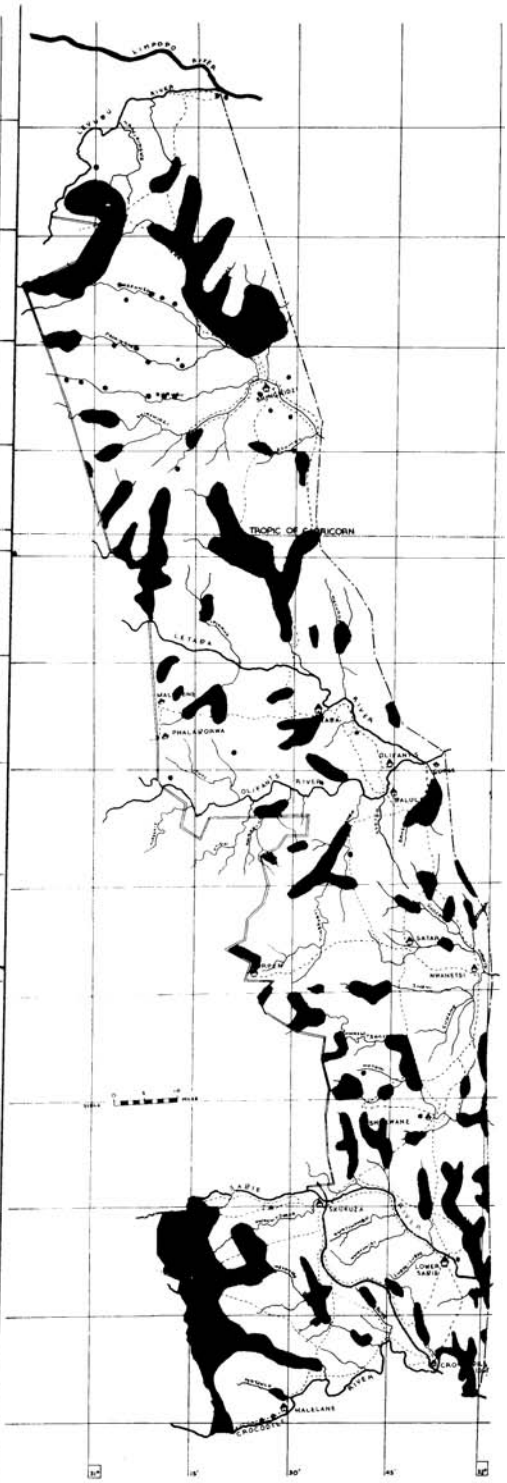

FIG. 24. *Redunca arundinum arundinum* Boddaert.

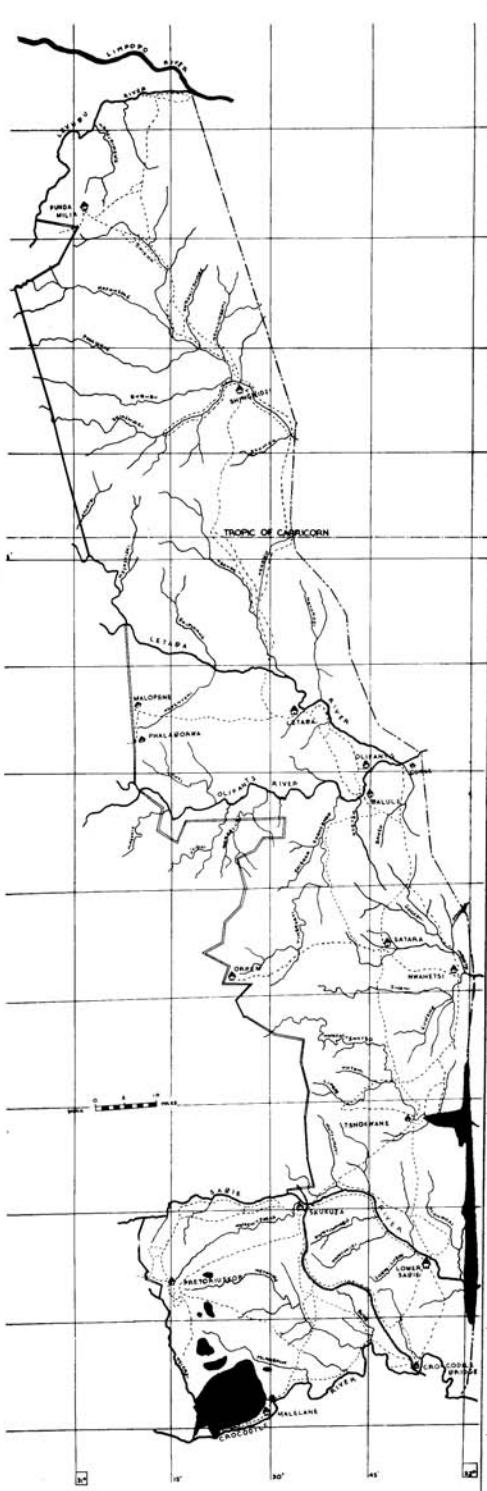

FIG. 25. *Redunca fulvorufula fulvorufula* Afzelius.

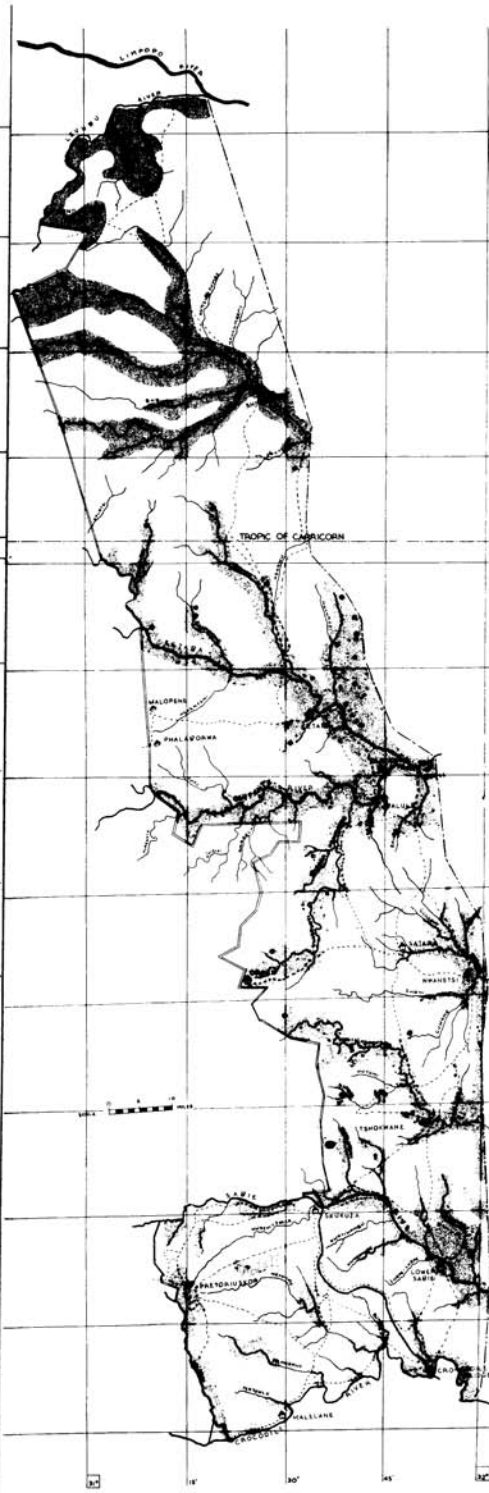

FIG. 26. *Kobus ellipsiprymnus* Ogilby.

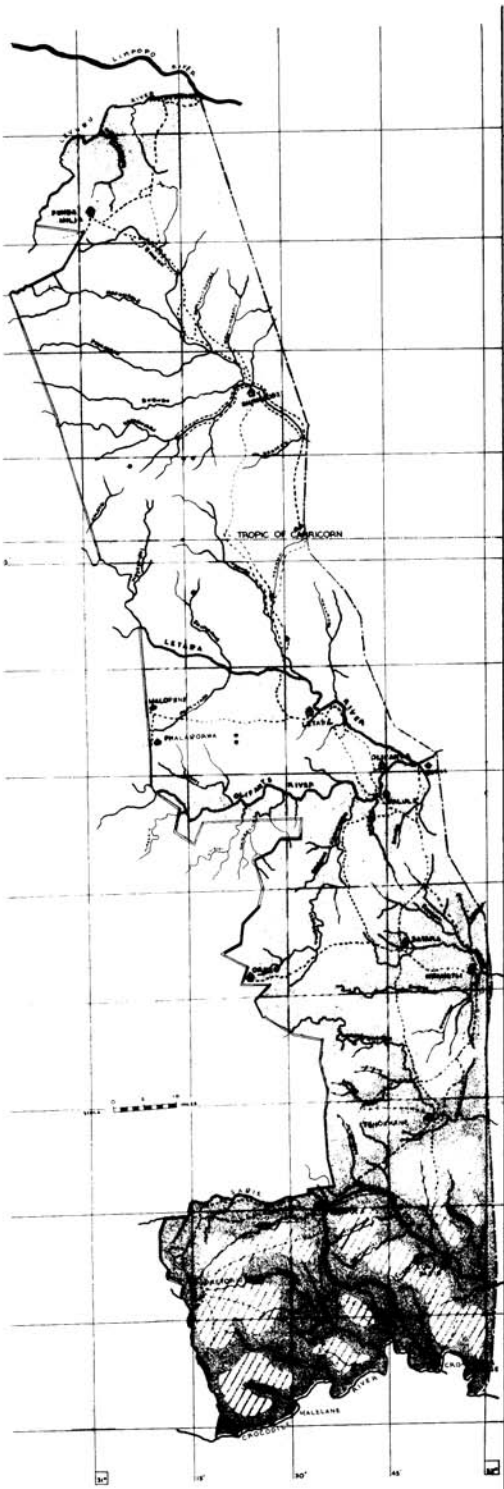

FIG. 27. *Aepyceros melampus melampus* Lichtenstein.

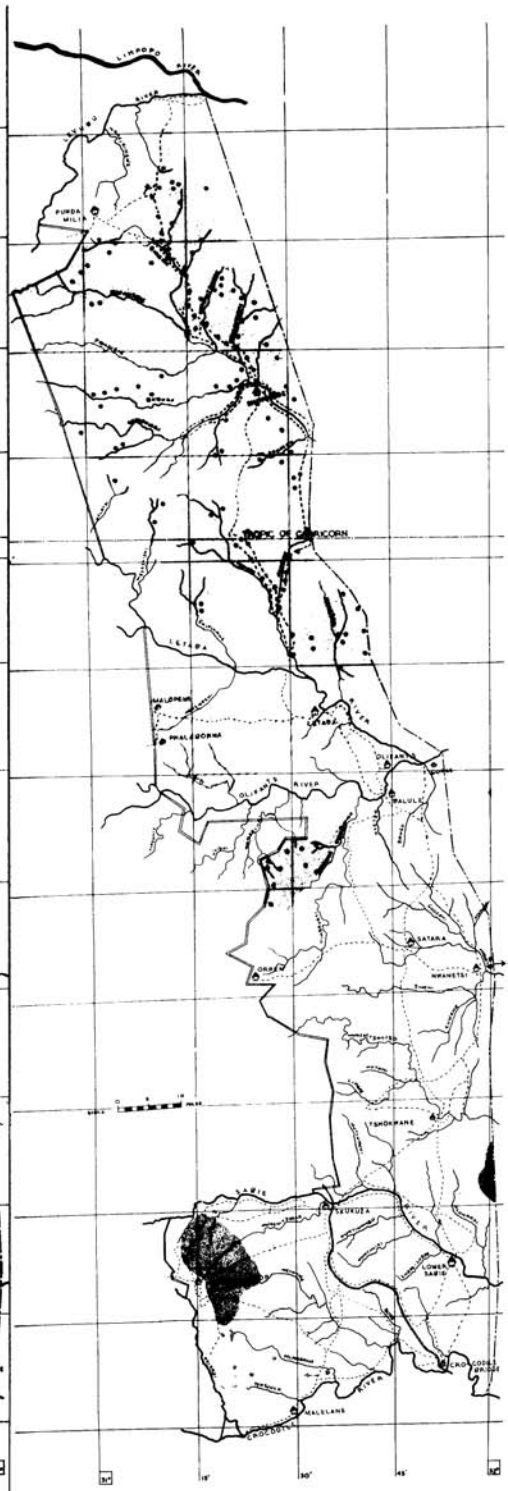

FIG. 28. *Hippotragus equinus equinus* Desmarest.

FIG. 29. *Hippotragus niger niger* Harris.

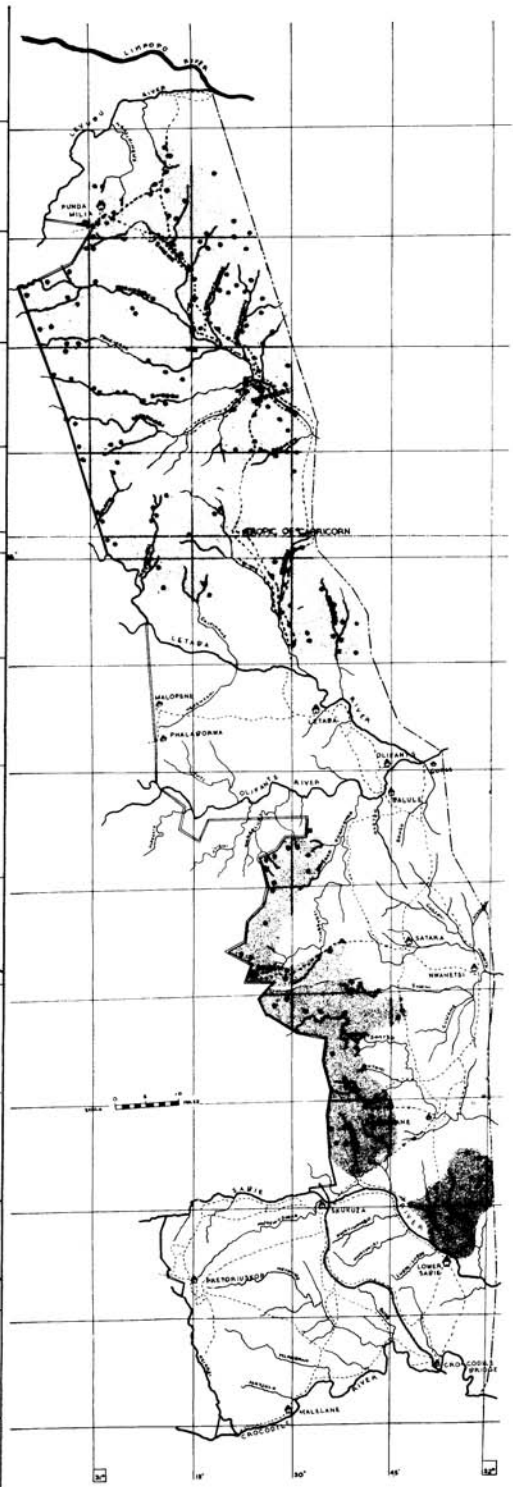

FIG. 30. *Damaliscus lunatus lunatus* Burchell.

FIG. 31. *Connochaetes (Gorgon) taurinus taurinus* Burchell.

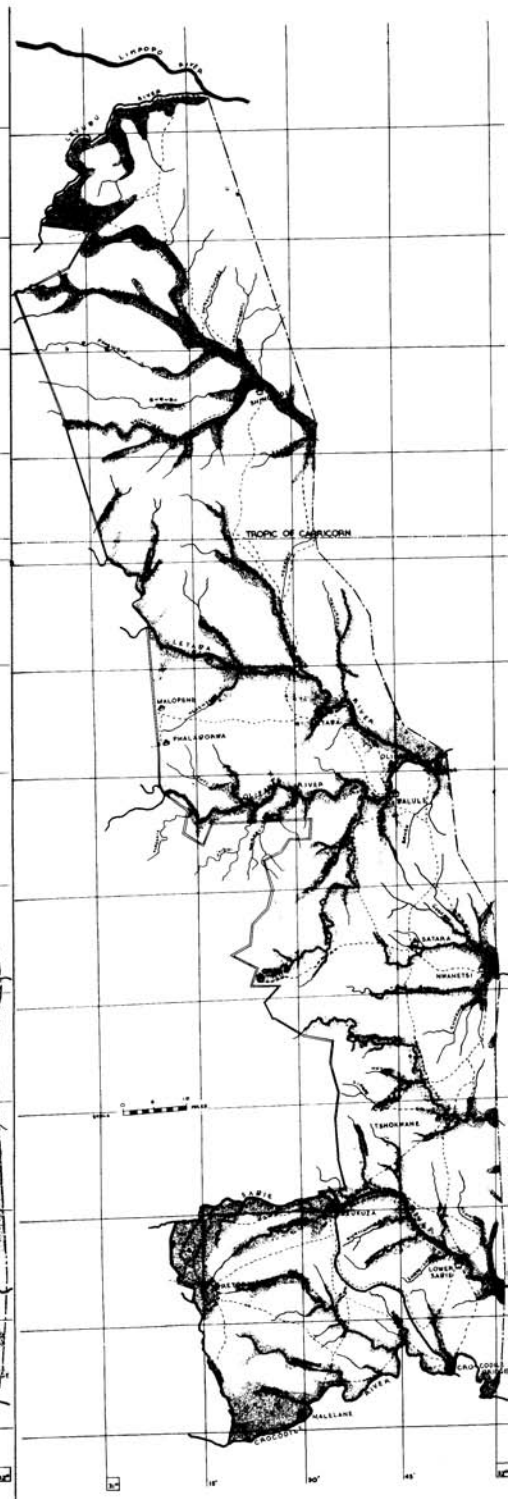

FIG. 32. *Tragelaphus scriptus sylvaticus* Sparrman.

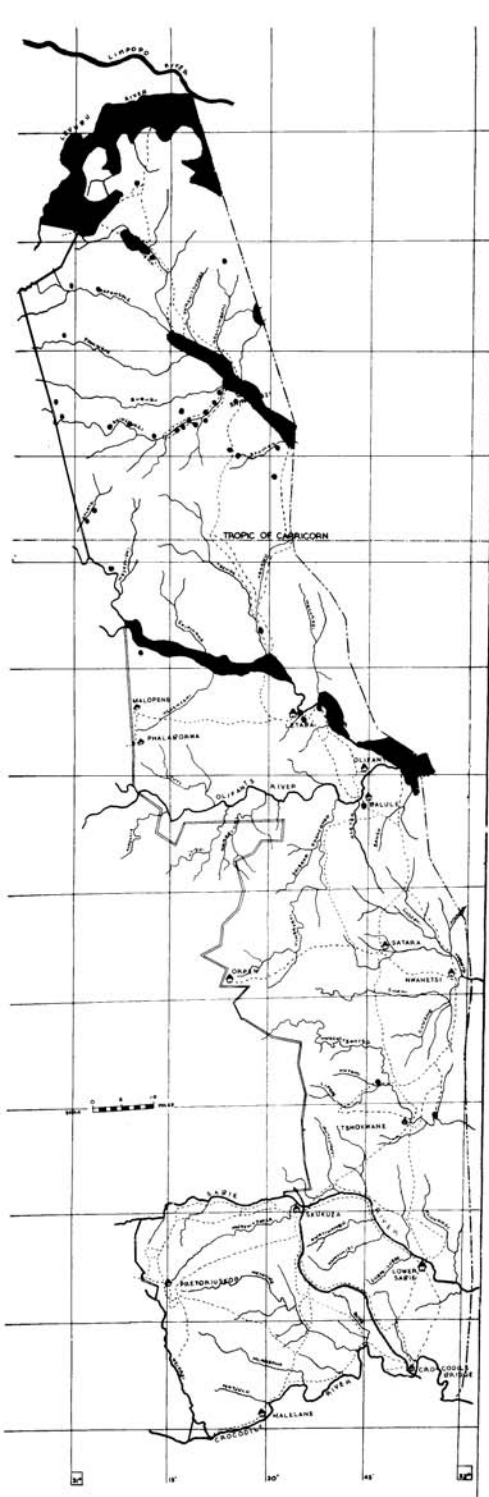

FIG. 33. *Tragelaphus (Nyala) angasi* Gray.

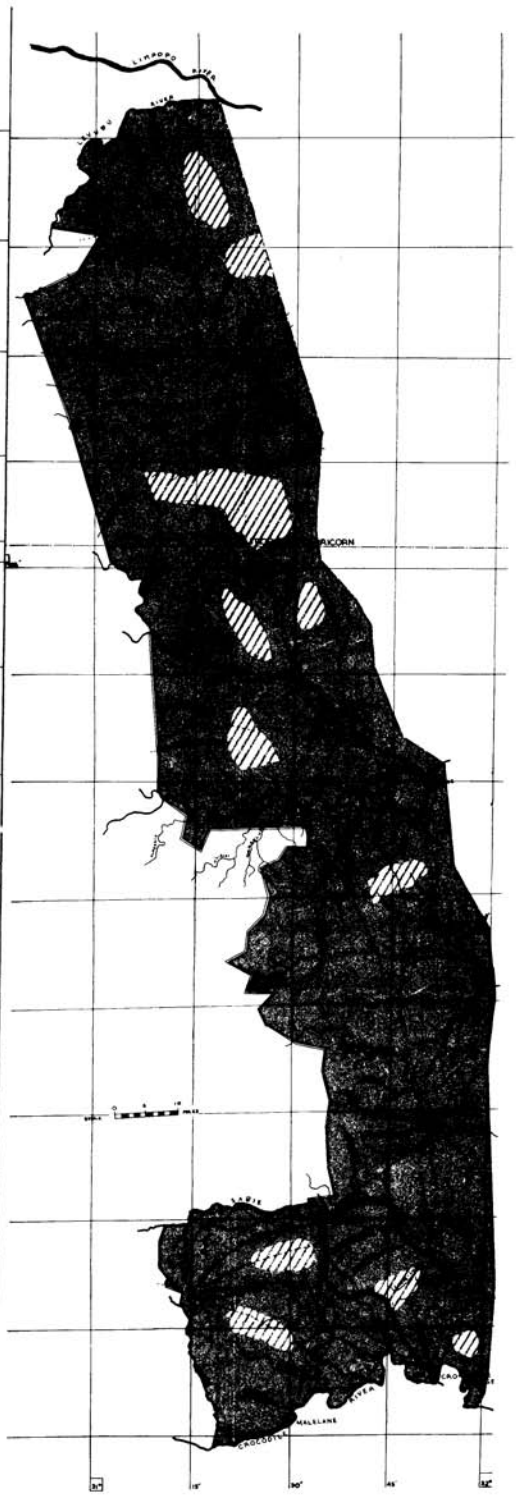

FIG. 34. *Tragelaphus strepsiceros strepsiceros* Pallas.

FIG. 35. *Taurotragus oryx oryx* Pallas.

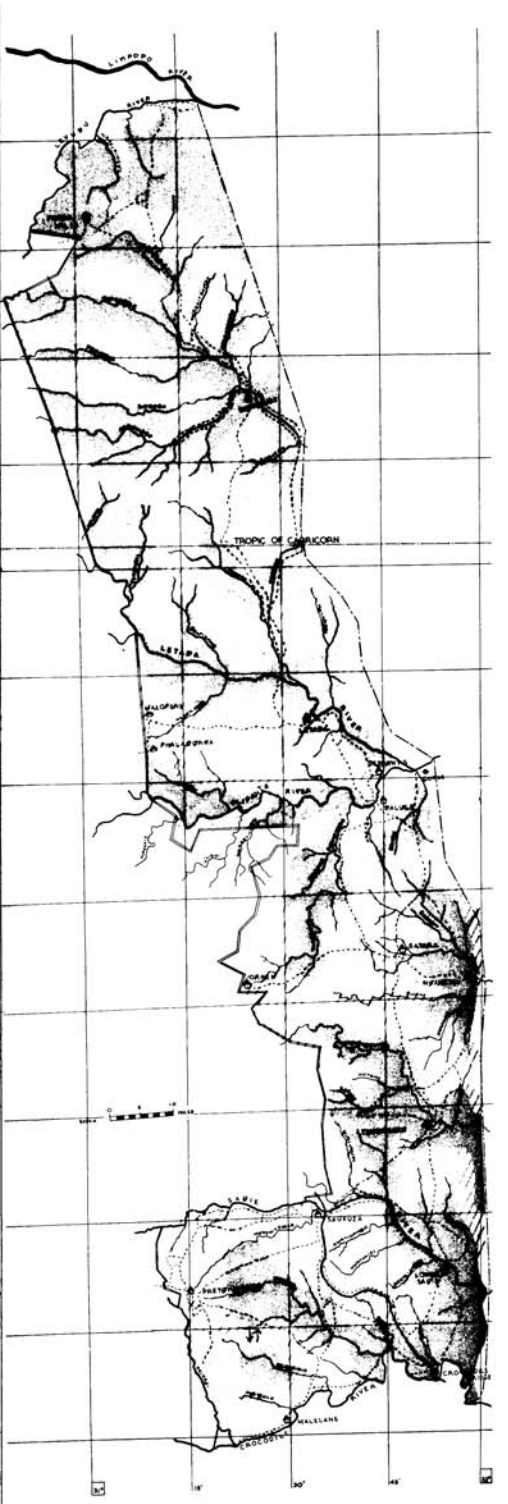

FIG. 36. *Syncerus caffer caffer* Sparrman.

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